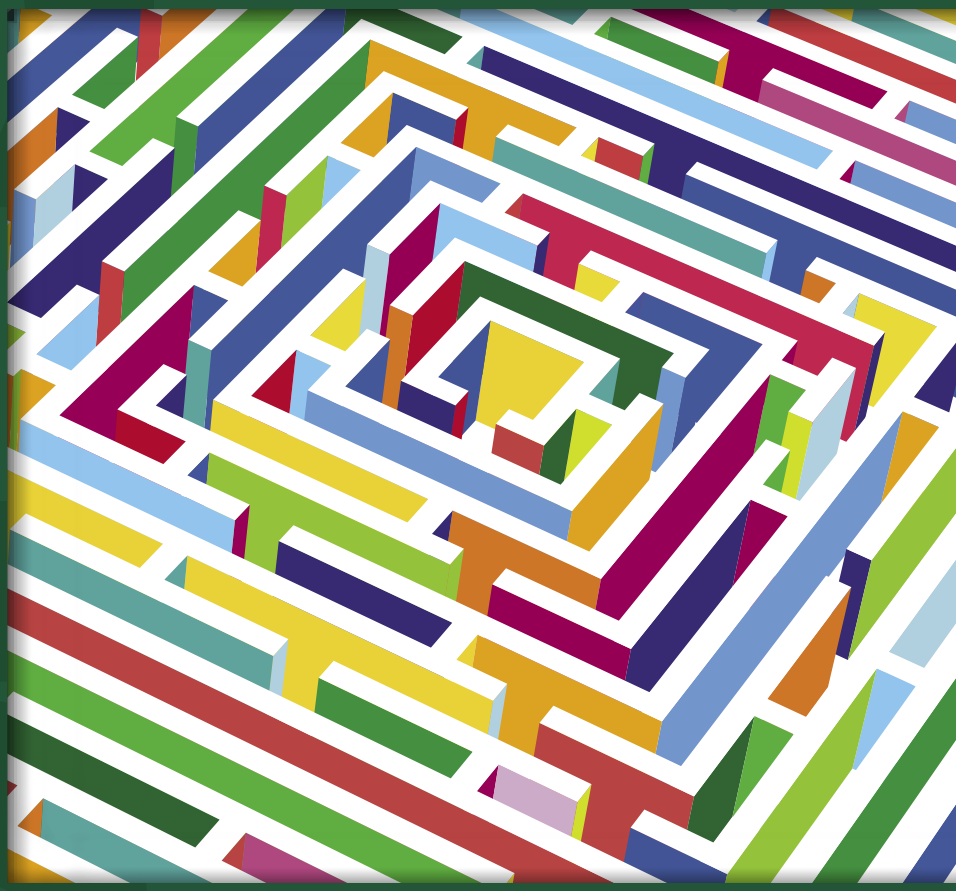
JOURNAL OF BEHAVIOURAL ECONOMICS AND SOCIAL SYSTEMS

Volume 3, Number 1, 2021



gap | TCG

GLOBAL ACCESS PARTNERS

Global Access (GAP) is an independent not-for-profit institute for active policy that initiates strategic debate on the most pressing social, economic and structural issues facing Australia and the world today. It acts as a catalyst for policy implementation and new economic opportunities.

GAP promotes collaborative, multidisciplinary approaches to solving complex issues through the Second Track process. In contrast to other think tanks, it focuses on practical outcomes and the 'how' and 'who' of project delivery.

Our biggest asset is our network of over 4,000 Australian and international members. More than 1,000 people are engaged on various GAP projects at any one time. Over 120 partners have supported GAP's activities since its inception. These include federal and state governments, major corporates, peak industry and community bodies, universities and research institutes.

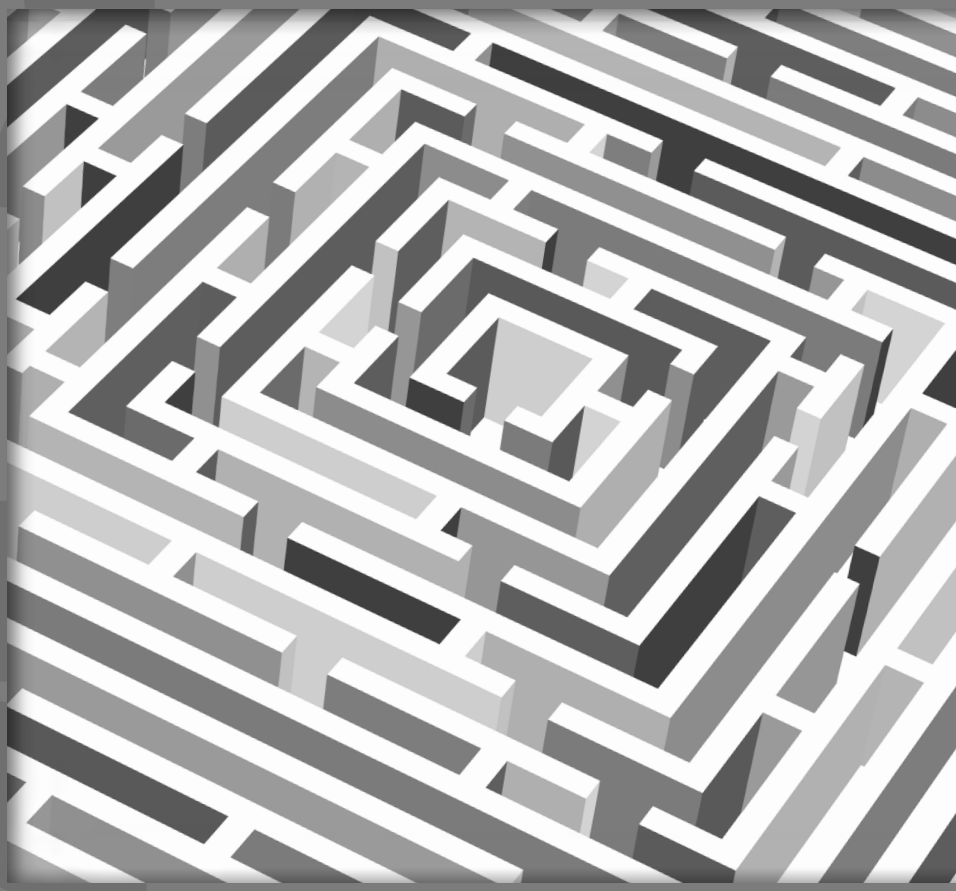
GAP runs national and international conferences, multidisciplinary taskforces and executive roundtables, coordinates community and stakeholder research projects and feasibility studies, and oversees pilot projects to trial new business ideas.

Established in 1997, GAP is a member of TCG Group – a diverse and growing network of Australian-owned companies founded in 1971.

www.globalaccesspartners.org

JOURNAL OF BEHAVIOURAL ECONOMICS AND SOCIAL SYSTEMS

Volume 3, Number 1, 2021



gap | TCG

All information is current as of May 2021

First published 2021

Published by:
Global Access Partners Pty Ltd
24-30 Wellington Street, Waterloo NSW 2017 Australia

Journal of Behavioural Economics and Social Systems (*BESS*™)
Volume 3, Number 1

ISSN 2652-290X (Online)
ISSN 2652-2896 (Print)

PREFACE

COMPLIANCE AND CREATIVITY

> 'Imagination is the beginning of creation. You imagine what you desire, you will what you imagine, and at last, you create what you will.' – George Bernard Shaw[1]

Businesses, organisations and governments around the world tend to operate through traditional 'first track' processes which emphasise hierarchical power structures. These demarcations tend to inhibit the free flow of information from 'on the ground' operatives to high-level decision makers, delaying the perception of problems and therefore the discussion and implementation of solutions to remedy them.

Rigid jurisdictional boundaries prevent stakeholders cooperating to address complex problems which cut across bureaucratic boundaries, and the defence of internal vested interests means that innovative policies are not embraced to optimise the common good. This means organisations lack effective avenues for people to 'tell truth to power, and even when consultation is undertaken,

1. Shaw, 1921

employees are inhibited from speaking openly and honestly because they feel obliged to tailor their comments to the perceived and actual expectations of their superiors.

A recent report from the McKinsey Institute[2] found the most serious losses and cost overruns in both small and major projects occur when people are afraid to report incipient failure at an early stage. They prefer to play safe and wait for others to raise the alarm, without calling attention to themselves. When repeated in innumerable cases, this hesitancy can have an enormous cumulative impact on the corporate world and the whole of society.

If someone feels their personal livelihood is at risk if they share 'bad news', they are more likely to suppress it, meaning that genuine problems are allowed to fester and incur much greater costs, or even catastrophic failure, to the whole organisation later on. In the absence of criticism or alternative viewpoints, high-level decision making can become flawed with expensive consequences, as evidenced by the findings of Global Access Partners' complex project management project.[3]

Traditional 'first track' processes in government and public administration therefore encourage compliance with existing norms.[4] By defending, rather than challenging, the status quo, they tend to perpetuate existing policies and procedures regardless of their real-world outcomes.

Effective policy formation demands a more agile response to long-standing 'wicked' problems and fast-emerging challenges, and complementary approaches, such as the Second Track,[5] offer a safe space for talented, experienced and diverse experts to explore fresh solutions in a timely and cost-efficient way.

COMPLIANCE

The traditional model of public administration developed in Britain and Germany relies on political and administrative segregation, stable hierarchies and top-down control. As articulated by Max Weber,[6] these principles allowed government to become a driving force of economic and social progress for much of the 20th century. However, a sense of stagnation in the late 1970s provoked a wave of privatisation and new forms of public management,[7] which again need refreshing.

Just as large firms and whole industries have been swept away by technology-focused start-ups or foreign competition in the last 20 years,[8] so public departments risk becoming irrelevant if they continue to apply old methods to solve new or intractable problems. Merely privatising or decentralising these problems will not dispel them, but the large size and rigid structures of traditional public departments remain too cumbersome in today's era of instant communication and our knowledge, rather than production, based economy.

Better ways of optimising human resources must be found, and the Second Track builds on findings from social science and neurobiology to improve the way individuals interact in groups to generate and implement imaginative and effective solutions.

Government and politicians routinely call on individuals, organisations, and society to reform in the face of change without examining or reforming their own practices,[9] and a collective, if unspoken,

2. McKinsey, 2018
3. Bodrova, 2019
4. Pfiffner, 1999
5. Global Access Partners, 2021
6. Weber, 1992
7. Green, 1999
8. Inter-American Development Bank, 2018
9. Triffitt, 2018

fear of personal failure underlies the reluctance of people in large organisations to think differently and move quickly. Organisations exist to do what they have always done, the status quo is easier to defend than reform, and nobody is fired for agreeing with their superiors or following long-established practice, however ineffective it may be.

Several famous studies have explored a range of issues related to compliance, conformity and obedience. The Asch Conformity Experiments[10] showed that most individuals will bow to group pressure and accept a clearly wrong answer to a problem rather than dissent, while the Milgram Obedience Experiment[11] revealed the willingness of individuals to set aside morality to obey authority. The Stanford Prison Experiment[12] showed how quickly and completely individuals will conform to expected group roles.

Imaging of brain functions suggests that behavioural change in such situations results from unconscious modifications of low-level perceptual processes, rather than an 'executive' decision to conform.[13] However, even if people consciously align their actions to prioritise group membership over ethics, reason or reality, the phenomena of human 'groupthink'[14] may be so ingrained that it should be leveraged, rather than ignored.

Broadening the 'in-group' and adopting the simple principles of the Second Track in a meeting can make creativity and cooperation, rather than compliance, the group norm to aspire to instead.

CREATIVITY

Behavioural studies which invite subjects to suggest alternative uses for everyday objects[15] tend to highlight our lack of creativity in our everyday lives. We are creatures of habit, minimising risk and effort by mimicking others or repeating experience rather than thinking for ourselves when faced with new situations.

Frameworks which encourage individuals to seek out challenging tasks, broaden their knowledge and surround themselves with interesting people[16] have demonstrated their ability to increase creativity as long as these ideas are captured and acted upon.[17]

Observations of human psychology and experiments in neuroscience demonstrate the considerable cognitive effort required to overcome prior knowledge and current distractions to generate fresh and effective solutions. Creativity requires an amenable physical setting as well as imagination and practicality.[18] Functional magnetic resonance imaging[19] shows the same region of the brain – the seahorse shaped hippocampus[20] – allows us to both reconstruct the past and imagine the future, and therefore generate creative solutions.

However, new ideas must be effective as well as original to be of value, and while relaxing our conscious filters allows our hippocampus and the brain's 'default network' of medial prefrontal cortex, posterior cingulate cortex and angular gyrus to daydream and generate new thoughts, we must

10. McLeod, 2018
11. Cherry, 2019
12. Zimbardo, 1999-2021
13. Morita, Asada and Naito, 2016
14. Psychology Today, 2021
15. Gilhooly et al., 2007
16. Epstein, 2000
17. A study published in *Creativity Research Journal* (Vol. 20, No. 1) on seventy-four city employees from Orange County, California found training in these four skill sets increased the number of new ideas by 55% over 8 months, generating $600,000 in new revenue and saving $3.5 million through innovative cost reductions.
18. Steelcase, 2021
19. Glover, 2011
20. Anand and Dhikav, 2012

also use our brains to evaluate their real-world utility before embarking on a course of action.

Results from cognitive neuroscience reveals this is undertaken by the dorsolateral prefrontal cortex and other regions of conscious cognitive control.[21] Further studies[22] suggest that truly creative people in all walks of life can combine these two key elements of the creative thought process – idea generation and idea evaluation – at the same time like a great jazz musician improvising a fresh but coherent tune.

Second Track groups may therefore prove more effective than traditional meetings because they encourage both the creation and evaluation of a series of ideas in the 'group brain' at the same time, rather than emphasising orthodoxy and unquestioning acceptance. Not every expert in their field is able to simultaneously combine the required elements of creativity and control in their own brains, but a bespoke group can undertake these functions, with individuals accorded equal status in the meeting free to express ideas and opinions at will.

Creating, exploring and evaluating a series of ideas in a free-flowing discussion allows a consensus to emerge around the most promising avenues based on its intrinsic value rather than historic precedent or organisational origin. Diverse individuals in Second Track groups can produce fresh but practical ideas on given issues[23] based on evidence and experience, rather than faith, tradition or vested interest. These ideas would not have been produced by the individuals alone, or through first track approaches, and can prove immensely valuable to participants, interested organisations and society.

Encouraging a creative, rather than compliant mindset, requires more than mere exhortation. Global Access Partners' Second Track process offers a tried and tested method to generate and test new ideas, improving understanding across diverse participants and securing lasting change.

The structure of Second Track discussions allows people at different levels of management to speak as equals in a safe environment, and encourages stakeholders from other organisations to share their knowledge and expertise. People participate as individuals, rather than representatives of particular job roles or interests. Their discussions are minuted without attribution to encourage a free and frank debate, and the lack of strict agendas allows any point of interest to be raised where it may be relevant.

The Second Track allows problems to be identified earlier, and a wider range of solutions to be debated. The economic outcomes of first and Second Track processes may therefore be critically different, with the Second Track both saving money and generating greater productivity. The Second Track may also allow a wider range of individual and group mental processes to come to the fore, leading to more imaginative solutions which cross traditional lines.

Peter Fritz AO
Sydney, May 2021

21. Curtis and D'Esposito, 2003
22. Puccio and Cabra, 2012
23. Global Access Partners, 2021

REFERENCES

Anand, K.S. and Dhikav, V. (2012), Hippocampus in health and disease: An overview; *Indian Academy of Neurology*

Bodrova, O. (2019), Courage and Freedom to Fail. *BESS*™, vol. 1, no. 1, August 2019, https://www.globalaccesspartners.org/publications/Bodrova_GAP_Journal_BESS2019.pdf

Cherry, K. (2019), Milgram's Experiments and the Perils of Obedience, Verywell Mind, https://www.verywellmind.com/the-milgram-obedience-experiment-2795243

Curtis, C.E. and D'Esposito, M. (2003), Persistent activity in the prefrontal cortex during working memory, *Trends in Cognitive Sciences*

Epstein, R., Schmidt S.M. and Warfel, R. (2008), Measuring and Training Creativity Competencies: Validation of a New Test, *Creativity Research Journal*, 20:1, 7-12, DOI: 10.1080/10400410701839876

Epstein, R. (2000), The Big Book of Creativity Games, McGraw-Hill

Gilhooly, K.J., Fioratou, E., Anthony S.H. and Wynn. V. (2007), Divergent thinking: strategies for generating alternative uses for familiar objects, *British Journal of Psychology*

Global Access Partners (2021), GAP Initiatives, https://www.globalaccesspartners.org/think-tanks

Glover, G.H. (2011), Overview of functional magnetic resonance imaging, *Neurosurgery Clinics of North America*, vol. 22, no. 2, pp. 133–139

Green, E.H.H. (1999), Thatcherism: An Historical Perspective, *Transactions of the Royal Historical Society*, vol. 9, p. 17-42, Cambridge University Press

Inter-American Development Bank (2018), Exponential Disruption in the Digital Economy, https://publications.iadb.org/publications/english/document/Exponential-Disruption-in-the-Digital-Economy.pdf

McKinsey (2018), Delivering for citizens: How to triple the success rate of government transformations, https://www.mckinsey.com/industries/public-and-social-sector/our-insights/delivering-for-citizens-how-to-triple-the-success-rate-of-government-transformations

McLeod, S. (2018), Solomon Asch – Conformity Experiment, *Simply Psychology*, https://www.simplypsychology.org/asch-conformity.html

Morita, T., Asada, M. and Naito. E. (2016), Contribution of Neuroimaging Studies to Understanding Development of Human Cognitive Brain Functions, *Frontiers in Human Neuroscience*

Pfiffner, J.P. (1999), Traditional Public Administration versus The New Public Management: Accountability versus Efficiency, George Mason University

Psychology Today (2021), Groupthink, https://www.psychologytoday.com/au/basics/groupthink

Puccio, G.J. and Cabra, J.F. (2012), Idea Generation and Idea Evaluation: Cognitive Skills and Deliberate Practices, Handbook of Organizational Creativity, pp. 189–215

Shaw, G.B. (1921), Back to Methuselah. A metabiological Pentateuch, Pt. I, Act. I, London, Constable and Co.

Steelcase (2021), Creating Conditions for Workplace Creativity, https://www.steelcase.com/research/articles/topics/innovation/creating-conditions-for-creativity-in-the-workplace/

Triffitt, M. (2018), Reforming our political system is not a quick fix. Here's a step-by-step guide to how to do it, *The Conversation*, https://theconversation.com/reforming-our-political-system-is-not-a-quick-fix-heres-a-step-by-step-guide-to-how-to-do-it-102415

Weber, M. (1992), Grundriss der verstehenden Soziologie (Economy and Society), University of California Press

Zimbardo, P.G. (1999-2021), Stanford Prison Experiment, https://www.prisonexp.org

EDITORIAL COLUMN

WICKED PROBLEMS INVOLVE SOCIAL JUSTICE, SOCIAL CHANGE, CLIMATE CHANGE AND THE SOCIAL ECONOMY

At the Journal of Behavioural Economics and Social Systems (*BESS*™), we believe in problem-solving. When business and government confront complicated problems and becomes genuinely complex, new approaches are needed. Wicked problems involve social justice, social change, climate change and social economy issues characterised by stakeholder multiplicity and policy confusions. Addressing this difficulty requires negotiating politically, under conditions of uncertainty, and working effectively in networks and boundaries between academia, industry, and policy.

The conditions of uncertainty make the world a complex place. We never know what is coming next. The COVID-19 pandemic is a perfect example of how a virus transferred from its non-human to a human host started a chain reaction of infections worldwide with its deadly consequences! Just one small event has caused a humanitarian crisis that we have never seen before in our lifetimes. Utter chaos!

The good news is that after a while, the pandemic will recede. How long it will take, no one can say. However, based on our knowledge of past pandemics, humanity will adapt to the chaos. Some form of equilibrium or new normality will occur – until the next tiny event triggers another chaotic chain reaction. Normality and chaos are inescapable elements of human existence.

Normality and chaos are part of nature, the environment, business, and our personal lives. If we do not understand and accept that normality and chaos go hand in hand, we are disadvantaged. Suppose we can understand and leverage normality and chaos. In that case, we can use them to our advantage. The advantage is achieved by experimenting and probing our living environment to be a catalyst for change. We need to understand that small changes can have catastrophic impacts if we do not have systems to control and combat chaos. Optimistically, humanity must probe and experiment so we can prepare better for the next potential pandemic.

We call the systems that we probe and experiment with complex systems. Real-world systems are complex systems, where critically important information resides in the relationships between the parts and not necessarily within the parts themselves. Complex systems are interdependent and diverse entities that can adapt and respond to their local and larger environment (Page, 2011). Complex systems have dynamic and fluid reactions like dancing landscapes changing over time (Page, 2015). Complex systems consist of many microscopic components interacting in nontrivial ways (Sayama, 2015). Thus, understanding complex systems is essential to understanding how the world works.

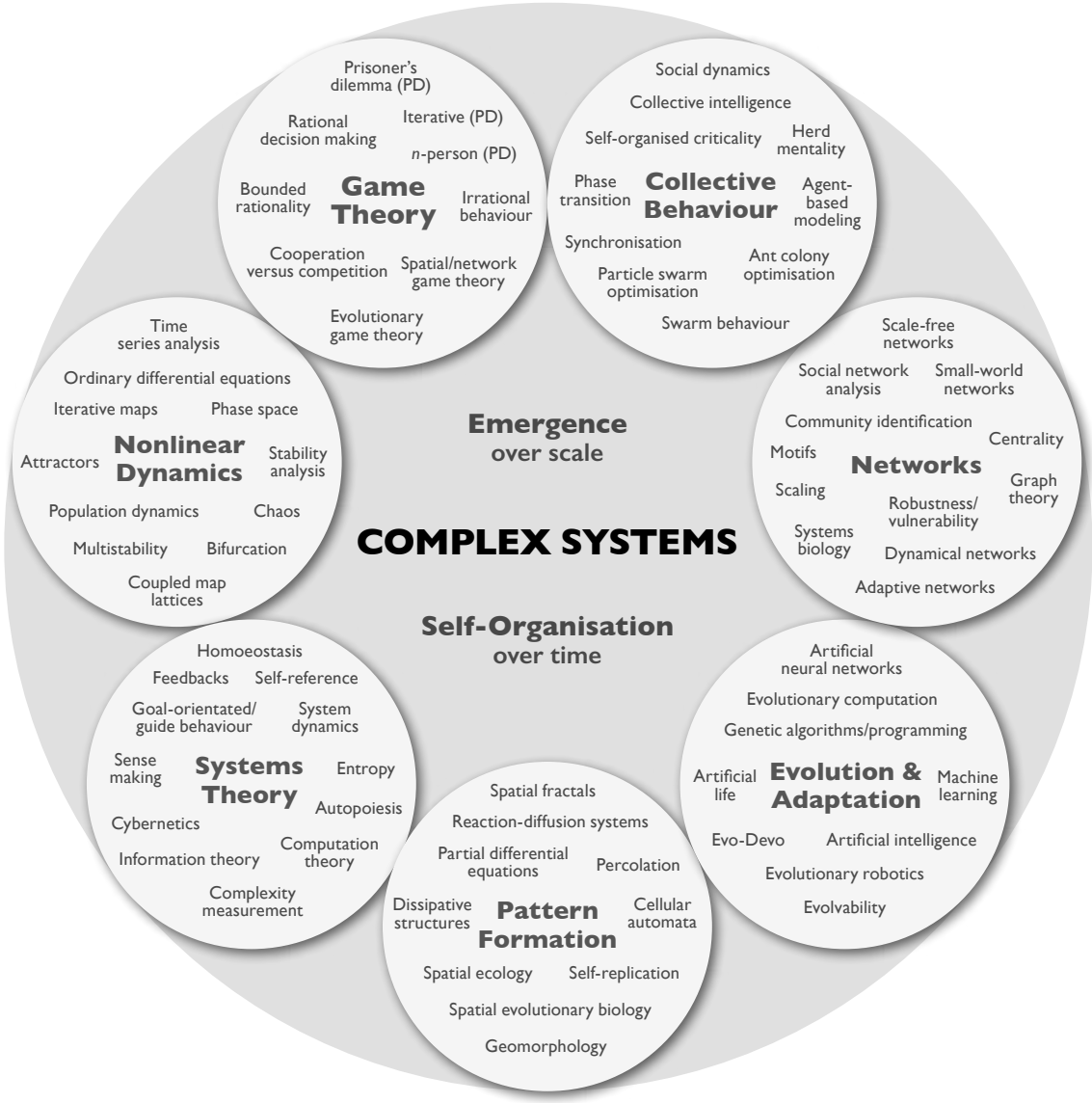
To help understand complex systems, several theories in business and science are in use, as Hiroki Sayama (2015) illustrates in Figure 1. Within each theory, there are various pathways to understanding them.

At *BESS*™, we are theory-neutral. Authors can use whatever theory they want to explain complex systems. Also, we encourage essays that are problem-solving and do not necessarily need a theoretical lens.

In *Compliance and creativity*, Peter Fritz (2021a) tackles the complex problem of public policy and its implementation. He argues that rigid jurisdictional boundaries prevent stakeholders from cooperating to address complex problems that cut across bureaucratic boundaries. The defence of internal vested interests means that governments cannot optimise innovative policies for the common good. Peter argues that to optimise innovative policies, we must find a way to optimise human resources. Through the Second Track process, one way builds on social science and neurobiology findings to improve the way individuals interact in groups to generate and implement imaginative and practical policies.

Natalie P. Stoianoff (2021), in the article *Research methodologies and methods to effect change in law and social systems* promotes different research methodologies and methods available for decision-making as part of the proactive role of civil society in participatory democracy. In particular, methods and methodologies of decision-making as part of the complex process for the development of laws and regulations that try to achieve social and economic change. She provides two case studies: tax policy and climate change, and Indigenous self-determination and on Indigenous Ecological Knowledge (IEK) and its protection. Both case studies explain how experts and stakeholders from relevant sectors were bought together in policy development and decision-making by collaboratively engaging with the issues. These two case studies demonstrate the significance of the Second Track process in decision-making to achieve positive outcomes for social change.

FIGURE 1: ADOPTED FROM HIROKI SAYAMA (2015), COLLECTIVE DYNAMICS OF COMPLEX SYSTEMS



Peter Fritz's (2021b) article on *The neuroscience of the Second Track* hypothesis argues that the Second Track process changes the way people consider issues through positive neurological feedback. Adopting the Second Track would complement traditional first track approaches. His paper draws between the Second Track and streams of neurological research and the complexity of neurobiology of human social interactions. He concludes by arguing that if individuals within a group disagree on a common end and do not work cooperatively towards it, then they soon become less than the sum of their parts. The great success of Second Track groups is that they form a 'group brain' which is greater than the sum of its parts.

Andrew Tatrai (2021) in *How do we solve wicked problems? Effective crowd management* argues that as the world becomes crowded, effective crowd management is essential for every organisation responsible for safety, yet literature is fragmented in theory and practice for solutions across the broad range of crowd behaviours. His paper introduces concepts that improve our understanding of crowd behaviour and new tools to improve the management of crowds. He states that emergent behaviour is an advancement of systems thinking that replicates how nature changes and new forms emerge. Changes, agents, rules, and the environment all affect the result or output. The emergent behaviour concept fits crowds because the behaviour of a system emerges from the structure of its parts, and a crowd's behaviour cannot easily be predicted or extrapolated from the behaviour of those individual parts. Emergent behaviour refers to how complex systems and patterns arise out of a multiplicity of relatively simple interactions, and thus, it cannot be predicted by linear or inflexible theory. Emergent behaviour looks remarkably like crowd structures, with bottom-up changes driving adaptive responses.

Les Pickett (2021a), in the first essay in this edition, *Learning for Competitive Advantage and Business Success*, explores current research and effective practices to how learning facilitates business success. He argues that the complexity associated with rapid changes in the contemporary business environment sometimes resemble Alice's croquet game in Wonderland. Every element is in motion in that game – technology, suppliers, customers, employees, corporate structure, industry structure, government regulation – and cannot remain stable for long. His point is that technological priorities for learning are moving away from course-centric technology to adaptive learning systems that support analytics, collaborative tools, mobile delivery and other tools that produce agile, engaging learning experiences for a diverse and tech-savvy workforce.

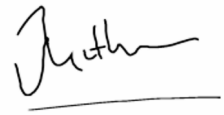
In a companion essay, *Building The Learning Organisation*, Les Pickett (2021b) argues that every organisation must become a learning organisation – rather than the tired old method of leaders believing that getting their organisations to learn is only a matter of articulating a clear vision, giving employees the right incentives, and providing lots of training. Les assumes that this assumption is flawed and risky, given intensifying competition, advances in technology, and shifts in customer preferences.

Walter de Ruyter (2021), in his essay on the *COVID-19 Hotel Quarantine Inquiry*, examines how we can adopt antifragility as a framework for better managing unforeseen circumstances, often called 'black swan' events such as COVID-19. He considers the influence of groupthink, using the Australian State of Victoria's inquiry into hotel quarantine failures as an illustration.

Brian Schmidt's (2021) transcript of the 2021 UN Climate Adaptation Summit speech, entitled *We must keep learning and keep doing*, is included in its totality. As you will see, he tackles the complex issue of climate change chaos. He argues that heading off cataclysmic climate change appears so huge and so complicated that it sometimes seems futile. However, he is optimistic that science and societal change will slow global warming. Nevertheless, unless we head off catastrophic climate change, our lives on this planet will be more complex, more dangerous and less pleasant. He states that we have all seen the tragedies COVID-19 is causing, and are witnessing the pressures it has placed on our societies and our political systems. Furthermore, COVID-19 will be nothing compared to the stress that uncontrolled global warming will cause, with floods, fires, droughts, famines, unbearable heatwaves, and other human calamities.

Olga Bodrova's (2021) in *The time for resilience is now* summarises the 2020 GAP Summit focused on national resilience and ways to safeguard Australia against future economic, strategic and environmental threats. The outbreak of COVID-19, following the drought and bushfire emergencies of the 2020 summer months, has emphasised the need for individuals, companies, civil society and government to work together for the common good. Our security as a nation depends on our collective resilience. Recent crises will prompt the fundamental reappraisal that Australia requires. Summit participants argued that we need a frank and broad-ranging independent assessment of emerging risks and vulnerabilities. The outcome should lead to a comprehensive national resilience framework as part of a coherent strategy to build public confidence and strengthen our collective ability to handle future challenges of any type.

Our ability to handle future challenges is essential. However, we must build our resilience using complex adaptive systems that sense small changes to our world that may have catastrophic impacts. Building this resilience is not easy because government policy typically evolves around know scenarios and knee jerk reactions to social wrongs and catastrophes. Such policy is like closing the gate after the horse has already bolted. Thus, we must cope as best we can with the wicked problems caused by the COVID-19 crises. We must also deal with social justice, social change, climate change and the social economy. However, we must also start building social systems that collectively and continually involve the best minds to look for the outliers that one day may cause the next calamity. Without such systems, we are always living on the edge of chaos!



Prof James Guthrie AM

Prof John Dumay

Sydney, May 2021

REFERENCES

Bodrova, O. (2021), 'The time for resilience is now': Recommendations of the 2020 GAP Summit on National Resilience, *BESS™*, vol.3, n.1, 2021

De Ruyter, W. (2021), COVID-19 Hotel Quarantine Inquiry. Virtoria, Australia, *BESS™*, vol.3, n.1, 2021

Fritz, P. (2021a), Compliance and Creativity, *BESS™*, vol.3, n.1, 2021

Fritz, P. (2021b), The neuroscience of the Second Track, *BESS™*, vol.3, n.1, 2021

Page, S.E. (2011), *Diversity and complexity*, Princeton, N.J, Princeton University Press.

Page, S.E. (2015), What sociologists should know about complexity. *Annual Review of Sociology*, 41, 21-41.

Pickett, L. (2021a), Learning for Competitive Advantage and Business Success , *BESS™*, vol.3, n.1, 2021

Pickett, L. (2021b), Building the learning organisation: an Australian case study, *BESS™*, vol.3, n.1, 2021

Sayama, H. (2015), *Introduction to the modeling and analysis of complex systems*, Geneseo, NY, Geneseo, NY: Published by Open SUNY Textbooks, Milne Library, State University of New York at Geneseo

Schmidt, B. (2021), 'We must keep learning and we must keep doing', Speech to 2021 UN Climate Adaptation Summit, *BESS™*, vol.3, n.1, 2021

Stoianoff, N.P. (2021), Research methodologies and methods to effect change in law and social systems, *BESS™*, vol.3, n.1, 2021

Tatrai, A. (2021), How do we solve wicked problems? Effective crowd management, *BESS™*, vol.3, n.1, 2021

CONTENTS

ARTICLE

RESEARCH METHODOLOGIES AND METHODS TO EFFECT CHANGE IN LAW AND SOCIAL SYSTEMS

Prof Natalie Stoianoff

Intellectual property expert Prof Natalie Stoianoff demonstrates the value of the Delphi Method and Second Track processes in developing laws and regulations that aim to achieve social change. One of her case studies deals with environmental tax and climate policy reform, while another shows how Indigenous legal systems can be integrated within the framework of Australian common law.

INTRODUCTION

This article considers the different research methodologies and methods available for decision-making as part of the proactive role of civil society in participatory democracy. In particular, this article explores methods and methodologies of decision-making as part of the development of laws and regulations that try to achieve social and economic change. This is achieved through the lens of two research case studies: one that deals with tax policy and climate change and the other that deals with Indigenous self-determination.

This article commences with an overview of the Delphi Method or technique. The decision-making method is known as the Delphi Method,[1] and its variations in some contexts were utilised in research on issues around developing and evaluating tax policy, particularly concerning the environment and climate change. The Delphi technique, primarily used in qualitative research, aims to obtain a reliable consensus of a group of experts or reference group through several

1. Guglyuvatyy and Stoianoff, 2015

rounds of a set of questionnaires.[2] The traditionally anonymous results of each iteration encourage the experts to revise their previous answers given 'collective intelligence' so that the group may move to a consensual view.[3] Alternatively, the *group Delphi* method brings together that expert group in structured communication using rotating subgroups to address the relevant questionnaire(s) (applying Likert scaling) and open questions.[4] Plenary discussions are used to build consensus and define disagreement between iterations to foster peer review.[5] The article demonstrates how this process was used to determine an evaluative framework for environmental tax and climate policy reform.

The second case study is in the next section of this article. I have been using the Delphi Method mixed with action research methodologies to develop legislation that supports and promotes Indigenous self-determination by engaging the people that the legislation is designed to protect. The research demonstrates how Indigenous legal systems can be integrated within the framework of Australian common law.

In line with the concepts of Second Track processes, the development of such legislation initially brought together Indigenous and non-Indigenous experts from various fields and sectors to work collaboratively in developing a framework for the protection and use of Aboriginal ecological knowledge in NSW. This framework was then expanded into a national project, funded under the Australian Research Council Linkage Scheme, designed to create a legal governance structure for Indigenous Australians by utilising participatory processes within an Indigenous research paradigm.

Both case studies bring together experts and stakeholders from relevant sectors to work together in policy development and decision-making by engaging collaboratively with the issues and working towards positive solutions that may be implemented, ultimately, through the legislative system. These two case studies will demonstrate the significance of Second Track processes in decision-making to achieve positive outcomes for social change.

THE DELPHI METHOD AND ITS USE IN SOCIO-LEGAL RESEARCH

The Delphi Method or technique gets its name from the Ancient Greek temple of Apollo in Delphi. There, the oracles of Delphi accumulated knowledge on people's lives and problems and the solutions to those problems[6] with the ultimate intention to make the world a better place.[7] While answering questions for officials to the general public, '[a]n oracle's function was to tell the divine purpose in a normative way to shape coming events'.[8]

The modern-day Delphi Method has its origins in researchers at the Rand Corporation in the 1950s.[9] As Linstone and Turoff explain:

> **'The Delphi concept may be viewed as one of the spinoffs of defense research. "Project Delphi" was the name given to an Air Force-sponsored Rand Corporation study, starting in the early 1950s, concerning the use of expert opinion. The objective of the original study was to "obtain the most reliable consensus of opinion of a group of experts... by a series of intensive questionnaires interspersed with controlled opinion feedback".'**[10]

2. McKerchar, 2010
3. Guglyuvatyy and Stoianoff, 2015, p. 186
4. Webler et al., 1991
5. Ibid
6. Guglyuvatyy and Stoianoff, 2015, p. 184
7. Sokolov, 2007
8. Guglyuvatyy and Stoianoff, 2015, p. 185
9. Dalkey and Helmer, 1963
10. Linstone and Turoff, 1975

That research, conducted by Dalkey, Helmer, and Rescher at Rand Corporation, has been described by Mitroff and Turoff as a prime 'example of… Lockean inquir[y]',[11] That is, the inquiring system (I.S.) is based on the process of developing models or theory from empirical content.[12] In summary, Mitroff and Turoff explain:

> '*the data input sector is* not only *prior to the formal model or theory sector, but it is separate from it as well. The whole of the Lockean I.S. is built up from the data input sector…*In brief, Lockean I.S. are the epitome of *experimental, consensual* systems.'

By contrast, Mitroff and Turoff point out that under Leibnizian enquiry systems, emphasis is given to the theoretical model, which is separate and necessary before collecting data.[13] Further, by adopting a Kantian inquiry system, Mitroff and Turoff explain that theory and data are inseparable:

> 'Theories or general propositions are built up from data, and in this sense theories are dependent on data, but data cannot be collected without the prior presumption of some theory of data collection (i.e., a theory of "how to make observations," "what to observe," etc.), and in this sense data are dependent on theories.'[14]

In recognition of this interdependence, both case studies demonstrate the need to formulate, if not theories, at least hypotheses based on the literature, in the case of the tax policy and climate change project, or on comparative legal regimes, in the case of the Indigenous self-determination over Indigenous ecological knowledge project.

Both case studies deal with highly politicised issues in their way and require comprehensive policy assessment to achieve careful long-term balanced law/policy-making.[15]

Recognising that there may be a lack of rationality in the processes of political decision-making, it is noted that institutional dependencies and political factors may limit the range of available policy options.[16] Rather than cooperate in the process of identifying the best overall policy option, different actors may have a specific set of preferences aimed to influence policy evaluation to achieve their own goals.[17] However, the two case studies will demonstrate that 'policy-making processes can at least be designed to a certain extent according to the principles of rational discussion and balanced problem solving'.[18] As the Indigenous self-determination project demonstrates, 'a careful analysis of the problem and the evaluation of available options should efficiently identify mutually acceptable solutions, thereby informing law and policy decision-making'.[19]

TWO CASE STUDIES IN PARTICIPATORY RESEARCH

Tax Policy and Climate Change

The first case study is concerned with the evaluation of environmental tax measures (ETMs). The Delphi study, undertaken in the development of a tax policy analysis framework to evaluate the effectiveness of ETMs, was able to build such a framework from a critical assessment of the menu of factors advanced as possibilities in the prior literature. While Australia's ETMs have been operational for over 30 years, they have not been

11. Mitroff, I.I. and Turoff, M., Philosophical and Methodological Foundations of Delphi (in Linstone and Turoff, 1975)
12. Ibid., pp. 20-21
13. Ibid., p. 23
14. Ibid., p 25
15. Mickwitz, 2006
16. Becker, 1983
17. Bernauer and Caduff, 2004
18. Guglyuvatyy and Stoianoff, 2015, p 181
19. Ibid.

evaluated to assess their efficiency and effectiveness. *Australia's future tax system: Report to the Treasurer* (Henry Tax Review)[20] recognised that concessions and other such measures need to be evaluated for effectiveness. One important consideration is whether the design of these measures could be improved to ensure accurate targeting. The Organisation for Economic Co-operation and Development (OECD) has stressed targeting measures to encourage environmentally responsible behaviour and the need to limit investment in direct tax concessions to those 'which will have a beneficial environmental impact' while noting the difficulty faced by 'revenue authorities to verify this cheaply and effectively'.[21] A further literature review identified several other criteria to be put to a Reference group of environmental tax experts from around the globe for their consideration and prioritisation. The Delphi study adopted combined the traditional anonymous questionnaires followed by *group Delphi* sessions to develop the evaluation framework.

Indigenous Self-Determination and Indigenous Ecological Knowledge

The second case study is in two parts. The first was concerned with the 2013-14 research project *Recognising and Protecting Indigenous Knowledge associated with Natural Resource Management*, supported by the Aboriginal Communities Funding Scheme of the NSW Namoi Catchment Management Authority (now North West Local Land Services (NWLLS)). The first stage of that project comprised a comparative study of relevant international instruments to identify common provisions between the different agreements that would ideally reflect draft legislation for Australian use. These identified common provisions were then used as the criteria for analysing regional and national legislation around the world relating to traditional knowledge and genetic resources. This law database was presented to a working party who had volunteered to be involved in the second stage of our research, drafting the model law and preparing a Discussion Paper. This working party included Aboriginal Elders and other Aboriginal People, lawyers, academics and participants with experience in developing similar laws in other countries. In essence, the working party operated under the *group Delphi* process to develop the key provisions of the model law and prepare the Discussion Paper. Then the third stage of the project carried on a series of Aboriginal community consultations in the North West of NSW to refine the elements of a model law as presented in the Discussion Paper. The result was a White Paper for the Office of Environment and Heritage proposing a model law that would protect and regulate access to Indigenous knowledge.

The second part of the case study was the 2016 Australian Research Council (ARC) Linkage Grant project: *Garuwanga: Forming a Competent Authority to Protect Indigenous Knowledge* (Garuwanga Project). It builds on the first part of the case study by developing a crucial element of the governance of the model law, namely, finding the best legal structure of governance for Indigenous Australians to manage their traditional knowledge and culture and enable Australia to comply with the Nagoya Protocol.[22] The objective is to provide the communities with a path to sustainable development and capacity building. To achieve this, the Garuwanga Project had three aims:

1. identify and evaluate a variety of legal governance structures for a Competent Authority suitable for administering an Indigenous Knowledge protection regime;

20. Henry et al., 2009
21. OECD, 1993
22. *Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) to the Convention on Biological Diversity*, adopted by the Conference of the Parties to the Convention on Biological Diversity at its tenth meeting on 29 October 2010 in Nagoya, Japan and entered into force on 12 October 2014 ('Nagoya Protocol').

2. facilitate Aboriginal Community engagement in making that determination; and
3. recommend a type of Competent Authority structure based on what is vital to Aboriginal Communities and how such a Competent Authority should operate.[23]

A Research Roundtable formed to address issues and operated once again under a *group Delphi* process, the details of which will be discussed further in section 5 of this article.

TAX POLICY AND CLIMATE CHANGE

The decision-making method known as the Delphi Method and its various iterations in several contexts, were utilised in my research for developing and evaluating tax policy, specifically concerning the environment and climate change. In particular, the Delphi study undertaken to develop a tax policy analysis framework to evaluate the effectiveness of environment-related tax expenditures (ETMs) is the focus of the first case study in this article. It is hereafter referred to as the Stoianoff and Walpole Study.[24]

An international group of expert environmental taxation scholars (the Reference Group) were brought together to participate in a roundtable held during the 16th Global Conference on Environmental Taxation (GCET16) at the University of Technology Sydney (UTS) in September 2015. This Stoianoff and Walpole Study used a variation on the *group Delphi* method, employing an initial anonymous questionnaire to the Reference Group participants for round one, followed by the group version of the Delphi study, the Roundtable round two. The Roundtable utilised a single group divided into several subgroups and two plenary discussions to refine and rank the evaluation criteria. Ethics approval from the UTS Human Research Ethics Committee was obtained, and its protocols were observed.

Reference Group members were required to complete a questionnaire before participating in the half-day Roundtable conducted on the last day of GCET16. The Reference Group participants were asked to examine the adequacy and completeness of a list of pre-selected evaluation criteria and update that list with other necessary criteria. In addition, they were asked to prioritise the most appropriate criteria for the evaluation of ETMs. Twenty-nine of the sixty-seven invited experts responded to the questionnaires, and so those twenty-nine respondents formed the Reference Group for the *group Delphi* roundtable.

The results of the first questionnaire were de-identified for use in the Roundtable. The results were converted into a priority table, reported in Table 1, with 1 being the highest priority and 12 the lowest priority. At all stages of the Delphi study, the experts were asked to comment on any feature of the questionnaire, terminology or approach. The questionnaires, both before and during the Roundtable, were designed to obtain personal responses to the issues and allow the experts to verify their views.[25] The Reference Group members identified an additional thirty-two criteria from the first round questionnaire. While there are overlaps among these thirty-two additional criteria, they were considered sufficiently different to warrant them being listed in the second-round questionnaire.

The original thirteen evaluation criteria were identified from the literature, considering the results of various Australian tax reviews, OECD reports, and the reviews in other nations such as the U.S.

23. Indigenous Knowledge Forum, 2018
24. Stoianoff and Walpole, 2016
25. The personal responses are reported in The Stoianoff and Walpole Study (Stoianoff and Walpole, 2016

TABLE 1

EVALUATION CRITERIA	PRIORITY
The closeness of the link between the concession and the environmental damage to be remedied or behaviour desired	1
Considering what is the most appropriate design of the instrument	2
Whether other policy instruments would better achieve the program objectives	3
The establishment of the goals behind the concession	4
Consistency or 'mutual reinforcement' between environmental and tax policies and between their institutional frameworks and administrative structures	5
Accountability	6
Transparency and the cost to the community	7
Equity including intergenerational equity of the program	7
Considering whether the measures are meeting a valid government objective	8
Administrative costs including compliance costs	9
Simplicity of the fiscal structure	10
Efficiency and the need to identify the deviation from the neutral tax	11
Controllability	12

Joint Committee on Taxation evaluation of tax expenditures that have been taking place since 1972.[26] The fact that thirty-two additional criteria were suggested as alternatives indicates that the literature provided criteria that were either 'poorly expressed, mix concepts together that ought to be separated, separate[d] concepts that ought to go together, or [just] miss[ed] the point of being evaluative criteria'.[27]

During the second round of the Delphi study, that is, during the Roundtable of the Reference Group members (and various other GCET16 delegates who chose to participate), an initial plenary was conducted to explain in more detail the purpose of the Stoianoff and Walpole Study and the nature of the evaluation criteria identified and presented in the first questionnaire. At this point, the second questionnaire was distributed to all present at the Roundtable, and several sub-groups were formed of varying sizes to discuss the initial prioritisation and the additional criteria and any other issues of relevance. The second plenary brought the sub-groups back together to discuss the evaluation criteria before the members of the Reference

26. Mann, 2009
27. Stoianoff and Walpole, 2016

Group present completed and returned the second questionnaire. A table of de-identified results from the first questionnaire was reproduced in the second questionnaire to enable Reference Group members the opportunity to revise their initial responses regarding the importance of the pre-selected evaluation criteria. A total of fifteen responses were received. The result of the second round of the study, employing the variation of the *group Delphi*, was a significant readjustment to the weightings of some of the pre-selected criteria, as demonstrated in Table 2 below. Further, in the plenary discussions, it became apparent that the number of evaluation criteria ought to be limited to no more than ten and that there was consensus that the first four criteria in Table 2 were the most important for an evaluation framework. As for the additional criteria, the final plenary concluded that refining the thirty-two additional criteria would benefit from focusing on a small number of broadheads with several subheadings providing greater specificity.

TABLE 2

EVALUATION CRITERIA	PRIORITY 1ST ROUND	PRIORITY 2ND ROUND
The closeness of the link between the concession and the environmental damage to be remedied or behaviour desired	1	1
Considering what is the most appropriate design of the instrument	2	2
Accountability	6	3
Equity including intergenerational equity of the program	7	3
Transparency and the cost to the community	7	4
Whether other policy instruments would better achieve the program objectives	3	5
The establishment of the goals behind the concession	4	5
Consistency or 'mutual reinforcement' between environmental and tax policies and between their institutional frameworks and administrative structures	5	5
Administrative costs including compliance costs	9	6
Considering whether the measures are meeting a valid government objective	8	7
Simplicity of the fiscal structure	10	8
Controllability	12	9
Efficiency and the need to identify the deviation from the neutral tax	11	10

INDIGENOUS SELF-DETERMINATION AND INDIGENOUS ECOLOGICAL KNOWLEDGE

The second case study in this article focuses on Indigenous ecological knowledge (IEK) and its protection. IEK is of significant spiritual, cultural and economic value to Aboriginal and Torres Strait Islander communities and society at large, including governments, research institutions and commercial interests.[28] Such knowledge is relevant across several spheres, from medicinal treatments and pharmaceuticals to food production and land management, such as cultural burning to safeguard ecosystems and avoid wildfires.[29]

What is crucial to the development of a protection regime for such IEK is the involvement of Australia's Indigenous Peoples in the creation, operation and administration of such a regime. Indigenous empowerment is crucial to achieving sustainable development. As the Empowered Peoples Design Report points out, 'a development approach foregrounds the role of individual, family and collective agency and responsibility' in achieving 'success in closing socioeconomic disparity', thereby avoiding the 'crippling effect of dependence' that the current Australian social policies of welfare payments have produced.[30]

Australia has a history of paternalism concerning making laws for the 'benefit' of Indigenous Australians.[31] Consequently, it was imperative for the projects in this case study that Indigenous communities be empowered through direct involvement in the research process. In this way, community-led solutions could be achieved through axiologies (ways of doing) and ontologies (ways of being), with the use of the Working Party in the first part of the case study and the Research Roundtable in the second part, but in each instance following up with a community consultation process.

Recognising and Protecting Aboriginal Knowledge Associated with Natural Resource Management

The research project *Recognising and Protecting Indigenous Knowledge associated with Natural Resource Management* was funded by the Aboriginal Communities Funding Scheme of the Namoi Catchment Management Authority (now NWLLS) (the NSW White Paper project). The research was carried out through UTS and on behalf of the Indigenous Knowledge Forum. The project aimed to:

a. identify key elements of a regime that will recognise and protect Indigenous knowledge associated with natural resource management;

b. facilitate Aboriginal Community engagement in the process of developing a regime;

c. develop a draft regime that no only accords with the aims and goals of North West NSW Aboriginal Communities but would be a model for implementation in other regions in NSW;

d. produce a Discussion Paper through which the draft regime could be distributed for comment;

e. conduct community consultations to refine the draft regime into a model that may be implemented through NSW legislation by finalising a White Paper delivered by the UTS Indigenous Knowledge Forum and NWLLS to the Office of Environment and Heritage (NSW).

The White Paper proposed a legislative 'Competent Authority' framework for recognising and protecting Aboriginal knowledge associated with natural resource management. The Authority

28. Indigenous Knowledge Forum, 2014
29. Commonwealth of Australia, 2013, pp. 21, 31, 36-37, 39
30. Wunan Foundation, 2015, p. 13
31. Maddison, 2008

would provide the governance framework for administering a legal regime covering the creation, maintenance and protection of Aboriginal community knowledge databases. The use of the term 'Aboriginal' instead of 'Indigenous' was preferred by the Indigenous members of the Working Party, and the communities involved in the project as the Indigenous communities of NSW are Aboriginal and are recognised as such in the NSW Constitution.[32]

The inaugural Indigenous Knowledge Forum, held at UTS in August 2012, inspired the design of the NSW White Paper project to develop a model of involvement in natural resource management and access to *Country*.[33] The funded project proceeded with the advice of the Aboriginal Officer of the NWLLS and the Namoi Aboriginal Advisory Committee (NAAC). It was carried out in three stages, commencing with developing a comparative framework, followed by drafting the *sui generis* regime and Aboriginal community consultation to refine the regime. The first stage involved a comparative, doctrinal study, analysing legislative and policy regimes operating worldwide. Critical elements in each regime were identified and then compared to international obligations. This comparative analysis provided the framework on which a model could be developed to ensure the recognition and protection of IEK.

In stage two, a working party was formed to develop a *sui generis* regime, comprising Indigenous and non-Indigenous members from the UTS Indigenous Knowledge Forum committees,[34] participants from the 2012 Indigenous Knowledge Forum, and key personnel from the NWLLS and the NAAC (the Working Party). This working party was, in effect, a reference group of experts and stakeholders for what would turn out to be a *group Delphi* process of determining the key provisions for a *sui generis* regime to protect IEK. The comparative framework provided the pre-selected criteria for such a *sui generis* regime.

Once determined, a Discussion Paper incorporating the Comparative Study Report and Draft Regime was prepared, and in stage three, it was distributed through the NWLLS to the Namoi Catchment Aboriginal Communities and other interested parties. Consultation sessions were conducted on Country according to relevant cultural norms and protocols in key locations in the region. The consultations tested the draft legal framework against Aboriginal community concerns and expectations, thereby enabling it to be refined into a culturally acceptable model set out in the NSW White Paper and presented to the Office of Environment and Heritage.

The NSW White Paper project addressed the need for recognition and protection of IEK by engaging the local, grassroots level, employing variations of an action research methodology coupled with an Indigenous research paradigm at both stages two and three. Indigenous Australians actively participated in the process of formulating legislation for their benefit. The action research methodology emphasises cooperative or collaborative inquiry[35] whereby all active participants, Indigenous and non-Indigenous, are fully involved in research decisions as co-researchers.[36] The project provided all interested parties with access to analysis of current models for and outcomes of implementing similar legislation in other countries through the internet. This assisted in the process of identifying how best to accommodate unique aspects of IEK and culture as they relate to the interests of Indigenous Australians.

32. Constitution Act1902 (NSW), s. 2
33. Indigenous Knowledge Forum, 2012
34. The Organising Committee and the Advisory Board
35. Heron, 1996
36. Reason and Bradbury, 2007

The methodologies demonstrated in the NSW White Paper project emphasise the significance of Second Track processes in decision-making to achieve positive outcomes for social change. Participation assisted in generating Indigenous ownership of the outcomes, understanding of any resulting legislation and its intent, and an opportunity to deliver legislation that meets Australia's international obligations and effectively protects the interests of a sector of the Australian community. During stage two, the Indigenous research paradigm was important in engaging all participants in collecting research data through the method of storytelling by Indigenous Elders in the group, exploring the meaning and working through issues together to ensure accurate interpretation of language.[37] This process was then adopted during consultations on *Country*, being mindful of the culture of place and the privilege of sharing in the flow of cultural knowledge.

Garuwanga: Forming a Competent Authority to Protect Indigenous Knowledge

This project has worked with several Aboriginal communities to identify, evaluate and recommend an appropriate Competent Authority legal structure so Australia can meet the requirements of the Nagoya Protocol. This Protocol calls for a Competent Authority to govern and administer a framework that ensures Indigenous communities' informed consent is obtained for access to their traditional knowledge (referred to as Indigenous Ecological Knowledge (IEK) in this article), and that fair and equitable benefit-sharing mechanisms for the use of that knowledge are established. Working with Aboriginal communities, this project addresses concerns over the form, independence and funding of the Competent Authority so IEK and Indigenous culture can be protected and shared.

Much like the NSW White Paper project, the use of mixed modes of research was applied in a structured way, commencing with a doctrinally based comparative analysis of existing protection regimes employing a competent authority for their governance. Inspiration for the extent of the comparative study undertaken – 69 nations – came from attendance at the 2015 World Expo in Milan, where numerous nation-states showcased their traditional or Indigenous knowledges and farming practices that resulted in potential export markets.[38] Given the World Expo theme of 'Feeding the Planet, Energy for Life', it became apparent from that event that both government and non-government organisations were instrumental in promoting Indigenous food resources and Indigenous knowledges regarding the same. Simultaneously, the project has collected data of Aboriginal governance case study examples around Australia, drawing upon the list of community concerns identified in the NSW White Paper project as the initial criteria for evaluating these different forms of governance.

The evaluation of these regimes and governance case studies has been carried out through the Research Roundtable employing a variation on a *group Delphi* method in much the same way as in the NSW White Paper project. In the Garuwanga project, the expert panel forming the Research Roundtable was comprised of the chief investigators under the ARC grant, the Aboriginal partner investigators and several other Indigenous and non-Indigenous experts (additional investigators) in various relevant fields. The criteria for evaluating the variety of governance

37. Czaykowska-Higgins, 2009
38. Bureau International des Expositions, Expo Milano, 2015

regimes adopted for the Competent Authority were first identified using the existing literature.[39] However, the Research Roundtable determined that these lists of 'good governance principles' needed to be refined for the Garuwanga Project. Utilising the *group Delphi* open plenary process, a set of ten governance principles were identified and discussed to achieve consensus for the preparation of a discussion paper to be presented to the Aboriginal communities being consulted via the project Aboriginal Partner Organisations. The list of governance principles identified for evaluating potential governance structures for the Competent Authority are as follows:[40]

- Relationships/Networks
- Trust/Confidence
- Independence from government
- Community participation
- Guarantees/Confidentiality
- Transparency/Accountability
- Facilitation
- Advocacy
- Communication
- Reciprocity[41]

The consultations were carried out in focus group sessions with Elders and knowledge-holders from each of the communities. The outcome of those sessions was analysed for incorporation into the drafting of the final report recommending the most appropriate and acceptable form of governance, keeping in mind the identified governance principles. The analysis of the consultations can be found on the Indigenous Knowledge Forum website.[42]

Once again, underpinning the Garuwanga Project is an action research methodology[43] with the Chief Investigators, Aboriginal Partner Investigators and members of the Aboriginal Partner Organisations researching together through the mechanism of the Research Roundtable and after that the community consultations as described above. The project applied an Indigenous research paradigm[44] encompassing epistemologies (ways of knowing) through stories, narrative and reflection, connectedness to Country, culture and spirituality in a collaborative and interdisciplinary process. When referring to 'Country' in this context, it is in recognition that 'Aboriginal communities have a cultural connection to the land, which is based on each community's distinct culture, traditions and laws' and 'takes in everything within the landscape – landforms, waters, air, trees, rocks, plants, animals, foods, medicines, minerals, stories and special places'.[45] This process proved successful under the NSW White Paper project to ensure a deeper understanding of Aboriginal communities' concerns, especially the knowledge-holders charged with protecting the knowledge of a community.

As for the NSW White Paper project, the Garuwanga Project reinforces a model of respect, engagement, and reciprocity for Aboriginal and non-Aboriginal researchers to solve a problem. Then, the further engagement with communities emphasises the value of Second Track processes in producing the outcome of a more refined model of legal research and a mechanism for Aboriginal, indeed Indigenous, self-determination.

39. See United Nations Development Programme (UNDP) (1999), Governance for Sustainable Human Development, 1997 cited in International Fund for Agricultural Development, Good Governance: An Overview, Doc No EB 99/67/INF.4 (22 August 1999) 5-6; Australian Public Service Commission (2007), *Building Better Governance Guide* 2007, https://legacy.apsc.gov.au/building-better-governance; Municipal Association of Victoria, Victorian Local Governance Association, Local Government Victoria and Local Government Professionals (MAV et al.) (2012),'Good Governance Guide – Helping Local Governments Govern Better', https://www.vlga.org.au/governance-leadership/local-government/good-governance-guide; and Australian Indigenous Governance Institute (AIGI), 'Indigenous Governance Toolkit', http://toolkit.aigi.com.au accessed 20 January 2019
40. Indigenous Knowledge Forum, 2018
41. See Indigenous Knowledge Forum, 2018, for detailed explanation of each criteria
42. Davis et al., 2020
43. Lewin, 1946
44. Wilson, 2001.
45. Office of Environment and Heritage, 2019

CONCLUSION

The two case studies demonstrate two crucial issues to consider when employing the Delphi process as a decision-making tool:

- Ensuring the participants understand the aim of the project; and
- The careful selection of the participants in the Delphi study.

While the typical characteristics of the Delphi Method are anonymity, controlled feedback and statistical response, what the two case studies analysed in this article have demonstrated is the important role that group engagement brings to a better understanding of the project aims and, therefore, the greater consensus in the final results of the project.

The Stoianoff and Walpole Study found four standout criteria from the 13 canvassed that demonstrated a consensus of the essential criteria for the evaluation of ETMs, namely, in order of priority: the closeness of the link between the concession and the environmental damage to be remedied or behaviour desired; considering what the most appropriate design of the instrument is; accountability; and equity including intergenerational equity of the program. The benchmarking achieved in the Stoianoff and Walpole Study due to employing the variation on the *group Delphi* method in the second round has assisted in developing a robust evaluation framework. The selection of participants in the Stoianoff and Walpole Study was also significant in this benchmarking process. The range of environmental tax expertise in the Reference Group covered law, accounting, economics and policy. Nevertheless, while such a reference group provides a consensus among international experts, what is missing is the input of stakeholders in the ETMs. This is why the next stage in developing the evaluation framework is a deeper dive into specific ETMs. To this end, stakeholders from three ETM case studies have been identified for the commencement of a new evaluation criteria Delphi study in order to refine the benchmark produced by the Stoianoff and Walpole Study.

Meanwhile, the use of the open plenaries, that is, for the Working Party in the NSW White Paper project and the Research Roundtable in the Garuwanga Project, proved essential to harnessing the project participants' collective expertise enabling the group to work through issues and achieve consensus. Equally, the selection of the participants in these projects was crucial to their success. The participants could be described as an inner circle of Indigenous and non-Indigenous experts (comprising the Working Party and Research Roundtable) supported by an outer circle of supporting community members enabling grassroots level consultations. In this way, inappropriate and unworkable generalisations could be avoided.

> **'What is apparent is the importance of "cultural fit" in recognition that Indigenous communities across Australia are different with different needs, expectations and cultural protocols.'** [46]

In order to achieve Indigenous empowerment, the embedding of culture and cultural practices are central to Indigenous governance. The methodologies employed in the second case study projects emphasise how governance capacity can be strengthened by enabling communities the flexibility to define their needs, design and control their response,[47] and thereby achieve self-determination. Adopting such Second Track methodologies more broadly would go some way towards addressing the failures of imposed 'western' governance systems.

46. N. Stoianoff, 2020, Sustainable Use of Indigenous Ecological Knowledge: A Case Study for Implementing the Nagoya Protocol, in Mauerhofer V., Rupo D., Tarquinio L. (eds) Sustainability and Law. Springer, Cham., pp. 431- 451, https://doi.org/10.1007/978-3-030-42630-9_22
47. Australian Institute of Family Studies (2015), 'What works in effective Indigenous community-managed programs and organisations CFCA Paper No. 32' – May 2015, https://aifs.gov.au/cfca/publications/what-works-effective-indigenous-community-managed-programs-and-organisations/critical

REFERENCES

Becker, G. (1983), A Theory of Competition among Pressure Groups for Political Influence, *Quarterly Journal of Economics*, vol. 98, no. 3, 371–400

Bernauer, T. and Caduff, L. (2004), In whose interest? Pressure group politics, economic competition and environmental regulation, *Journal of Public Policy*, vol. 24, 99–126

Bureau International des Expositions, Expo Milano (2015), https://www.bie-paris.org/site/en/2015-milan

Commonwealth of Australia (2013), Caring for Our Country Achievements Report 2008-2013

Czaykowska-Higgins, E. (2009) Research Models, Community Engagement, and Linguistic Fieldwork: Reflections on Working within Canadian Indigenous Communities, *Language Documentation & Conservation*, vol. 4, no. 1, 15–50

Dalkey, N.C. and Helmer, O. (1963), An experimental application of the Delphi method to the use of experts, *Journal of the Institute of Management Sciences, in: Management Science*, vol. 9, no. 3, 458–467

Davis, M., Cahill, A., Stoianoff, N.P., Martin, F., Wright, E., Collings, N. and Mowbray, A. (2020), *Report on Consultation Findings – Garuwanga: Forming a Competent Authority to protect Indigenous knowledge* (UTS – Indigenous Knowledge Forum, 2020), available at https://www.indigenousknowledgeforum.org/garuwanga-forming-a-competent-autho

Guglyuvatyy, E. and Stoianoff, N.P. (2015), Applying the Delphi method as a research technique in tax law and policy, *Australian Tax Forum: a journal of taxation policy, law and reform*, vol. 30, no. 1, 179–204

Henry, K., Harmer, J., Piggott, J., Ridout, H. and Smith, G. (2009), *Australia's future tax system: report to the Treasurer*, Commonwealth of Australia, http://www.taxreview.treasury.gov.au/content/downloads/final_report_part_1/00_AFTS_final_report_consolidated.pdf

Heron, J. (1996), *Co-operative Inquiry: Research into the Human Condition*, Sage, London

Indigenous Knowledge Forum (2012), Indigenous Knowledge Forum Report, https://www.indigenousknowledgeforum.org/publications

Indigenous Knowledge Forum (2014), *Recognising and Protecting Aboriginal Knowledge Associated with Natural Resource Management, White Paper for Office of Environment and Heritage NSW*, 2014, https://www.indigenousknowledgeforum.org/indigenous-knowledge-natural-resour

Indigenous Knowledge Forum (2018), *Garuwanga: Forming a Competent Authority to protect Indigenous knowledge – Discussion Paper*, UTS, April 2018, pp. 33-35, https://www.indigenousknowledgeforum.org/garuwanga-forming-a-competent-autho

Lewin, K. (1946), Action research and minority problems, *Journal of Social Issues*, vol. 2, no. 4, 34–46

Linstone, H.A. and Turoff, M. (1975), *The Delphi Method: Techniques and Applications*, p. 10, https://www.semanticscholar.org/paper/The-Delphi-Method%3A-Techniques-and-Applications-Moore-Lingstone/863472a67f5bdc67e4782306efd883fca23e3a3d, accessed 15 May 2021

Maddison, S. (2008), Indigenous autonomy matters: what's wrong with the Australian government's 'intervention' in Aboriginal communities, vol. 14, no. 1, *Australian Journal of Human Rights*, 41–61

Mann, R.F. (2009), Back to the future: Recommendations and predictions for greener tax policy, *Oregon Law Review*, vol. 88, no. 355, 359

McKerchar, M. (2010), *Design and conduct of research in tax, law and accounting*, Law Book Company, Pyrmont, p. 163

Mickwitz, P. (2006), Environmental policy evaluation: concepts and practice, Tampere, *Commentationes Scientiarum Socialium*

Morley, S. (2015), What works in effective Indigenous community-managed programs and organisations, CFCA Paper No. 32, May 2015, Australian Institute of Family Studies, https://aifs.gov.au/cfca/publications/what-works-effective-indigenous-community-managed-programs-and-organisations/critical

Nersesyants, V.S. (1984), *Socrates*, Publisher: Science, Moscow

NSW Government (1902), Constitution Act 1902, s. 2

Office of Environment and Heritage (2019), *Share Mungo Culture -Aboriginal Country*, Mungo National Park, New South Wales, http://www.visitmungo.com.au/aboriginal-country

Organisation for Economic Co-operation and Development (1993), Taxation and the Environment: Complementary Policies, OECD, Paris, 57

Reason, P. and Bradbury, H. (2007), *Handbook of Action Research*, Sage, London, 2nd edn

Sokolov, A.V. (2007), The method of critical technologies, *Forsyth*, vol. 4, 66–74

Stoianoff, N.P. (2020), Sustainable Use of Indigenous Ecological Knowledge: A Case Study for Implementing the Nagoya Protocol, in Mauerhofer V., Rupo D., Tarquinio L. (eds) *Sustainability and Law*, Springer, Cham, pp. 431- 451, https://doi.org/10.1007/978-3-030-42630-9_22

Stoianoff, N.P. and Walpole, M. (2016), Tax and the Environment: An Evaluation Framework for Tax Policy Reform – Group Delphi Study, *Australian Tax Forum*, vol. 31, no. 4, https://ssrn.com/abstract=2922284

Webler, T., Levine, D., Rakel, H. and Renn, O. (1991), A novel approach to reducing uncertainty – the group Delphi, *Technological Forecasting And Social Change*, vol. 39, no. 3, 253-263

Wilson, S. (2001), What is indigenous research methodology?, vol. 25, no. 2, *Canadian Journal of Native Education*, 175

Wunan Foundation (2015), E*mpowered Communities: Empowered Peoples Design Report*, 38, https://empoweredcommunities.org.au/wp-content/uploads/2018/04/EC-Report.pdf

ARTICLE

THE NEUROSCIENCE OF THE SECOND TRACK

Peter Fritz AO

Humanity's evolutionary advantage lies in our ability to cooperate and communicate within groups towards shared goals. Entrepreneur and philanthropist Peter Fritz AO argues that the Second Track process is more effective than other approaches because its format is aligned with our natural desire for positive group interaction.

INTRODUCTION

> 'If you want to go fast, go alone, if you want to go far, go together.' – African proverb

This article explores the potential links between current research into human neuroscience and the positive individual effects and social interactions facilitated by the Second Track Process. It suggests that future studies of participants' brain functions in Second Track groups could contribute to the burgeoning study of the neuroscience of social interaction[1].

Global Access Partners' (GAP) Second Track process[2] has progressed over 20 years of practical experience through the unstinting work of thousands of participants from Australia and overseas. Its outcomes include a report on genetic screening for a breast cancer drug which changed Victoria's health policy (2007); the establishment of the Centre for Social Impact (2008), a national centre for philanthropy and social investment; public consultation on NSW strata law reform (2012); the development of Australia's first National Cloud

1. Pfeiffer et al., 2013
2. Global Access Partners, 2021

Computing Strategy (2013); the establishment of the International Centre for Democratic Partnerships to build stronger relationships between Australia and the Pacific (2017); the Australian Space Initiative, which encouraged the creation of Australia's space agency (2017); and Federal government's embrace of soil carbon credits to mitigate carbon emissions (2019).[3]

The format's heuristics have been winnowed by GAP from this collective experience, rather than derived from prior theory, just as the individuals shape the activities of each Second Track group within it. While GAP remains focused on pursuing positive change globally, it has now turned the spotlight upon itself to understand better the Second Track and the neurological processes that drive it.

The Second Track brings groups of disparate stakeholders and subject experts together to discuss, recommend and implement initiatives to address complex problems or 'wicked' issues[4] in a safe and sound environment. Wicked social, economic or political problems tend to frustrate traditional 'first track' administrative solutions because they cross different government jurisdictions, affect powerful or deeply entrenched vested interests or are intertwined with other, seemingly intractable, problems.

Experience suggests that GAP's Second Track circumvents some of the barriers to discussing and implementing solutions for several reasons. Participants attend voluntary and individual capacity, rather than representatives of particular interest groups, and drawn from a wide range of stakeholders. While each may be an expert in their field, the groups' discussions – reported under the Chatham House rule of non-attribution – encourage a franker and broader exchange of information and ideas. Fluid agendas, the ability to create and accomplish tasks, and the implied requirement to adopt as well as advocate change also encourage a more 'open-minded' and practical approach.

While the opportunity to progress particular agendas attracts participants, exploring the hidden psychological drivers that produce the positive group interactions empowered by the Second Track may help explain its high rate of successful outcomes.[5]

Exploring the hypothesis that the Second Track changes the way participants consider issues through the positive neurological feedback it engenders may prompt future research, encouraging the method's wider adoption to complement traditional 'first track' approaches. The links this paper draws between the Second Track and ongoing streams of neurological research may also encourage the use of Second Track groups by researchers investigating the mysterious neurobiology[6] of human social interactions.

The objective testing of participants' physiological reactions in Second Track groups, alongside similar monitoring of subjects in other forms of groups and committees, could in the future support the proposition that a Second Track process is indeed more effective than other approaches because its format is aligned with our natural desire for positive group interaction.

Emergent Communities of Practice: A complexity theory lens[7] by Peter Massingham, Catherine Fritz-Kalish and Ian McAuley, published in the

3. Fritz-Kalish, 2019
4. Kolko, 2012
5. GAP initiatives have led to a number of policy reforms at both state and national level and the creation of several permanent institutions including the Centre for Social Impact.
6. Neurobiology is a subset of both physiology and neuroscience and explores the operations of the brain and nervous system.
7. Massingham et al., 2020

previous edition of *BESS*™, viewed GAP's Second Track process as an 'emerging type of community of practice'. While this group-based, outcome-oriented framework is instructive, the unique power of the Second Track can be explored through the positive and often unconscious psychological effects and benefits it brings to its participants.

As concrete, real-world outcomes can take months or years to eventuate and may not reward particular participants in any tangible way, it may be the unconscious benefits produced by the process itself in the participants' brains that maintain and encourage their involvement. The chemical rewards produced by the brain, and the spirit of positive human interaction, cooperation and open-mindedness they encourage, may hold the clue to the success of a Second Track's 'group brain'.

After examining the unique factors which differentiate GAP's Second Track from other types of meetings that might claim to produce similar rewards, this paper outlines several recent experiments on both animal and human subjects, in both laboratory and real-world settings, which uncover a range of observable, physical mechanisms for this positive feedback to occur.

WHAT DIFFERENTIATES THE SECOND TRACK?

> **'Coming together is a beginning, staying together is progress, and working together is a success.' – Henry Ford**

An exploration of the neuroscience underpinning the Second Track's effectiveness should begin by differentiating GAP's approach from other types of meetings, inquiries, collaborations and committees.

There is no shortage of worthy committees, inquiries and multi-sectoral groups considering the full range of 'wicked' social, economic and environmental problems facing Australia. However, these lengthy discussions often produce recommendations of tried and failed solutions, with an absence of any responsibility to implement these changes by participants.

While the difficulty of such issues naturally precludes a simple solution, the institutional ineffectiveness of traditional approaches may result from the obstacles the form and the content of these discussions present to positive human interactions. The progress made through the Second Track in diverse sectors with thousands of participants over two decades suggests GAP's approach has developed to overcome many of the barriers that frustrate other approaches, regardless of the individuals or institutions involved.

There is nothing new about collaboration between different groups and stakeholders in a particular sector to achieve jointly agreed ends. However, these tend to be organised by official bodies with well-resourced staff to do much of the heavy lifting. The relative lack of funding for unofficial GAP groups may have proved a blessing in disguise by forcing reliance on the skills, experience and personalities of those who volunteer to participate, rather than subcontracting responsibilities to staff. Furthermore, the lack of official sanction allows participants to ponder 'off the wall' solutions and forces them to consider implementing these solutions themselves.

While less structured in content than 'first track' processes, Second Track groups have a more formalised format than most communities of practice, and their discussion aims to produce concrete projects, policy and pilots, rather than continue the debate as an end in itself. They are consciously created, their participants are expressly invited, and a chair is appointed to run

a limited number of scheduled meetings, although participants are also encouraged to communicate offline. A secretariat then summarises these discussions and the minutes distributed to members to inform further consideration, unlike informal communities of practice whose discussions are seldom summarised or aggregated.

While a range of other meeting and collaboration formats – from office brainstorming and company project teams to parliamentary sub-committees – may appear similar to GAP's Second Track, GAP's method is distinguished by several unique factors.

Traditional collaborations tend to be between organisations rather than individuals, for example. While GAP's Second Track groups invite experts from business, academia and government who may well have served on traditional committees, these people represent only themselves within the GAP process rather than their companies, departments or organisations. This demands a more significant measure of individual commitment to the group and its aims, and, as Vince Lombardi[8] notes, 'Individual commitment to a group effort – that is what makes a teamwork, a company work, a society work, a civilisation work'.

This freedom tends to attract individuals who may hold powerful positions but also seek alternative approaches. It also implies a willingness to embark on new activity on common ground, rather than defending old battle lines, as participants are volunteers rather than appointees, have no official standing and receive no direct financial remuneration.

The nature of the Second Track turns every participant, no matter how eminent, into a learner and speaker and forces them to acknowledge the gaps in their understanding of a complex issue and expand on their experience of any particular facet. As Patrick Lencioni, the author of *The Five Dysfunctions of a Team, A Leadership Fable,*[9] observes, 'Teamwork begins by building trust. Furthermore, the only way to do that is to overcome our need for invulnerability'.

The Second Track's generation of ideas differs from traditional 'brainstorming' because the group is initially invited to raise critical problems to be solved within a broader discussion of the group's central issue. Brainstorming, by contrast, tends to involve members of a single department being asked to suggest a range of solutions to a tightly defined problem, presented to them by a person in authority in a single session.

This 'blank page' agenda allows grassroots issues to be identified and considered without the constraints and blindspots imposed by participants' 'day jobs'. Unlike traditional think tanks, participants are expected to help implement their recommendations, often through standalone projects or pilots, to prove their potential to policymakers rather than simply call for more public spending.

Many intelligent, capable and civic-minded professionals in both the public and private sector begin their careers with idealistic plans to change the world, which are soon frustrated. Other people may only come to realise the failings of particular systems and processes after long years of experience. Some attendees promote a particular vested interest – an approach the Second Track acknowledges and embraces, given its motivating power.

The Second Track gives all of them a safe opportunity to express long-held opinions or create fresh ideas free from their day-to-day constraints. The recording of minutes under the Chatham House rule of non-attribution[10] and the confidential

8. Vincent Thomas Lombardi (1913-1970) was an American football coach, and executive in the National Football League.
9. Lencioni, 2002
10. Chatham House, https://www.chathamhouse.org/about-us/chatham-house-rule

nature of these discussions encourage people to speak their minds without fear or favour. This initial frankness is a crucial part of the Second Track process, as 'politeness is the poison of collaboration', in the words of Edwin Land.[11]

The 'safe space' offered by the Second Track can therefore refresh curiosity about the views of others, encourage a holistic, rather than a partisan, view of the issues at hand, and rekindle creativity suppressed by the demands of careers and institutions. More fundamentally, the mere process of being heard and acknowledged by their peers, as outlined later in this paper, is in itself precious for group attendees.

By dispensing with hierarchies – a radical step in itself – Second Track groups are forced to assess the ideas they generate by their merit, rather than prejudging them by the eminence of their source. As the group decides which ideas to pursue, they are more likely to remain engaged with them, as they cannot devolve responsibility to others. This opportunity for self-actualisation may be a rare experience for even the group's most senior members and becomes all the more valuable for that. It also means that the best ideas tend to be selected rather than those which align with pre-existing agendas or long-established ideas.

The non-official nature of the group and its ability to act outside existing boundaries ease the cognitive dissonance participants may feel when forced to confront the contradictions between their official positions and personal convictions. It also encourages personal relationships and common commitments with like-minded people they might never have met or seen only as rivals or opponents.

Although Second Track groups are outcome-oriented rather than debating societies and are encouraged to pursue several projects themselves, they differ from standard project teams in defining and creating their ends and activities, rather than delivering a given set of goals with a larger organisation. Members of project teams tend to hold the same formal role through their lifecycle, and the team is inevitably broken up once their particular task is completed. In contrast, the activities of Second Track members and the groups evolve, often continuing into an implementation phase or morphing into other groups or permanent institutions.

Just as the minutes and reports generated from those minutes are non-attributable, the group's achievements, rather than credit for particular individuals, are paramount. The absence of manoeuvring for career advancement also helps increase group solidarity, and 'It is amazing what you can accomplish if you do not care who gets the credit', as Harry Truman[12] once said.

The unique facet of GAP's Second Track frees participants to discuss a wide enough range of topics to create a holistic view of any given issue. Its members are invited as individuals, but they remain elite groups, as participants are chosen for their experience and decision-making ability across the sector at hand. Unlike other groups, these participants define specific points of leverage where progress is both practical and possible and turn their own words into deeds. At all times, the group's chair acts as a facilitator, encouraging involvement from all, rather than a controlling hand steering the group to rubber-stamp a preconceived conclusion.

Significant though these differences are, they are not the fundamental reasons why Second Track groups succeed. Instead, these processes and procedures are effective because they have evolved to provide further scope to more fundamental neurological drives in the individuals within them.

11. Edwin Herbert Land (1909-1991) was an American scientist and inventor, best known as the co-founder of the Polaroid Corporation.
12. Harry S. Truman (1884-1972) was the 33rd president of the United States from 1945 to 1953, succeeding upon the death of Franklin D. Roosevelt after serving as the 34th vice president. He implemented the Marshall Plan to rebuild the economy of Western Europe, and established the Truman Doctrine and NATO.

THE PSYCHOLOGY OF GROUP INTERACTIONS

> **'Man is by nature a social animal... Anyone who either cannot lead the common life or is so self-sufficient as not to need to and therefore does not partake of society is either a beast or a god.' – Aristotle**[13]

John Donne observed that no man is an island,[14] and scientific research substantiates this long-held poetic truth. Humans are social[15] and empowered by language and the culture it helps create. This aspect of our nature has been the key to success, from hunting mammoths in the distant past to building mega-cities and the internet. Charles Darwin observed that in 'the long history of humankind (and animal kind, too), those who learned to collaborate and improvise most effectively have prevailed'.[16] In the more prosaic view of American industrialist Henry Ford, 'if everyone is moving forward together, then success takes care of itself'.

The complex yet subtle electrical and chemical processes in the human brain which produce and manage these social interactions are less well understood, mainly because physical dissection of a deceased brain can only go so far in helping us understand its operation. Michio Kaku notes that 'the human brain has 100 billion neurons, each neuron connected to 10 thousand other neurons', which means that 'the most complicated object in the known universe' is 'sitting on your shoulders'.[17] It may be true that if the human brain were simple enough to understand fully, we would be too simple to understand it, but great strides have been made towards comprehending its structure and myriad operations in recent years.

Unfortunately, most observations of the living brain have been undertaken on single subjects in controlled laboratory conditions due mainly to the cumbersome monitory machinery required for objective recording of brain functions. Given our social nature, it can be supposed that human brain functions would be observed in groups interacting in real-world conditions.

Advances in portable and less invasive monitoring technology are now allowing researchers to pay increasing attention to understanding the neural basis of social cognition and behaviour, as well as individual brain functions. Scientists in this exciting new field of social neuroscience are using non-invasive neuroimaging to identify the brain structures, chemicals, and biological circuits that underlie social cognitive processing. By doing so, the types of human interaction increase or decrease these impulses and secretions.

Individuals are hard-wired to survive and will put their interests ahead of the group in many circumstances, but as naked apes lacking the teeth, strength and speed of other predators, we evolved to depend on successful group dynamics to prosper and thrive. It, therefore, seems logical that our brains would evolve to reward positive and productive group interactions.

Despite this, most group behaviour studies have focused on the psychological and physiological forces that drive individual aggression and group competition with outsiders or other entities rather than positive cooperation. The study of outliers, diseases and unusual events may be more exciting, but the most critical area of study should be the everyday and commonplace. Given that humanity's evolutionary advantage lies in our ability

13. Aristotle, written around 350 BC
14. Donne, 1988
15. The Cooperative Human, 2018
16. Satterfield, 2013
17. Kaku, 2014

to cooperate and communicate within groups towards shared goals, it would seem more useful for researchers to use their new technology to focus on activities – such as the Second Track – which encourage positive cooperation and allow groups to become so much more than the sum of their parts.

The study of humans in real-life situations explains why many satisfying abstract theories fail to explain or predict human behaviour. Man is made of crooked timber indeed. Classical economics, for example, is based on the not unreasonable assumption that individuals will act rationally to pursue their economic interests. However, this theory also assumes perfect knowledge and market flexibility in the graphs it then draws, meaning the straight lines on paper will only hint at trends in real life rather than entirely explain them.

While Marxist economics scorns individual decision-making, it also assumes that classes defined by their role in the economy will act rationally in their interests, with the proletariat constrained only by the 'false consciousness' created by the ruling elite. In the real economy, people act for all kinds of personal and sometimes illogical reasons, or, conversely, soon find ways to 'game the system' for less than altruistic ends, creating unintended and usually adverse consequences for even the most well-meaning of policy initiatives.

Daniel Kahneman won a Nobel prize by exploring how human psychology affects economic decision-making, and the attention paid by policymakers and marketers to 'behavioural economics' and the potential to 'nudge' citizens or consumers in particular directions by subtle environmental or psychological clues suggests that its potential is permeating the rest of society.

Similarly, a better understanding of the real human drivers of group interactions, above and beyond the actual issues they debate, may help groups cooperate more effectively and achieve more practical ends. The Second Track works through a process of trial and error, shaped by experience rather than prior theoretical assumptions, but after 20 years of experiment, fomenting a theory of Second Track interactions should allow these processes to be consciously honed in the future and applied productively elsewhere.

Published almost a decade ago in 2011,[18] Kahneman's *Thinking Fast and Slow* explains[19] how our powers of reason and emotion battle to control our behaviour. The book describes a slew of errors in memory, judgment, and decision-making, relying on impulsive 'gut feelings' can produce. However, given the effort which intellectual focus requires, most of us rely on instincts honed for the African savannah rather than the Australian city more often than we should. Humans are animals, rather than androids, risen apes, not fallen angels, in the phrase of Richard Dawkins.[20] We are diverse, impulsive and contradictory as individuals, whatever our achievements in groups. However clever we may think of ourselves, we are still prone to rely on thumb heuristics, which makes us see simple patterns in complex systems and lead us fatally astray.

John Stuart Mills' rational *homo economius*[21] would not differentiate between the risk of losing $100 to gain $100, for example, but the long-dormant hunter-gatherer in us remembers that a bird in the hand is worth two in the bush. So we still prefer to hold what we have and remain suspicious of change[22] if a new pasture harbours a tiger. This

18. Kahneman, 2013
19. Holt, 2011
20. Richard Dawkins is a British ethologist, evolutionary biologist, and author.
21. Wilson, 2018
22. Loss aversion is an important concept associated with prospect theory and is encapsulated in the expression 'losses loom larger than gains' (Kahneman and Tversky, 1979).

deep-seated aversion to loss has political and social implications, as people will tend to be less willing to embrace reforms than rationality suggests they should. This simple evolutionary imperative may speed the downfall of many traditional groups, as their members cling to long-held beliefs and interests rather than pursue mutually beneficial changes. Second Track groups, by explicitly divorcing participants from their traditional roles, at least ease these ties to the past, freeing individuals to seek change they also have the power to deliver.

However, once again, while individuals ostensibly participate in Second Track groups to explore issues of interest to them, forward a particular cause, solve an institutional problem or even seek commercial opportunities, they are not paid directly for their time, and not every group generates companies which participants become a part of. Second Track groups may well be more productive than other types of committees and task forces, but the reasons why people participate – and, most tellingly, why people tend to stay engaged throughout the one- or two-year Second Track process and join multiple groups over the years – must have deeper psychological drivers.

Mutually satisfying interactions between people and within a convivial group produce positive emotional states, as we evolved as social animals who relied on successful group dynamics for survival. We join sports clubs, choirs and civic groups as much for the bonds of friendship we create and the satisfaction of pursuing a purpose larger than ourselves as the activity itself. By recognising and fostering the network effect of participants' contacts, the Second Track multiplies its power to deliver results. However, it is the individual connections that people generate – notably the *Pacific Connect* community created by the International Centre for Democratic Partnerships[23] – which deepens individuals' involvement in the Second Track group.

In a world of texts and smartphones, the power of Second Track's emphasis on face-to-face meetings (albeit on hiatus given the social distancing required during the COVID-19 pandemic), should not be underestimated. Indeed, the value of real-life interactions, held in close physical proximity, rather than distanced by technology or an overly large group, is a feature of some of the experiments outlined below.

It is easy to ignore or dismiss information one may dislike when presented in the form of a news article or paper. Indeed, the algorithms that shape our social media and YouTube feeds expressly avoid confronting us with unfamiliar perspectives or contrary views. Organisations will also have a 'party line' about issues they are deeply engaged with, but only through a particular or partisan lens. An in-person roundtable discussion with individuals from every part of a sector, but without hierarchies or set agendas, forces participants to engage with their fellow human beings, which demands at least consideration of their opinions.

Rather than prepare and read out statements for the record, individuals in a Second Track group are encouraged to engage in a free-flowing discussion whose ends none of them can predict with any certainty. This ability to shape the form, content and result of the debate increases individual engagement, and therefore the pressure for group cohesion, to a much greater degree than more structured and impersonal 'first track' processes.

Positive group interactions and pleasurable social experiences have well-documented health benefits. As well as temporarily elevating one's mood, such experiences shown to relieve long-term depression, reduce blood pressure and even mitigate against cardiac disorders. However, as previously noted, most studies in socio-biology have concentrated on individuals or the interaction of two individuals,

23. Blackshaw, 2020

rather than groups; pathological rather than normal mental states; and aggression rather than cooperation. While autism, personality disorders, and schizophrenia are important and debilitating conditions, there is another place to understand normal human interactions.

Academia's emphasis on original publication also means that the conclusions of up to two-thirds of papers in psychology and other social sciences fail to be replicated by subsequent experiments instead of being peer-reviewed in terms of process.[24] Sweeping conclusions are often drawn from animal studies which may have little or no relevance to more complex human interactions. Scientific studies of the social interactions during the Second Track should balance these extremes and prove valuable as the issues under discussion.

Most mammals live in family groups, at least for a time, and other highly successful animals like bees, ants and termites are social to such an extreme extent that each colony effectively operate as a single mega-organism with thousands or even millions of members. Even bacteria and trees can recognise and effectively communicate with each other to some extent. Though millions of people may congregate in a city, we retain far more individuality than that. While we are inherently social on a small scale, such congregations are not natural to us. We find it difficult to remember and maintain more than 100 personal contacts, the size of a Stone Age tribe, regardless of the technology at our fingertips today.

Second Track groups tend to maintain around a dozen members, although individuals may join and leave over time. Just as we balance reason and emotion in our lives, our primitive social urges manage affiliation and aggression by establishing hierarchy and territoriality. Second Track taskforces break down existing affiliations, forcing us to reconsider our place and role in a new grouping.

Although they offer an alternative to current institutions and consultation methods, Second Track solutions tend to be rooted firmly within the current system. To remain practical within tight budgets, they tend to be evolutionary in nature and small in scale, at least as pilot measures. However, a Second Track body is an anarchist in nature, a self-organising group relying on a spirit of mutual aid to achieve common goals without authoritarian leadership. While meetings are organised for a particular date, and the chair may call the meeting to order and ensure the broad points on the agenda are addressed, members shape the discussion themselves, and the opportunity the Second Track groups give to participants to express themselves socially, as well as rationally, is part of their attraction and success.

Our social interactions are vital to every aspect of our lives, and a better understanding of the neural factors which shape our social behaviour could help address a range of social problems in itself, from crime and violence to racism and neglect of the most vulnerable. Understanding the brain chemistry that drives aggression has led to selective serotonin reuptake inhibitors (SSRIs) to curb impulsive, dangerous, and aggressive behaviour. Low levels of serotonin, for example, tend to increase the number and severity of bouts of aggression,[25] and supplements given to animals can make previous combatants make peace and groom.

These effects are complex, however. Increased serotonin levels make male monkeys more dominant in the hierarchy, and similar results are seen in human studies. For example, healthy participants who were given SSRIs proved to be both more dominant and cooperative during

24. Harris, 2018
25. Seo et al., 2008

mixed-motive games in one study.[26] Conversely, the depletion of serotonin led to less cooperation during a 'prisoner's dilemma' exercise, as participants rejected more offers that disadvantaged their fellow players, even when this potentially disadvantaged them.[27]

Real-life studies of social behaviour often employ the 'ecological momentary' method of assessment,[28] which plots behaviour on a graph with axes of agreeable–quarrelsome and dominant–submissive. When researchers gave different groups of people a placebo or two or three weeks of tryptophan,[29] a substance that supports serotonin production, the latter were duly found to be less quarrelsome and more dominant than their unmedicated peers.[30] Pleasurable human interactions can naturally boost serotonin, so participants in the Second Track may be more productive because they are both more agreeable in terms of the discussion and more dominant in implementation than in traditional and less enjoyable meetings.

Animal studies of the brain compound oxytocin[31] indicate its importance in forming close bonds between mates and mothers with offspring, as it increases each animal's willingness to defend others from a threat. Laboratory studies of healthy people show that it tends to increase our trust in others too. Oxytocin is another chemical that tends to be expressed due to positive interactions, again offering a mechanism by which positive Second Track interactions may prove more productive than their 'first track' equivalents.

One of the problems in studying the neurobiology of human social behaviour lies in the difficulty of objective measurement. Most studies in the past relied on people's assessment of their mood, actions and behaviour in real-life situations, a metric that is prone to misinterpretation. However, when assessing the results of behaviour rather than brain chemistry, bespoke studies involving different groups of similar individuals invited to consider a simple problem and – importantly – implement an effective solution could be more valuable.

Groups of people could be given the task of crossing a lake or other obstacle, for example, with a range of supplies at their disposal. One group could be 'chaired' but organised in a 'second track' manner without previous titles or formal hierarchy, while a more formal procedure could be outlined for another, with a third given no instructions at all. If the Second Track group consistently agreed on a practical solution and implemented it more efficiently than other groups, it would speak to the practical value of the approach.

Groups tend to exacerbate, rather than moderate, positive and negative traits that individuals might display in the same conditions.[32] Although any individual might run for the exit if caught alone in a building when a fire alarm goes off, for example,[33] people are more inclined to stay put – or panic completely – if surrounded by others doing the same. The bystander effect,[34] in which people in groups are less willing to help a stranger than they would be alone, is well known, as is people's

26. Tse and Bond, 2002
27. Wood et al., 2006
28. Ecological momentary assessment (EMA) involves the repeated sampling of the subjects' experience and behaviour in real time in their everyday environment. EMA eliminates recall bias, maximises ecological validity, and allows the study of microprocesses which influence behaviour in real-world situations which laboratory-based experiments may miss.
29. *Tryptophan is an essential amino acid which not only regulates infant growth and adult nitrogen balance but also creates niacin, a building block of the neurotransmitter serotonin.*
30. Jenkins et al., 2016
31. Oxytocin is a hormone secreted by the posterior lobe of the pituitary gland, a pea-sized structure at the base of the brain. It is popularly termed the 'love hormone' as it is produced when people cuddle or socially bond.
32. Radburn and Stott, 2009
33. Patrick, 2018
34. The bystander effect means people are less likely to help a distressed stranger if others are present. First proposed in 1968, it suggests that groups cohere into a state of shared and mutual denial through the diffusion of perceived responsibility.

propensity to riot if others around them give them social license by doing the same. Group dynamics, such as the Second Track, which have been honed over time to promote cooperation towards common ends, might also have the same effect on participants in a more beneficial direction, encouraging more positive behaviour and actions than would be the case if they were alone or in a more hostile or formal group setting.

The search for effective, practical ways to improve group dynamics is important. The infamous Milgram experiment[35] saw groups of students willing to deliver significantly more severe electric shocks to their playacting victims than individuals acting alone. Groups playing the Prisoner's Dilemma – a thought experiment that rewards trust and invites individual 'cheating' for personal advantage – also tend to be more cut-throat than individuals playing with each other. Discussions on social and political issues tend to include more 'fear and greed' statements if held in groups than if individuals are interviewed alone, and so it is vital for any group format to exacerbate positive rather than negative aspects of group behaviour.[36]

If the individuals within a group disagree on a common end and do not work cooperatively towards it, then they soon become less than the sum of their parts. The great success of Second Track groups is that they form a 'group brain' which is greater than the sum of its parts. While they generate ideas through discussions that no individual would produce due to greater exposure to the experience and ideas of others, a range of investigations into the nature of the 'social brain' outlined below offer more fundamental explanations of their effectiveness and appeal.

THE SOCIAL BRAIN[37]

> **'The proper study of mankind is man.'**[38]
> **– Alexander Pope**

For all but the last few decades of human history, the workings of our brains have remained a mystery. Indeed, our understanding of the universe around us developed far more quickly than our comprehension of the organ with which we understand the world. The brains' workings can be discussed in terms of metaphors,[39] given their innate complexity and the difficulty of studying something that we are studying. In the modern day, our brains are often seen as computers, for example, although the functioning of a living brain and a silicon chip has less in common than may first appear.

Neuroscience has traditionally focused on studying neurons or networks of neurons within individual brains by monitoring a subject asked to undertake a task alone in laboratory conditions. Monitors of various kinds then generate images of brain activity which indicate the complex neural processes that allow our brains to perceive, understand and act on sensory data.

While this has proved a helpful foundation in our modern quest to understand ourselves, simultaneous studies of humans interacting with each other in real-life situations are now coming to the fore. For example, there have been few studies that even attempt to explore the complex brain chemistry involved when two people talk to each other, let alone groups of ten or a dozen, in a roundtable discussion, and so the field is ripe for expansion.

35. McLeod, 2017
36. Massachusetts Institute of Technology, 2014
37. The social brain is defined as the complex network of areas in our brain that allow us recognize others and evaluate their mental state, intentions, feelings and actions.
38. Pope, 1733-34
39. Presentation on Metaphors and Historical Conceptions of the Brain, University of California San Diego, http://mechanism.ucsd.edu/~bill/teaching/w12/philneuro/metaphorsandconceptionsofbrain.key.pdf

'We spend our lives having a conversation with each other and forging these bonds,' says neuroscientist Thalia Wheatley of Dartmouth College, but 'we have very little understanding of how it is people actually connect. We know almost nothing about how minds couple.'

This glaring gap in human understanding is beginning to be closed by a new generation of neuroscientists using sophisticated but portable and user-friendly technology to monitor and analyse the interactions of two individuals and larger groups. These studies have begun by looking at groups of people engaging in eye contact, storytelling or the joint consideration of an object or topic, but the unique dynamics of Second Track groups should offer a rich source of future studies, as the new field of interactive social neuroscience continues to develop.

Over and above the valuing of one method of committee organisation above another, such studies could help define the neural underpinnings of real-time real-life social interactions and improve our understanding of communication in the most fundamental terms. This might improve everything from education and training to the quality of political discourse – all issues that GAP Second Track taskforces have considered.

Previous generations of brain imaging machines required the subject to remain entirely still for long periods, and scientific rigour seemed to demand a strict level of environmental control which could only be maintained in the lab. Despite these practical barriers, the first successful attempt to study the functions of two brains interacting at the same time took place nearly 20 years ago.

Physicist Read Montague placed two subjects in different magnetic resonance imaging machines – more commonly used in hospitals – observe their brain activity as they played a competitive but straightforward game. Although they had to lie motionless in their respective machines, one person could send a signal to the other indicating whether they had just seen a red or green bulb light up, while the other had to guess whether or not they were telling the truth. In monitoring the differences and similarities of their brain functions simultaneously, he essentially invented the process he termed 'hyper-scanning'.[40]

Researchers soon adopted similar strategies, and the term now covers any brain imaging research involving more than one subject. Rather than place people in MRI scanners, today's researchers use various techniques, including electroencephalography (EEG) monitors,[41] magnetoencephalography[42] and functional near-infrared spectroscopy[43] to monitor activity in the brain. As the technology becomes less cumbersome and invasive, more people can be studied in more realistic situations, producing more practical results.

The hypothesis that Second Track groups become a *gestalt*[44] (collective brain) that can produce more robust results than other groups or individuals can now be tested in terms of brain function and practical outcomes. Participants might be monitored in Second Track and other types of group to see how well their brain waves synchronise, for example.

Several studies hint at ways that a Second Track group's 'social brain' might be investigated. One such piece of work, for example, appears to back one

40. Presentation by R. Montague, Professor, Department of Physics, Virginia Polytechnic Institute and State University, at TED, *YouTube*, 2012, https://www.youtube.com/watch?v=ufUkAQOQaXU
41. Electroencephalography (EEG) is a method of electro-physiological monitoring which records the electrical activity of the brain through non-invasive electrodes placed on the scalp.
42. Magnetoencephalography (MEG) maps brain activity by recording the magnetic fields produced by electricalcurrents occurring naturally in the brain, using highly sensitive magnetometers.
43. Functional near-infrared spectroscopy (fNIRS) indirectly measures neuronal activity in the cortex through neuro-vascular coupling.
44. 'Gestalt' is German for 'unified whole'. The initial Gestalt Principles were proposed a century ago by the German psychologists Max Wertheimer, Kurt Koffka and Wolfgang Kohler to explain how the human mind constructed order from myriad sensory perceptions. The concept of seeing individual elements as a whole and this being, in the words of Koffka, 'other than the sum of the parts.' has come to denote a group or hive mindin Science Fiction literature and the popular imagination.

of the driving tenets of the Second Track in finding that cooperation tends to be driven by self-interest rather than empathy for others. The Second Track has always emphasised the importance of self-interest in driving engagement in its processes. This pursuit of self-interest need not be at the expense of fellow participants – indeed, as Napolean Hill observed, 'it is literally true that you can succeed best and quickest by helping others to succeed'.[45]

From the University of Pennsylvania, the study offers a neurological explanation of the Second Track's rule of thumb that an appeal to self-interest can be more productive than pure altruism. It found that self-serving strategy, rather than empathy for other group members, seems to underlie much of the cooperative behaviour observed in most primates.[46] Several rhesus macaques were taught to play a computer game of 'chicken'[47] – no mean feat in itself – and soon learned ways to maximise results and rewards. Two monkeys playing against each other, for example, would cooperate to avoid crashing into each other and losing, but if just one monkey played against the computer while the other watched, then the watching monkey employed a different strategy to maximise rewards for itself at the expense of the other.

'We found that neurons in a part of the brain [previously] linked to strategic thinking, but not in a part of the brain linked to empathy and shared experience, respond selectively when rhesus macaques cooperate,' commented Wei Song Ong, the postdoctoral neuroscience researcher at the University of Pennsylvania, who led the study.

While this does not mean that cooperation cannot be motivated by empathy or consideration for others, it does tend to indicate that, at its root, much of our ostensibly sophisticated cooperation with each other is driven by primitive instincts of self-interest. By acknowledging this reality, rather than obfuscating or ignoring it as other multidisciplinary groups tend to do, the Second Track may free people to pursue their interests more honestly and openly, increasing their commitment to tangible outcomes. This acknowledgement may increase trust between participating individuals, as there is no hidden agenda to be suspicious of.

Like those of the Second Track, the cooperation generated in successful groups could also have a neurological source in the mirroring or synchronisation of brain function. Indeed, the unconscious mirroring of brain activity may be a part of how animals, including humans, interact to form social bonds. A group led by Dr Miguel Nicolelis, a professor of neuroscience at Duke University School of Medicine in North Carolina, investigated this notion fascinatingly. He invented a rhesus monkey to remotely drive a vehicle to gain a piece of fruit while being watched by another monkey.[48] Every time the monkey driving the cart won a piece of fruit, the watching primate was similarly rewarded.

The scientists found that the brains of the two monkeys became synchronised as one carried out, and the other watched the activity. Indeed, Nicolelis reported that up to 60% of the neurons in the motor cortexes of both monkeys fired simultaneously.[49] Significantly, this synchronisation

45. American educator, author, orator, and Presidential adviser Booker T. Washington perhaps phrased the same idea with a little more grace in saying 'If you want to lift yourself up, lift up someone else.'
46. Platt et al., 2016
47. Wilson, 2017
48. Nicolelis, 2013
49. Ramakrishnan et al., 2017

grew as the first monkey drove closer to its reward or, in a follow-up experiment, as the second monkey control the vehicle remotely. This 'group brain' effect may help explain how animals of all kinds manage to undertake group tasks of apparently great complexity, as well as the 'group brain' effect of Second Track groups, while Nicolelis suggested that antisocial neurological disorders such as autism may be the result of an individual's inability to establish such inter-brain synchronisation.

'We can no longer think of brains in isolation,' Nicolelis said. 'The 'social brain' idea that we are talking about supersedes the notions that (scientists) have developed for brains in isolation because the brain is not just a passive device alone in the world. […] The action on one animal involves the actions of other animals.'

Neuroscientist Uri Hasson of Princeton University also explored the capacity of brains to synchronise by scanning a person who was asked to tell a story and noticing that another individual produced similar results when listening to a recording of the tale.[50] 'The brain of the listener becomes similar to the brain of the speaker,' Hasson observed, and further work proved that the more aligned the brains of speaker and listener were in terms of brainwave responses, the greater the listener's reported comprehension. Hasson concluded that 'Your brain as an individual is really determined by the brains you're connected to.'

Hasson is now partnering with Professor Wheatley at Dartmouth in the USA to measure the 'coupling' of brains during a conversation.[51] A good conversation, notes Wheatley, involves 'creating new ideas together and experiences you could not have gotten to alone'.[52] Second Track groups multiply that effect by involving 10 or 12 people in the same conversation, and this network effect may significantly increase its potential for the generation of new ideas.

Their work involves subjects in scanners in each institution connected online. The subjects take turns to construct a story together, making it up a few lines at a time, and a workable hypothesis might be that the creativity and fluidity of the story will vary with the synchronicity of the brains involved. The use of portable EEG machines to monitor the synchronicity produced by individuals in Second Track meetings might also show a relationship between brain synchronicity and agreed and productive outcomes.

Several studies conducted on humans in real-life situations have been performed with portable EEG machines. They also show that people's brainwaves become synchronised in the audience of concerts, films or other shared mass experiences. A series of studies in New York City high schools,[53] performed by a team of New York University researchers including Suzanne Dikker and Ido Davidesco, has produced even more exciting results. Repeated EEG readings from every student in a biology class over a term showed that the students' brainwaves became more synchronised in direct relation to their engagement in their lesson. Furthermore, this synchronicity increased concerning the amount the students liked each other and their teacher. In short, closer relationships and more engaging lessons lead to more synchronisation. An ongoing study is currently examining whether these levels of brain synchrony during class predict the retention of material learned.

Again, this may have direct relevance to the Second Track, as its free-flowing format and the other ways it drives engagement may similarly increase this brain synchronisation effect.

50. Lerner et al., 2011
51. Hasson et al., 2012
52. Denworth, 2019
53. Dikker et al., 2017

INTER-PERSONAL ENGAGEMENT

> **'Alone we can do so little; together we can do so much.'**[54] **– Helen Keller**

The Second Track allows experts, practitioners and decision-makers from different spheres to engage with each other in a safe shared space without the hierarchical and organisational boundaries which normally divide them. The new research introduced above is helping to reveal why this personal approach is so critical in building social links, encouraging personal engagement and generating personal satisfaction, which keeps members coming back and pursuing work together.

Psychiatrist and social neuroscientist Leonhard Schilbach of the Max Planck Institute of Psychiatry in Munich argue that 'social cognition is fundamentally different when you are directly engaged with another person as opposed to observing another person'.[55]

In 2010, for example, psychologist Elizabeth Redcay and Rebecca Saxe of the Massachusetts Institute of Technology[56] placed a subject inside an MRI scanner which then interacted with a researcher sitting by the scanner or through a video feed. Their experiment showed that the live interaction activated the areas of the brain associated with social cognition and rewarded far more than the recorded session.

Redcay's subsequent studies have shown that children's brains engage more of the regions associated with empathy – thinking about the mental states of others, or mentalising as it is called – when they believe they are communicating with peers rather than others.[57] The Second Track, by stripping participants of their prior job titles, although not their expertise, explicitly makes everyone a peer on the same level in the meeting. Adults also have more empathy with others when they see them as peers and are more willing to adjust their attitudes, increasing the chance of cooperation towards a common goal.

Redcay's studies of joint attention also suggest that the mentalising regions of the brain, such as the temporal-parietal junction,[58] respond differently when people concentrate on something as a group, rather than an individual, again perhaps strengthening the 'group brain' of Second Track processes.

Schilbach has found in his studies of 'second-person neuroscience'[59] that even simulations of attention are enough to trigger a positive response. The perception that one's behaviour affects another person, even in as trivial a way as returning a gaze, is enough to trigger the brain's reward circuitry in the ventral striatum.[60]

54. In the early 1920s, Helen Keller and her teacher Anne Sullivan eased their precarious finances by performing on the vaudeville circuit. According to the joint biography *Helen and Teacher: The Story of Helen Keller and Anne Sullivan Macy* by Joseph P. Lash, published in 1980, their 20 minute 'act' saw Keller deliver a short speech which included these lines: 'My Teacher has told you how a word from her hand touched the darkness of mymind and I awoke to the gladness of life. I was dumb; now I speak. I owe this to the hands and hearts of others. Through their love I found my soul and God and happiness. Don't you see what it means? We live by each other and for each other. Alone we can do so little. Together we can do so much. Only love can break down the walls that stand between us and our happiness.'
55. Denworth, 2019
56. Redcay et al., 2010
57. Alkire and Redcay, 2019
58. The temporal and parietal lobes of the brain meet at temporoparietal junction, situated at the posterior of the lateral sulcus (Sylvian fissure). The TPJ incorporates information from the thalamus and the limbic system as well as the body's visual, auditory and somatosensory systems.
59. Schilbach et al., 2013
60. The ventral striatum forms part of the brain's basal ganglia and limbic system and appears to be a vital part of the human brain's 'circuitry' for decision making and reward-related behaviour.

'The so-called mentalising network and the action-observation network seem to be much more closely connected (than previously supposed)', says Schilbach. 'They influence each other, sometimes in a complementary and sometimes in an inhibitory fashion.'[61] Formal meetings which inhibit the free flow of interpersonal interaction in favour of rigid bureaucratic procedures are not only less rewarding than second track interactions, but dampening natural human interactions in favour of bureaucratic procedures may have a repulsive effect.

As with Track II diplomacy,[62] the agreement and implementation of policy on complex or 'wicked' problems that cross departmental boundaries and involve a range of stakeholders depend greatly on strong personal relationships to overcome institutional divides. The importance of 'looking people in the eye' during potentially fraught discussions or tense negotiations found more validation in the work of Norihiro Sadato of Japan's National Institute for Physiological Sciences in 2019. He used hyper-scanning to prove that eye contact prepares the 'social brain' to empathise with the other person by activating the same areas of each person's brain simultaneously.

This synchronised response includes the cerebellum, the reasoning part of our brains which helps us predict the sensory consequences of actions, and our limbic mirror system, a set of brain regions that activate when we move our body – or our eyes – and when we observe another person's movements. The limbic system allows us to recognise emotions and share them with others, creating our capacity for empathy.

CONCLUSION

> **'Everything we do, every thought we've ever had, is produced by the human brain. But exactly how it operates remains one of the biggest unsolved mysteries, and it seems the more we probe its secrets, the more surprises we find.' – Neil deGrasse Tyson**

One of these surprises may be that probing the mysterious brain chemistry that drives and shapes our social interactions could lead to a fundamental reappraisal of how we organise groups and joint activities. This research shows that individual neurological reactions in social interactions are crucial in human communication and cooperation,[63] and rigorous, independent scientific studies of interactions in Second Track and other types of groups would seem a logical next step.

Such studies – which might combine behavioural observation, psychophysiological investigations and computational approaches in line with the Second Track's multidisciplinary approach – could explore interactions in real-life situations from the participants' point of view, rather than 'offline' studies shaped by the perceptions of observers. Investigating and understanding the Second Track's effect on emotional engagement might offer clues to its capacity to improve participant engagement and project outcomes in a wide range of applications.

Results from a range of objective tests and monitoring equipment could generate the complex data required to test the hypothesis that the Second Track tends to produce more favourable results for individuals, and therefore more productive results for groups than more formal 'first track' approaches. However, the parallels between this research and GAP methods, as well as the demonstrable success of Second Track groups and GAP itself, already suggest a positive result.

61. Denworth, 2019
62. Track II or backchannel diplomacy involves the interaction of non-state actors, or sometimes diplomatic discussions in informal settings, with a view to conflict resolution.
63. Hari et al., 2015

REFERENCES

Alkire, D. and Redcay, E. (2019), Understanding Other Minds; What happens in our brains when we interact with people?, retrieved from ResearchGate Online https://www.researchgate.net/publication/334618961

Blackshaw, B. (2020), The Second Track and Talanoa: Implementation of the Pacific Connect programme in the Pacific Islands, *BESS*™, vol. 2, no. 1, June 2020, https://www.globalaccesspartners.org/publications/Blackshaw_GAP_Journal_BESS2020.pdf

Denworth, L. (2019), 'Hyperscans' Show How Brains Sync as People Interact, *Scientific American*; https://www.scientificamerican.com/article/hyperscans-show-how-brains-sync-as-people-interact/

Dikker. S., Davidesco, I., Wan, L. and Kaggen, L. (2017), Brain-to-Brain Synchrony Track Real-World Dynamic Group Interactions in the Classroom, *Current Biology* 27 (9), https://www.researchgate.net/publication/316530998_Brain-to-Brain_Synchrony_Tracks_Real-World_Dynamic_Group_Interactions_in_the_Classroom

Donne, J. (1988), No Man Is an Island, Souvenir Press Limited

Fritz, P. (2019), Second Track to Success, *BESS*™, vol. 1, no. 1, August 2019, https://www.globalaccesspartners.org/publications/Fritz_GAP_Journal_BESS2019.pdf

Fritz-Kalish, C. (2019), Twenty years on the Second Track: GAP case studies, *BESS*™, vol. 1, no. 1, August 2019, https://www.globalaccesspartners.org/publications/FritzKalish_GAP_Journal_BESS2019.pdf

Global Access Partners (2021), Initiatives, https://www.globalaccesspartners.org/think-tanks

Hari, R., Henriksson, L., Malinen, S. and Parkkonen, L. (2015), Centrality of Social Interaction in Human Brain Function, *Neuron* 88 (1)

Harris, R. (2018), In Psychology and Other Social Sciences, Many Studies Fail the Reproducibility Test, retrieved from National Public Radio; https://www.npr.org/sections/health-shots/2018/08/27/642218377/in-psychology-and-other-social-sciences-many-studies-fail-the-reproducibility-te

Hasson, U., Ghazanfar, A. A., Galantucci, B., Garrod, S. and Keysers, C. (2012), Brain-to-brain coupling: a mechanism for creating and sharing a social world, *Trends in cognitive sciences* 16 (2): 114–121

Holt, J. (2011), Two Brains Running, *The NY Times*, https://www.nytimes.com/2011/11/27/books/review/thinking-fast-and-slow-by-daniel-kahneman-book-review.html

Jenkins, T.A., Nguyen, J.C.D., Polglaze, K.E. and Bertrand, P.P. (2016), Influence of Tryptophan and Serotonin on Mood and Cognition with a Possible Role of the Gut-Brain Axis, *Nutrients* 8 (1): 56

Kahneman, D. (2013), Thinking, Fast and Slow, Farrar, Straus and Giroux, reprint edition

Kahneman, D. and Tversky, A. (1979), Prospect Theory: An Analysis of Decision under Risk, *Econometrica*, Vol. 47, No. 2 (Mar 1979), pp. 263-291

Kaku, M. (2014), The Future of the Mind: The Scientific Quest to Understand, Enhance, and Empower the Mind, *Doubleday*

Kolko, J. (2021), Wicked Problems: Problems Worth Solving: A Handbook and Call to Action

Lencioni, P. (2002), The Dysfunction of a Team: A Leadership Fable

Lerner, Y., Honey, C.J., Silbert, L.J. and Hasson, U. (2011), Topographic mapping of a hierarchy of temporal receptive windows using a narrated story, *Journal of Neuroscience* 31 (8):2906–2915

Massachusetts Institute of Technology (2014), When Good People do Bad Things: Being in a group makes some people lose touch with their personal moral beliefs, *Science Daily*, https://www.sciencedaily.com/releases/2014/06/140612104950.htm

Massingham, P., Fritz-Kalish, C. and McAuley, I. (2020), Emergent Communities of Practice: A complexity theory lens, *BESS™*, vol. 2, no. 1, June 2020, https://www.globalaccesspartners.org/publications/Massingham_etal_GAP_Journal_BESS2020.pdf

MayoClinic (2021), Selective serotonin reuptake inhibitors (SSRIs), retrieved from https://www.mayoclinic.org/diseases-conditions/depression/in-depth/ssris/art-20044825

McLeod, S. (2017), The Milgram Shock Experiment, *Simply Psychology*, https://www.simplypsychology.org/milgram.html

Montague, R. (2021), What we're learning from 5,000 Brains, TED presentation, retrieved from YouTube, https://www.youtube.com/watch?v=ufUkAQOQaXU

Nicolelis, M. (2013), A monkey that controls a robot with its thoughts. No, really; TED presentation, retrieved from YouTube, https://www.youtube.com/watch?v=CR_LBcZg_84

Patrick, N. (2018), The Reasons People Ignore Fire Alarms, retrieved from FireCo, https://www.fireco.uk/3-reasons-people-ignore-fire-alarms/

Pfieffer, U.J., Timmermans, B., Vogeley, K., Frith, C.D. and Schilbach, L. (2003), Towards a Neuroscience of Social Interaction, *Frontiers in Human Neuroscience*, https://doi.org/10.3389/fnhum.2013.00022

Platt, M.L., Seyfarth, R.M. and Cheney, D.L. (2016), Adaptations for social cognition in the primate brain, *Philosophical transactions of the Royal Society of London*, Series B, Biological sciences 371 (1687)

Pope, A. (1733-34), An Essay on Man: Epistle II, retrieved from The Poetry Foundation https://www.poetryfoundation.org/poems/44900/an-essay-on-man-epistle-ii

Radburn, M. and Stott, C. (2009), The Psychology of Riots – and Why it's Never just Mindless Violence, *The Conversation*, https://theconversation.com/the-psychology-of-riots-and-why-its-never-just-mindless-violence-125676

Ramakrishnan, A., Byun, Y.W., Pedersen, C.E., Lebedev, M.A. and Nicolelis, M. (2017), Cortical neurons multiplex reward-related signals along with sensory and motor information, *Proceedings of the National Academy of Sciences of the United States of America* 114 (24): E4841–E485

Redcay, E., Dodell-Feder, D., Pearrow, M.K., Mavros, P.L., Kleiner, M., Gabrieli, J.D. and Saxe, R. (2010), Live face-to-face interaction during fMRI: a new tool for social cognitive neuroscience, *NeuroImage* 50(4): 1639–1647

Satterfield, D. (2013), The Origin of Species – Charles Darwin, *The Leader Maker*, https://www.theleadermaker.com/the-origin-of-species-charles-darwin/

Schilbach. L., Timmermans, B., Reddy, V., Costall, A., Bente, G., Schlicht, T. and Vogeley, K. (2013), Toward a second-person neuroscience, Cambridge University Press

Seo, D., Patrick, C.J., and Kennealy, P.J. (2008), Role of Serotonin and Dopamine System Interactions in the Neurobiology of Impulsive Aggression and its Comorbidity with other Clinical Disorders. *Aggression and violent behaviour*, 13 (5): 383–395

The Cooperative Human (2018), *Nature Human Behaviour*, Issue 2, https://www.nature.com/articles/s41562-018-0389-1

Tse. V. and Bond, A. (2002), Serotonergic intervention affects both social dominance and affiliative behavior, *Psychopharmacology,* 161 (3): 324–30

University of California San Diego, presentation on Metaphors and Historical Conceptions of the Brain, http://mechanism.ucsd.edu/~bill/teaching/w12/philneuro/metaphorsandconceptionsofbrain.key.pdf

Wilson, C. (2017), Monkeys learn to play 'chicken' in a virtual driving game, *The News Scientist*, https://www.newscientist.com/article/monkeys-learn-play-chicken-virtual-driving-game/

Wilson, R. (2018), What is Homo Economicus?, *Investopedia*, https://www.investopedia.com/ask/answers/08/homo-economicus.asp

Wood R.M., Rilling J. K., Sanfey, A.G., Bhagwagar, Z. and Rogers, R.D. (2006), Effects of tryptophan depletion on the performance of an iterated Prisoner's Dilemma game in healthy adults, *Neuropsychopharmacology* 31 (5): 1075–84

ARTICLE

HOW DO WE SOLVE WICKED PROBLEMS? EFFECTIVE CROWD MANAGEMENT

Andrew Tatrai

When modern visualisation techniques are used to depict real-time changes in crowd behaviour, their movement resembles the dancing landscapes of complex adaptive environments. Researcher Andrew Tatrai describes the exciting possibilities offered by new monitoring technologies to improve crowd management.

INTRODUCTION

The science of emergence, the mechanics of complexity and the links to the understanding and building robust artificial intelligence are increasing at an accelerated rate. So much so, there is a need to prescribe some generally accepted techniques to solve the multidisciplinary problems or define an approach for previously unsolvable situations. The community of practice and Second Track processes are designed to consider these broader views beyond traditional science silos to create new knowledge on complexity, social and intelligence horizons.[1]

Wicked problems built on causal relationships are partly ignored due to the dominance of statistics that summarise data but do not interpret it. The issue with wicked problems is that we can understand the causal inference by tinkering (in the words of Judea Pearl) with the factors that affect the result but cannot build the mathematically explicit models required to emulate the solutions to these common and recognisable problems.[2]

1. Massingham et al., 2020
2. Pearl and Mackenzie, 2018

The application of complexity theory and complex adaptive systems has provided insight; however, the traditional metrics cannot often model change. Advances in technology offer new tools to view the complexity lens. This research reviews a wicked problem of crowd management and applies the methodology to define, model and solve crowd management intervention technics based on new views, new metrics and modern technology. A multidisciplinary approach was taken, drawing on psychology, sociology, mathematics and computer science.

As the world becomes crowded, effective crowd management is essential for every organisation responsible for safety, yet the literature is fragmented in theory and practice for solutions across the broad range of crowd behaviours. This paper introduces concepts that improve our understanding of crowd behaviour and new tools to improve the management of crowds.

THE NATURE OF CROWDS

The origins of crowd theory can be traced back to the late 1800s when psychology and psychologists played a leading role in developing models of human behaviour. Friedrich Nietzsche wrote, touching on some of the vagaries of crowd observations, '[i] n individuals, insanity is rare; but in groups, parties, nations and epochs, it is the rule'.[3] There are two philosophical pathways of thought. Type 1 suggests that the presence and interaction of people in crowds develop a group mind, separate from and overruling individual rationale. This has become the leading paradigm in foundation theory, despite some sociologists arguing that it lacks the nuanced approach to consider both aspects of irrationality and other influences that align with behavioural theory. Type 2 suggests that individuals in the crowd develop, share and proliferate their traits to form the crowd. These twin theories provided the foundations for academic exploration of thought.

In the last six decades, crowd theory was influenced by general management theory. Smelser, in 1962 provided an alternative view of the ability of a crowd to apply rational decision making.[4] This prompted a wave of research from scholars such as McPhail, who wrote about 'the myth of the maddening crowd'.[5] The idea of the crowd as a rational group gave rise to directional and informative crowd control techniques that include simple rules such as informing crowds of limits, issues, ethics and required behaviours. These concepts have been applied in practice, for example, by British police to look at crowd eruptions as responses to socioeconomic problems and how dialogue and negotiation can keep the peace.[6] Consistent with crowd behaviour, not all situations aligned with this theory; Gorringe and Rosie point to the failure of this strategy in the 2011 London riots. These advances have been unable to explain why crowd behaviour can present as disproportionate or erratic outputs.

The complexity approach is based on recognising that crowd behaviour is emergent, as interacting factors and conditions and interrelationships between various influences can produce various responses. Crowd behaviour is a complex situation that requires a systems-oriented approach, and managing crowds requires an understanding of changes in the emergent behaviour and the factors that influence those changes.

3. Nietzsche and Faber, 1998
4. Smelser, 2013
5. Smelser, 2013; McPhail, 1991
6. Gorringe and Rosie, 2011

COMPLEX ADAPTIVE SYSTEMS AND WICKED PROBLEMS

Emergent behaviour is an advancement of systems thinking that replicates how nature develops changes and new forms emerge. Changes, agents, rules and the environment all affect the result or output. The emergent behaviour concept fits crowds because the behaviour of a system emerges from the structure of its parts, and a crowd's behaviour cannot easily be predicted or extrapolated from the behaviour of those individual parts. Emergent behaviour refers to how complex systems and patterns arise out of a multiplicity of relatively simple interactions, and thus, it cannot be predicted by linear or inflexible theory. Emergent behaviour looks remarkably like crowd structures, with bottom-up changes driving adaptive responses.

Complex adaptive systems embrace the self-organising feature common in nature and society. The mathematical foundations of complex adaptive systems are credited to John Holland, working in genetic algorithms. Other scholars such as Axelrod[7] showed that complexity could be applied to social science issues such as developing a culture in organisations. Complex systems are systems made of many microscopic components interacting with each other in nontrivial ways. Characteristics of complexity are noted as interdependent and diverse entities that can adapt and respond to their local and larger environment. Complex systems have broad and non-scientific descriptors to illustrate changes over time. Page[8] presents dynamic and fluid reactions of complex systems as dancing landscapes changing over time. Crowd behaviour is portrayed to adapt and move over time. Crowd behaviour is characterised by constant change, self-organisation and feedback loops that cause non-linear responses. Like other complex systems, crowds are unpredictable and can produce significant disproportionate responses (e.g., crowd panic in reaction to a gunshot or during crowd evacuation). Complex systems produce bottom-up phenomena, in which the actions of the individual members become the group's actions. The adaptive response of crowds to agents and actors points to emergent behaviour.

The essential purpose of crowd management is to ensure that crowds stay safe and in a neutral or positive mood and to achieve this, emergent behaviour needs to be kept within the boundaries that are acceptable and desirable in the given situation. At one end of the scale, this may be about maximising the experience for an audience, and at the other, about the containment of disruptive or dangerous behaviour. To control emergent behaviour is to direct the development of a complex adaptive system, which simplifies complexity, which is a wicked problem by definition. As Webb[9] notes, 'wicked problems … [are made up of]… interrelated components of organised complexity … [which] cannot be solved in isolation from each other'. They are found when a single theory or paradigm does not identify the nature of complexity; its difficulty and length have defined complexity to describe and model the relationships between components. While some systems can be modelled sufficiently, social sciences can still not quantify and identify the many influencing factors within complex adaptive systems, hence stalling the modelling applications until new techniques became available. Research needs to provide quantitative data for crowds as a social system by utilising the latest advances in digital technology to collect and analyse that data.

7. Axelrod, 1997
8. Page, 2015
9. Webb, 2006

CROWD MANAGEMENT

There are two aspects to crowd management – structural and dynamic – and both apply whether the crowd is in a stadium, shopping mall, music festival, conference, railway station, or any other place where people congregate in large numbers. The structural aspect covers the physical situation – the capacity, layout, entrances and exits, pathways, focal points – as well as the temporal dimension – the schedule of activities within that space. A good design and plan, adequately funded and carefully implemented, is the first essential step in effective crowd management. The more significant difficulties lie in the dynamics of the moment, for the mood and behaviour of a crowd will change over time and may change rapidly, producing a dangerous situation. A crowd is not a simple unit that will behave predictably but an aggregate of individuals and groups of individuals, who will act, react and interact in an infinite variety of ways. A crowd is a complex adaptive system, and as we have noted, the effective management of complexity is intrinsically a wicked problem.

Several practitioners have supported the psychological approach. One of the most practical guides for crowd management comes from UK psychologists who developed a series of guides and supporting evidence for understanding crowd behaviour.[10] Given that psychology includes definitions of a person's mental characteristics or attitude, its rise to dominance, in theory, is not surprising. While psychology continues to dominate the study of crowd theory, other disciplines bring their unique perspectives to the field. For example, Brewer and Wollman[11] argue: 'It is sociology as a discipline that best understands crowd behaviour', noting that 'crowd behaviour is dynamic in unpredictable ways, and reason and motive disappear when crowds move unpredictably'.

A multidisciplinary approach suggested by Challenger et al.[12] acknowledges the role of other disciplines in crowd management, highlighting that real-time systematic observations and expert knowledge are vital to an effective stimulation model, as most simulation tools are not based sufficiently on research literature, and proposes that future simulation tools need to include groups of people within groups, individuals' emotions, and the interface between people and traffic.[13]

DETERMINANTS OF CROWD BEHAVIOUR: DENSITY AND MOVEMENT

Crowd behaviour is affected by many factors: actors, agents, external environmental factors such as light, sound, signage and intoxication, and internal drivers of grouping and mindset, to name a few. On the theme of starting with superficial causal relationships that can be measured, this research uses two well-researched metrics of crowd density and flow rate as inputs having a causal relationship on the crowd behaviour output of mood. The three are interlinked, and each is subject to a range of externalities and human pressures. Effective crowd management relies upon a quick assessment of and response to these factors. Crowd management practice has remained fundamentally unchanged for some years. It relies essentially on the experience of crowd managers and the robustness of their teams. Crucial to this is the experience of the crowd managers and the surveillance they have over the crowd: they must assess density, velocity and mood. Making these assessments have improved over time, and the industry is taking great strides forward at present.

10. Challenger et al., 2009
11. Brewer and Wollman, 2011
12. Challenger et al., 2009
13. Challenger et al., 2009

The basic approach to real-time data collection and measurement of crowds is crowd counting. This started with subjective estimates for event attendance, which was developed by combining data relating to density and space from photos with knowledge of geographical areas multiplied across sectors and layers.[14] These methods come from the desire to confirm event attendance at, for example, protests and marches but are viewed as inaccurate, the primary flaw being that the angle from which a photograph is taken has a significant bearing on the estimate. Some researchers have tried to adapt old methods to modern applications, using drones to estimate event attendance with the Jacobs method.[15] Subjective measures have been accepted for practical applications until better techniques were developed.

Crowd counting expanded into planning guides for safe crowd density and capacity calculations. Practical guides became the foundation for event planning capacities. The *British Guide to Safety at Sports Grounds*, also known as the *Green Guide*, assists crowd managers to reference and calculate safe capacities. The 2018 *Green Guide* mentions density (as a function of capacity) 23 times without providing a measurement method other than estimation.[16] These guides are widely used in pre-event planning and post-event or incident analysis but are not applied to dynamic moving crowds. Simple changes, such as entrance gateways becoming reduced, cannot be anticipated in pre-event planning. Stationary pre-planning guides cannot anticipate the multiple scenarios real crowds produce.

Data collection for crowds also comes from observations of, and interviews with, actual participants. These studies provide background to the issues and concerns of attendees but fail to explain the interaction of the agents in a crowd or how the behaviour can be consistently modelled. Authors such as Boghossian and Velastin[17] note the inefficiency of human observations of crowds for study purposes, citing inaccuracies and the inability to compute multiple variances. Whilst human observation can reiterate situations frequently, cognitive limits point to the necessity of machine data collection.

The design of smart cities has increased crowd management research applications. For example, the need to increase pedestrian signal road crossing times when large crowds are present can be detected and actioned by camera analysis. This method uses visual shape recognition for individuals tracked by using a Kalman or particle filter. Advances in image and vision computing to measure crowd density and template-based tracking include the work of Idrees et al.,[18] who analyse instant crowd flow and density calculations without prior contextual training of instrumentation required. This is an example of management leading technology advances.

DETERMINANTS OF CROWD BEHAVIOUR: MOOD

The mood is rarely mentioned in crowd management literature, though as crowd management practitioner Bob Quintella of the Oakland Coliseum notes, 'to keep management from crossing over into crowd control, one of the most important things to do is correctly assess the mood of the crowd'.[19] Recently, these lines of thought were restricted as there was no method

14. Jacobs, 1967
15. Choi-Fitzpatrick and Juskauskas, 2015
16. Department of National Heritage, 2018
17. Boghossian and Velastin, 1999
18. Idrees et al., 2014
19. Waddell, 1997

'to assess the crowd's mood'. Crowd mood research has been restrained by designing large-scale research projects without mood measurement devices.

The mood is hard to define, and its complexity is created by the multiple influences of external and internal stimuli. Lazarus describes the mood as 'a transient reaction to specific encounters with the environment, one that comes and goes depending on particular conditions'.[20] Moods are subtle and often not self-recognised as an impact on self-behaviour.[21]

Crowd mood definitions reflect the uncertainty of mood understanding. Barsade and Gibson[22] suggest that although group emotion has no standard definition, the ebb and flow of emotion affect crowds both from the individual to the group and from the individual.[23] Their model shows that group emotion causes a feedback loop that affects individual moods, which in turn rebalance the developing group mood; this appears similar to the influences of emergent behaviour. It has only been in the last three-five years that quantitative mood and emotion analysis has been possible.[24]

Crowd mood measurement and research have yet to receive significant academic attention. The literature reflects the lack of research to sanction mood measurement or the use of facial expressions as an accurate representation of mood. This may be because the mood is viewed as layered complexity, or techniques have not been developed to measure facial features for mood comparison. Despite broad reading in mood research, Skinner's behavioural approach provides a vague link to mood and facial expression by epistemic interpretation. Skinner's philosophy on behaviourism suggests to only measure what can be proved. Hence facial features such as smiles and frowns are valid substance. Behaviourism also supports the concept that the environmental factors received by the crowd affect the mood of the crowd.[25] If we can simplify mood to what can be inferred from observed facial features, it can be measured using the currently available technology.

THE TECHNOLOGY

This investigation uses new technology to measure density, flow and mood in a crowd simultaneously, and it is the measurement and analysis of all three factors, together, in real time that makes this approach uniquely valuable as a tool for crowd management. The software developed by Dynamic Crowd Measurement Pty Ltd combines programs to record all three metrics, working from data collected by CCTV[26] cameras. Dynamic Crowd Measurement (DCM) is a Sydney-based technology start-up that has developed commercial software to measure crowd characteristics and model crowd data. The software visualises the interrelationship between density, flow and mood as a three-dimensional regression model in near real-time, showing the phase changes and tipping points as well as the effect of intervention or crowd management.

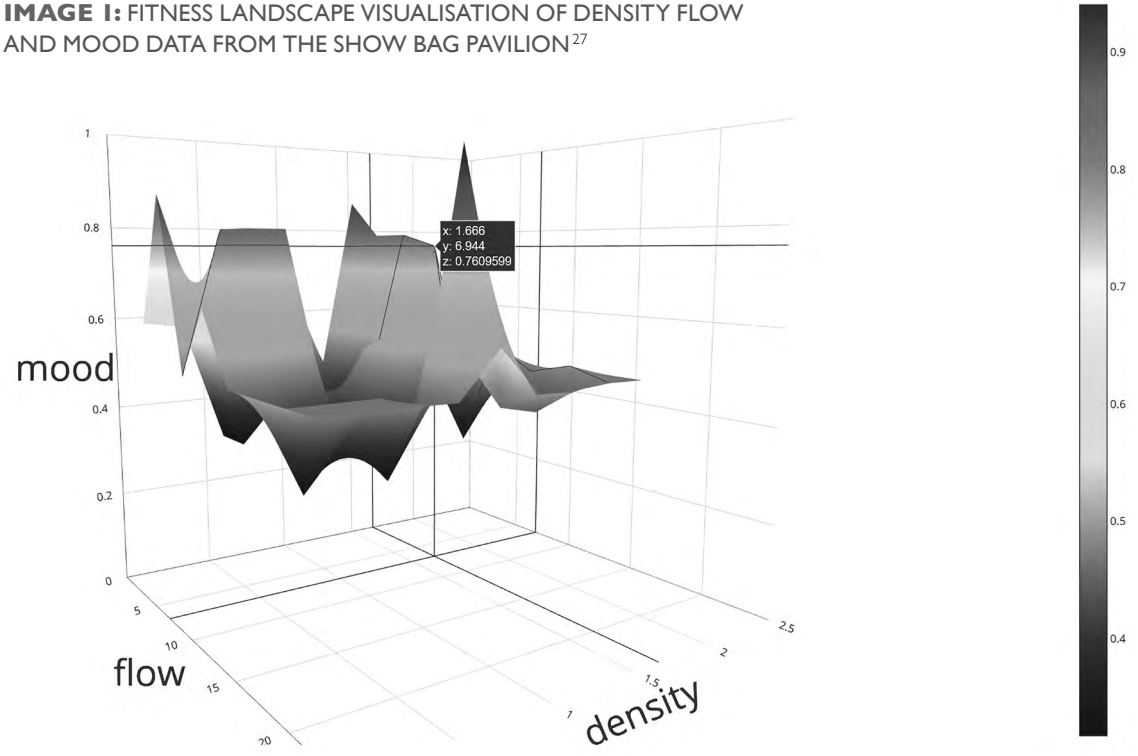
Headcount, density, flow and mood were measured, then analysed and presented in various formats. The operational managers on the ground required a condensed and visual interpretation of the data. The three metrics of Density, Flow and Mood (DFM) are modelled in a data visualisation technique called a fitness landscape, which effectively maps the complexity of the DFM relationship.

20. Lazarus, 1991, p.47
21. Forgas, 1992
22. Barsade and Gibson, 2012
23. Barsade et al., 2018
24. Barsade et al., 2018
25. Catania and Harnad, 1988
26. Closed-circuit television (CCTV), also known as video surveillance

The image below displays density in the X-axis, flow in the Y-axis and mood as the vertical axis, with colour gradients to show the increase in negativity climbing towards value 1. After consultation with crowd managers, this orientation was chosen to recognise the red colour, and the high peak symbolised the escalating seriousness of the situation. The blue or cool colours denote positive mood as valleys below 0.5 or neutral mood score.

Management action could modify the crowd mood, and intervention was conducted. The test was designed as a controlled situation to accentuate the visual results and connect the action on the ground with the timestamps on the data frames. Typically, if density increases and the flow reduces, the mood should be negative, so access to the pavilion was deliberately reduced. Over repeated sequences, the width of the door entries was reduced from 8 metres (fully open) to approximately 2 metres. The constriction caused an increase in density and a reduction of crowd flow. Correspondingly, and with a very short lag in response, the measurement device noted changes in crowd mood, shifting to

IMAGE 1: FITNESS LANDSCAPE VISUALISATION OF DENSITY FLOW AND MOOD DATA FROM THE SHOW BAG PAVILION[27]



27. From the Show Bag pavilion, 19 April 2019. The display can be rotated in 3D, and magnified as needed so that all parts of the model can be examined. Image credit assistance from Ruoxiang Wen, DCM data scientist. https://dcmtenant.s3-ap-southeast-2.amazonaws.com/10000000-0000-0000-0000-000000000000/dcm-dfm-data-plotting/version1/test_data_3d.html

negative. This demonstrated the sensitivity that the measuring device was able to provide. When the access ways were reopened to their full width, allowing density to reduce and flow to increase, the mood plateaued (as noted in Image 6) and relaxed back to a neutral than positive position. The real-world response was that people were happy they could enter without restrictions and congestion, and therefore the crowd mood changed.

In summary, the pilot data sampling at the Royal Easter Show confirmed the concept that crowd mood can be managed by controlling density and flow. It shows that the relationship between density, flow and mood is dynamic and non-linear despite the repeatability of the situations and outcomes. The variance of the influences is a symptom of complexity. Complexity theory explains this relationship more accurately than traditional management theories.[28]

A further test was applied to crowd management practice to test the validity of the DCM data measurement instrument. The next phase was data collection and management in a more complex environment.

PILOT STUDY 2: METHODS AND RESULTS

Wicked problems are known for their complexity, so a second real-life study was designed to explicitly test if crowd management could make changes in density and flow to manipulate mood in a public crowd. The hypothesis provided was, 'When do pedestrians become a crowd, and when does a crowd need crowd management?'. A statement like this is more relevant for wicked real-world problems and reflects the objectives of the crowd management practitioners.

Pilot study 2 was at the VIVID Sydney Light Walk 2019. This Destination NSW (DNSW) event attracted over 2.3 million patrons in 2019. It stimulates the Sydney night-time economy and promotes the iconic Sydney Harbour, Opera House and Sydney Harbour Bridge. DNSW makes a substantial investment in overseas marketing to attract visitors to Sydney for the event in mid-winter. It wants visitors to have a pleasant experience at VIVID because this increases the value of the overseas marketing spend by supporting it with positive word-of-mouth referrals and comments.

VIVID Sydney Light Walk has a complicated event footprint, with artist installations straddling the Rocks Precinct and Circular Quay and stretching to the Royal Botanic Gardens. The walking route conflicts with patrons and commuters arriving at the Circular Quay transport hub. Crowd management difficulties include urban infrastructure and buildings that create bottlenecks and construction projects. As the event is free and un-ticketed over 23 days, predicting crowds based on past attendance is difficult. This uncertainty has required high levels of crowd staffing to cope with worst-case numbers on numerous event days, which has a financial impact.

This stage of the testing did not include any deliberate modification as prompted in the pilot study test but used the 'natural' variation in the arrival and circulation flows of the crowds. This is referred to as 'in the wild', signifying non-modified and non-laboratory conditions in standard terminology. It was, therefore, a test for management application. Travis Semmens, an experienced associate and the crowd security manager for the VIVID event, supported the technology and security guidance and response implementation. Cameras and observers were placed at the bottleneck points at West Circular Quay, East Circular Quay, and the Rocks' Cutaway. The aim was to monitor changes that cause negative mood impacts and use this information to allow crowd managers to deploy crowd calming techniques. Once management response scenarios

28. Goulielmos, 2002

IMAGE 2: TESTING BOXING IDENTIFICATION WEST CIRCULAR QUAY SYDNEY DURING VIVID 2019

were devised and staff were briefed, the mood levels were calibrated to match the concern of the consulting, and the measuring instrument started.

Initial observations noted the novelty of the information to crowd managers. It was apparent that the technology is far more sensitive than human assessment, requiring crowd managers to build trust in the measurements before they could start to believe and react to the measurement advice. Consultation with crowd management and police noted that the technical data, while interesting, was not easily understood. A quick reference guide was required to reduce the information provided to focus on actionable areas, and a dashboard was developed with simplified colour codes and heat mapping to reflect real-time changes in mood for rapid responses.

USING NEW METRICS TO SOLVE WICKED PROBLEMS

This research, and the broad and general research question describing a wicked problem, has identified mood measurement as a basis for practical crowd management purposes. Crowd behaviour has been linked to mood in practice before measuring and visualising the changes. The scientific evidence that management intervention to change crowd density and flow affects mood provides a quantitative base

for management decision support. Once mood can be measured, consistent, repeatable and large-scale crowd management decisions can be developed.

This research proves mood can be monitored and measured. Technology to measure mood changes is far more efficient than subjective human cognition. When mood changes are visualised as peaks and valleys, crowd managers can see the objective of crowd management rather than interpret and 'feel' the mood changes. It becomes positive guidance. The ability to measure these characteristics advances crowd management understanding and causality.

The data can visualise the phase changes and tipping points in crowd mood. Pilot study 1 provided crowd managers with evidence of mood escalation to estimate causality and instigate intervention to manage mood. The predictive capability of crowd managers was enhanced by near real-time information flow. This is a significant advancement from traditional crowd management; however, it became apparent that a mathematically explicit model could use the slope angles and formula of mood visualisation to extrapolate or predict mood change, tipping points and phase changes. Pilot study 2, in a less controlled environment, provided the opportunity for crowd managers to practise using the technology and respond within a timeframe to maintain crowd mood. In addition, the use of technology dashboards allowed crowd analytical information to be disseminated to event organisers, police, transport authorities and other stakeholders. Potentially, even attendees could receive a heat map of crowd congestion at events by logging into an app or portal to allow self-organisation, depending on their tolerance and desire to avoid crowded areas. This is a considerable advancement for crowd and event management.

Data visualisation identifies forms. The most exciting discovery from the research is the visualisation of the changing crowd data from pilot studies 1 and 2. The moving data in real time resembles the dancing landscapes of complex adaptive environments described by Page.[29] The crowd mood visualisation parallels many features of complex adaptive systems. Dramatic peaks grow, move and sink into valleys as emergent behaviour, represented by mood, is influenced by changes to density and flow.

Real-time visualisation shows the efficiency of computer detection and mapping. The pilot studies showed how machine computation amplified changes beyond experienced crowd managers' ability. The technology was significantly more sensitive than human observation. The mood measurement can be applied to classify all crowds, from simple crowds of pedestrians or spectators to diverse and complex crowds at gatherings to the chaos of riots and disorder. At the extremes (e.g., stable pedestrian crowds and riotous disorder), the mood is measurable and assists in the identification. However, it is the area that Page[30] notes as 'he interesting in-between', described as complex, or on the edge of chaos, that benefits the most from mood measurement. This research focuses on complex crowds where the dynamic features of complexity and the dancing landscapes leap into life with the new data collection technology. Mood measurement has opened significant volumes of academic research on complexity and complex adaptive systems that can now be applied to crowd management.

29. Page, 2011
30. Ibid.

The similarities between complex adaptive systems and crowds are extensive. Complexity theory is still nascent, so caution is applied in labelling this as a perfect description for crowd science. However, there have been a small number of focused applications of complexity theory in crowd science. Goulielmos[31] claims complexity theory 'describes life better than the hitherto available theories, as it deals more effectively with dynamic, non-linear and cyclical phenomena'. It follows that once the measurement has allowed the complexity of the relationship to present itself, a management framework can be selected and applied.

A NEW DEFINITION OF CROWD MANAGEMENT BASED ON MOOD MEASUREMENT

Wicked problems require new definitions. The diversity of crowd theory has led to various definitions and practices, and similarly, crowd management practice is poorly defined. Single academic theories do not extend to crowd management definitions, and definitions from practitioners vary extensively.

To solve wicked and practical problems, a solution needs to define all aspects of the practice clearly. These are the definitions that arise from the research.

1. **Strategic definition:** 'Crowd Management is the observation and modification of crowd mood to meet meet the event's objectives or place managers'.
2. **Tactical definition:** 'Crowd management maintains crowds in a neutral or positive mood'.
3. **Operational definition:** 'Crowd management modifies external environmental factors such as density and flow to balance the crowd's mood for the objectives desired. Crowd density, flow and mood are influenced by external environmental conditions, including available space, information, numbers, light, sound, weather, the presence of actors and agents (police, security, crowd marshals or stewards), internal factors such as groups' emotions, and the effect of alcohol or drugs. Ultimately the final measurable output is the averaged crowd mood. If crowd mood is prevented from becoming negative, then crowd management is a success.'

USING THE FINDINGS TO IDENTIFY A MANAGEMENT FRAMEWORK

For a solution to be considered valid in the real world, the last piece of the jigsaw puzzle should fit an existing management framework. Complexity theory can be coupled with the ordered and unordered states of crowd behaviour. The data from this research has been able to offer a delineation between ordered and unordered states. An ordered state is aligned with a neutral mood, while an unordered state can be found at the extremes of both a negative or a positive mood.

The established Cynefin Management Framework has a good fit for crowd management and has shown practical applications in strategic police management, where a range of situations present the need for a measured approach based on the complexity of the response.[32]

31. Goulielmos, 2002
32. Snowden and Boone, 2007

TABLE 1: COMPARING SNOWDEN'S COMPLEX ADAPTIVE ENVIRONMENT TO CROWD SITUATIONS[33]

FROM SNOWDEN AND BOONE (SNOWDEN & BOONE 2007)	OBSERVATIONS OF CROWDS (TATRAI 2010-2020)
It involves a large number of interacting elements	**Individual and groups as agents, previous past experiences, motivation, density, crowd flow and mood and psychology, size, numbers and groups, light sound, control forces, weather**
The interactions are nonlinear, and minor changes can produce disproportionately significant consequences)	Some inputs can cause panic, reaction to peer influence or police violence. Barriers or blockages cause crush, music and alcohol can exaggerate behaviour
The system is dynamic, referred to as emergent	**Crowd behaviour can develop quickly and expectantly with the right catalysts**
The system has a history, past integrated with the present	People humans have intentionality, identities and can change the system (rebel against guidance/force) create self-generating leadership for internal groups
May appear ordered, but hindsight does not lead to foresight, because conditions continually change	**Precisely as crowds seem at times, event mass movements appear ordered until a blockage, a noise, a scare sets the crowd off in a disordered pattern**
In complex systems agents and the system constrain each other	Crowd management, crowd control, signage, lighting, other people in the crowd groups and police and external authorities all interact to influence the end output or result

KEY POINTS THAT PROVIDED A MEASURED SOLUTION TO A PREVIOUSLY WICKED PROBLEM

Advances in technology have allowed crowd features to be observed, measured and modelled in real time, and the measurement assists in understanding patterns of changes and influences. When the new data is visualised in a graphical display, the crowd scenes present the dancing landscapes typical of complex adaptive systems. Once the modelling shows phase changes and tipping points, a new perspective on management is possible. Refining and aligning a management framework to the new data is the solution for a problem, formerly only solved by human experience. If it is accepted that crowd management has been previously a wicked problem, new technology, new data, new views, and new applications is the process flow to find a new solution. This research identifies the potential link from measurement to management, and in doing so, creates a new era in crowd management that will provide transparent goals and objectives.

33. O'Toole et al., 2020

REFERENCES

Axelrod, R. (1997), *The complexity of cooperation: Agent-based models of competition and collaboration*, Princeton University Press

Barsade, S.G., Coutifaris, C.G. and Pillemer, J. (2018), Emotional contagion in organisational life. *Research in Organisational Behavior*, 38, 137–151

Barsade, S.G. and Gibson, D.E. (2012), Group affect: Its influence on individual and group outcomes. *Current Directions in Psychological Science*, 21, 119-123

Boghossian, B,A., Velastin, S.A. (1999), Motion-based machine vision techniques for the management of large crowds. Proceedings of the 6th IEEE International Conference on Electronics, Circuits and Systems ICECS, 1999. 961–964

Brewer, J. and Wollman, H. (2011), Sociologists' offer to unravel the riots', Letter to *The Guardian*.

Catania, A. and Harnad, S.E. (1988), *The selection of behavior: The operant behaviorism of BF Skinner: Comments and consequences*, Cambridge University Press

Challenger, W., Clegg, W. and Robinson, A. (2009), Understanding crowd behaviours: Guidance and lessons identified. *UK Cabinet Office*, 11–13

Choi-Fitzpatrick, A. and Juskauskas, T. (2015), Up in the Air: Applying the Jacobs Crowd Formula to Drone Imagery. *Procedia Engineering*

Department of National Heritage (2018), *Guide to Safety at Sports Grounds 6th ed.*, London, Sports Ground Safety Authority (SGSA)

Forgas, J.P. (1992), On mood and peculiar people: Affect and person typicality in impression formation. *Journal of Personality and Social Psychology*, 62, 863–875

Gorringe, H. and Rosie, M. (2011), King mob: perceptions, prescriptions and presumptions about the policing of England's riots. *Sociological Research Online*, 16, 1–6

Goulielmos, A.M. (2002), Complexity theory applied to management of shipping companies. *Maritime Policy and Management*, 29, 375–391.

Idrees, H., Warner, N. and Shah, M. (2014), Tracking in dense crowds using prominence and neighborhood motion concurrence. *Image and Vision Computing*, 32, 14–26

Jacobs, H. (1967), To count a crowd. *Columbia Journalism Review*, 6, 36–40

Lazarus, R.S. (1991), *Emotion and adaptation*, Oxford University Press on Demand

Massingham, P., Fritz-Kalish, C. and McAuley, I. (2020), Emergent communities of practice: A complexity theory lens. *Journal of Behavioural Economics and Social Systems*, 2, 17–36

McPhail, C. (1991), The Myth ofthe Madding Crowd. New York: Aldine de Gruyter

Nietzsche, F.W. and Faber, M. (1998), *Beyond good and evil: prelude to a philosophy of the future*, Oxford, Oxford University Press

O'Toole, W., Luke, S., Semmens, T., Brown, J. and Tatrai, A. (2020), *Crowd Management. Risk, security and health*, Goodfellow Publishers

Page, S.E. (2011), *Diversity and complexity*, Princeton, NJ, Princeton University Press

Page, S.E. (2015), What sociologists should know about complexity. *Annual Review of Sociology*, 41, 21–41.

Pearl, J. and Mackenzie, D. (2018), *The book of why: the new science of cause and effect*, Hachette UK

Smelser, N.J. (2013), *Theory Collectve Behav Ills* 258, Routledge

Snowden, D.J. and Boone, M.E. (2007), A leader's framework for decision making, *Harvard business review*, 85, 68–149

Waddell, R. (1997). Quintella talks crowd management: Director Bob Quintella of Oakland Coliseum, California [Online], BPI Communications

Webb, S.A. (2006), *Social work in a risk society: Social and political perspectives*, Macmillan International Higher Education

ESSAY

LEARNING FOR COMPETITIVE ADVANTAGE AND BUSINESS SUCCESS

Les Pickett

In today's world of rapid transformation and disruption, 'the survival of the fittest' is quickly becoming the survival of the most able to learn. Human capital and corporate governance professional Les Pickett looks at how organisational learning drives competitive advantage and commercial success.

The rapid change in the business environment sometimes resembles the croquet game in Alice in Wonderland. In that kind of game, every element is in motion – technology, suppliers, customers, employees, corporate structure, industry structure, government regulation – and none can be counted on to remain stable for long. It is impossible to win a game by using the old corporate forms, elaborate hierarchies and slow decision-making processes, in-house rivalries and adversarial relationships with stakeholders. These risk-averse systems crush new ideas not directly related to mainstream business and rewards geared to climbing the ladder from position to position rather than to accomplishment or contribution.[1]

Instead, to achieve sustainable competitive advantage, enterprises must continuously transform. An essential part of the ongoing transformation is to be a learning organisation. There are countless examples of organisations – Kodak is a commonly cited example – that have failed because they did not embrace organisational learning. These corporate dinosaurs cannot survive in the

1. Pickett, 1991

contemporary business environment; an essential element of future business success is organisational capability to learn.

Over recent years, economic, social and technological forces have intensified significantly, dramatically altering the work environment. These changes have occurred so rapidly, and competition has increased so intensely, that the organisational dinosaurs must adapt and learn to this new world of work or die. The survival of the fittest is quickly becoming the survival of the most suited to learn.[2]

Learning is a critical business strategy, and unless the pace and effectiveness of learning keep pace with the rate of change in our business environment, the likelihood of future success is minimised. The risk of failure and corporate collapse significantly increased.

In our globalised and complex world, human capital capability development provides us with the opportunity to utilise the most critical sustainable source of competitive advantage for our business enterprises. While there is a high level of emphasis being placed on technology, the successful workforce of the future will be driven by human endeavour.

A recent Australian survey found that only 30% of respondents were confident that their organisation currently has the skills required to meet future needs, and 39% reported they would need to upskill their current workforce over the next six months.[3]

Becoming an effective learning organisation is now one of the highest – if not the highest – business priority. Without continual learning, profits and products will no longer be possible. If the organisation is not an effective learning organisation, then skilled and committed individuals are wasted. Sustainable business success is not just about intelligent individuals. It is about intelligent organisations that are capable of learning.[4] To gain competitive advantage, companies must learn better and faster from their successes and failures. They must continuously transform themselves into learning organisations to become places in which groups and individuals at all levels continuously engage in new learning processes.[5]

Human resources are often a significant barrier to a company's success. Organisations must tailor their human resource policies to fit their chosen competitive strategy. In many ways, human resource policies form a significant part of the problem and the solution.[6] While artificial intelligence (AI) is now a part of many organisational activities and causing considerable disruption in many industries, human workers will remain central to the job market in the years to come regardless of how far AI advances. So, what are the vital human skills that will be vital in the future job market?

First, while we need technical skills, we must consider the human element involved in building and maintaining AI systems to ensure they generate real value. We need people with advanced data literacy and digital skills because AI cannot operate without human oversight. We will need experts who can interpret insights, ensure AI works efficiently, and step in to make judgement calls based on those insights. STEM[7] skills will be vital for people looking to take on the jobs that will arise out of AI and automation. Data analysts and

2. Frappaola, 2006
3. Owen, 1998
4. Goyder, 1993
5. Marquardt, 2011
6. Pickett, 1999
7. Science, technology, engineering and mathematics

scientists, software and applications developers, and e-commerce and social media specialists are just some of the many roles that will rise to prominence. People working with this technology must be adept at interpreting data, finding patterns within it, and identifying which data sets are useful for AI training.

Second, if we expect humans and machines to work in tandem, we also need human 'soft' skills; skills which AI currently do not possess. With automation increasingly taking over data processing and administrative tasks, humans will be left with responsibilities that require problem-solving, social and emotional responses, and creative thinking. We will also see an increasing need for customer service workers, human resource specialists and innovation managers – all heavily reliant on these 'human' skills. We are also likely to see the greater emphasis being placed on developing qualities like empathy, adaptability and leadership.[8]

Regardless, learning can no longer be conceptualised as a separate activity.[9] It is at the heart of productive activity. Learning professionals are now taking a more strategic and proactive role in planning and developing training aligned with business goals and improves organisational performance. Executives are increasingly recognising that training has become a competitive advantage for organisations vying for talent. Employees today want personal and professional development. They perform better and stay longer with companies that have built a strong learning culture, developing employees for their current and future roles.

Attracting and maintaining talent is not the only reason to engage in organisational learning. The business market is changing rapidly, requiring organisations to become more agile and responsive to change. Technology is only accelerating this rate of change through innovations in areas like automation and AI, so they must now reskill and upskill employees faster, deploying learning experiences that quickly close technical and soft skills gaps and prepare people for the future. Companies that proactively invest in developing their employees' data literacy are outperforming companies that do not across various metrics, including revenue growth, profitability and employee satisfaction.

The training function cannot afford to ignore this competitive advantage, and addressing the data skills gap is critical. Current competency and career research have shown that among the weakest competencies for learning and development (L&D) professionals are organisational performance analysis, performance measurement, and business and training performance assessment. L&D professionals must invest the time and resources to become data literate to prove the value of learning to business executives, then drive the development of this critical skill across the entire organisation.[10]

Future business success in a landscape where the average occupational skill has a lifespan of barely five years is one of the most significant challenges confronting today's workforce. Organisations that can overcome this obstacle gain a decisive competitive edge in their specific market. Continued relevance and competitiveness are achieved by committing to training programs and promoting an organisational culture of continuous individual development.

8. Kairinos, 2020
9. Zuboff, 1988
10. Taylor, 2020

A critical training gap presents a significant threat to organisational success and profitability, as 64% of managers don't think their employees can keep pace with future skill needs, and 70% of employees say that have not even mastered the skills they need today. This gap can be overcome by continuous learning where programs are embedded in organisations that routinely teach and refresh staff members' knowledge. This has been nominated by Australian learning and development executives as their preferred model.

One-third of Australian employees reported that they have learned a new-to-world skill in the past three years but expect around 19% of their current skillset to be irrelevant within the next three years. A means to address skills relevance is connected learning, regarded as the model of the future. It operates successfully when an individual can pursue a personal interest or passion with the support of friends and caring adults and is, in turn, able to link this learning and interest to academic achievement, career success or civic engagement.

Connected learners are fundamentally better than continuous learners. On average, they are 66% more engaged, learn skills 25% faster, are eight times more likely to be high performers, and are more likely to stay with the company that encouraged their connectivity.[11]

In stark contrast to successful firms that build sustainable competitive advantage are the zombie firms that litter our post-pandemic world. We are in danger of being over-run by zombie companies, zombie markets and zombie economies, with the highest share of zombies found in Australia, Canada and the US.[12]

Zombie firms are defined as those that are unprofitable with the low stock market valuation. A just-published working paper based on an international survey of 14 advanced economies by the Bank for International Settlements found the number of zombie firms has significantly increased. Zombie firms are smaller, less productive, more leveraged and invest less in physical and intangible capital. Their performance deteriorates several years before zombification and remains significantly lower than that of non-zombie firms in subsequent years. On average, the number of employees in zombie firms fell by more than 6% per year compared to employment growth of more than 3% in other firms. Zombies are less productive than non-zombie firms. Both their labour productivity and total factor productivity are respectively only half the level of other companies.

While there has been a lot of commentary on the complex financial implications of zombie firms, there seems to be very little focus on the impact of managerial and employee capabilities, competence and performance other than identifying that staff levels and productivity levels have fallen. This raises the need for an increased focus on human capital capability development and creating a learning culture to assist enterprise survival and sustainability and accelerate the potential return from the zombie state to sustainable operational levels and profitability.[13]

We need to develop new business-focused and technology-enabled ways to support workers to deliver business results. This involves exploiting new ways of working, new technologies and machine intelligence. The increasing power of machine learning augmented reality, AI and other new technologies offer an assortment of ways to improve organisational performance and support learning at the speed of business.[14]

11. Australian Institute of Management, 2020
12. Bartholomeusz, 2020
13. Banerjee and Hofmann, 2020
14. Jennings, 2019

Digitalisation is placing unprecedented demands on leaders and will increasingly compel companies to change the way they operate. Leaders cannot be successful unless and until they achieve a certain level of digital savviness. A recent MIT survey of 4,394 global leaders from over 120 countries found that 82% of respondents believe that leaders in the new economy will need to be digitally savvy. In contrast, only 9% strongly agree that their companies have leaders with the necessary skills, and just 12% strongly agree that their leaders have the appropriate mindset for leading in this new world of work. This indicates a measurable disconnect between awareness, ability and urgency.[15]

Companies are moving away from the traditional courses and classes where success is measured mainly by completions and assessments. They are building continuous learning experiences that can be adapted to individual needs while aligning with the business's development needs. This requires the ability to develop agile learning, which is available anytime, anywhere, at the point of need.

Digital learning does not mean organisations should not offer traditional live or virtual classroom learning. It means that other forms of learning must be developed to support it and reinforce it. The 70/20/10 learning framework says that people learn mostly through experiential (the 70) and informal (the 20) learning, so organisations need to create the right blend of experiential, informal and formal education to make the learning effective. The remaining 10% covers structured courses and programmes, and together these three components provide a multidimensional holistic approach to effective workplace learning.

Research shows that most high-performing organisations with year-over-year improvement in KPIs,[16] including employee engagement, customer satisfaction, organisational performance and productivity, use personalised learning as part of their learning strategy. Research suggests that personalised learning supports employees in reaching professional goals more efficiently, helps them continuously develop knowledge, skills and abilities, improves organisational strategy, mission or vision, and aligns with the 70/20/10 framework.

Technology priorities for learning are moving away from course-centric technology to adaptive learning systems that support analytics, collaborative tools, mobile delivery and other tools that can deliver agile, engaging learning experiences for a diverse and tech-savvy workforce.[17] Adaptive learning offers enormous potential for reshaping organisational learning. It recognises that people come to learning situations with different goals, strengths, learning gaps and preferences. It shifts away from the 'one-size-fits-all' approach, using technology and learner data to provide learning experiences tailored for individual users.

Adaptive learning is a practical approach for keeping pace with the rapid speed of change in the workplace. Rather than working through a learning program from start to finish, assessing all content and completing all activities, adaptive learning creates a more effective and efficient learning experience by taking the learner to the content they need, by assessing what they already know and what they still need to learn.

15. Ready, Cohen, Kiron and Pring, 2020
16. Key performance indicators
17. Brandon Hall Group, 2017

Adaptive learning differs from traditional online learning, with success linked to its core characteristics. It is:

- **Personalised** – content and delivery adapt to the learner, depending on their preferences and learning needs, with highly tailored results and individualised eLearning;
- **Bite-sized** – learners access different content in non-linear ways with course content created as standalone chunks and presented to learners in manageable bite-sized servings.
- **Dynamic** – learners make different responses, selections and choices, and the course adapts accordingly, which means that learners have different course experiences.
- **Data-driven** – an individual learner's data determine their pathway through the course content, rather than course developers' hunches about what all learners need.
- **Focused** – instead of visiting all content, learners can concentrate on what they need, while bite-sized content reduces the amount of filler and keeps learners focused on essential information.[18]

The above shows that just as the workplace is changing, so is how we do our jobs, and that the way we learn about our jobs must also change dramatically. Workers now are more connected, feel more bombarded and have less time than ever, yet we have higher expectations for what and how we learn at work. This means organisations are challenged to provide ongoing development that is captivating, continuous, tailored and available on demand. Adaptive learning is a future model for helping organisations develop learning capabilities that support competitive advantage over the long term.

CONCLUSION

Competitive advantage is at the heart of any business strategy. The fundamental basis of above-average performance, in the long run, is a sustainable competitive advantage. Our world business environments are defined by dynamism and change where employees are more mobile than ever; technologies seem to be invented, integrated and then made obsolete in the space of weeks. The current pace of upskilling is struggling to match the rate of change.

A company can outperform its rivals only if it establishes a difference it can preserve. In building learning organisations, there is no ultimate destination or end state, only a lifelong journey. Learning organisations are possible only because deep down, we are all learners.[19]

Before individuals or companies can adequately comprehend the richness of an authentic learning organisation, they must incorporate five critical subsystems: learning, organisation, people, knowledge and technology. Without the interaction of all five subsystems systems, they will only partially appreciate the integrated process and principles necessary. They will forfeit the many benefits to be gained by moving from a state of non-learning to an effective learning organisation.[20]

The second part of this series will present a case study based on a publicly listed company in the finance and banking sector that utilised many of the theories and practices explored above to transition to a learning organisation successfully.

18. Adaptive Learning Demystified, 2019.
19. Senge, 2010
20. Marquardt, 2011

REFERENCES

Adaptive Learning Demystified (2019), *SAP Litmos White Paper*

Australian Institute of Management (2020), Training for the Future

Banerjee, R. and Hofmann, B. (2020), *Corporate Zombies: Anatomy and Life Cycle*, Working Paper, Bank of International Settlements

Bartholomeusz, S. (2020), *The Age*, 4 September 2020, p. 24

Brandon Hall Group (2017), *New Wave of Digital Learning*, Research Report, Brandon Hall Group

Frappaola, C. (2006), *Knowledge Management*, Wiley

Goyder, M. (1993), *Tomorrow's Company: The Role of Business in a Changing World*, Royal Society for the Encouragement of Arts, Manufactures and Commerce Enquiry

Jennings, C. (2019), *The State of Online Learning for Enterprises: How to Support Learning in an Ever-Changing, Technology-Enabled World*, 70:20:10 Institute

Kairinos, N. (2020), *Training Journal*, Dods Parliamentary Communications

Marquardt, M. (2011), *Building the Learning Organization: Achieving Strategic Advantage Through a Commitment to Learning*, Brealey Publishing

Marquardt, M. (2011), *Building the Learning Organization: Mastering the Five Elements for Corporate Learning*, Hodder and Stoughton

Owen, H. (1998), *Riding the Tiger: Doing Business in a Transforming World,* Abbott Publishing

Pickett, L. (1991), *Managing Change: Les Pickett Talks to Harvard Business School's Rosabeth Moss Kanter*, Institute of Training and Development UK

Pickett, L. (1999), *Interview with Michael Porter, Harvard Business School, on Competitive Strategy and Human Resources*, Asian Institute of Management

Ready, D., Cohen, C., Kiron, D. and Pring, B. (2020), The New Leadership Playbook for the Digital Age, *MIT Sloan Management Review*

Senge, P. (2010), *The Fifth Discipline: The Art and Practice of the Learning Organisation*, Random House

Taylor, K. (2020), 'The Broadening Role of L&D', *Training Industry Magazine*

Zuboff, S. (1988). *In the Age of the Smart Machine: The Future of Work and Power*, Basic Books

ESSAY

BUILDING THE LEARNING ORGANISATION: AN AUSTRALIAN CASE STUDY

Les Pickett

In a companion piece to his earlier essay,[1] Les Pickett outlines how a large Australian company transformed itself by developing a culture that put continuous, organisation-wide learning at the centre of its philosophy.

INTRODUCTION

Leaders may think that getting their organisations to learn is only a matter of articulating a clear vision, giving employees the right incentives, and providing lots of training. However, this assumption is not only flawed; it is, in fact, risky, given the challenges of intensifying competition, advances in technology, and shifts in customer preferences. Organisational learning is more important than ever – each company must become a learning organisation.[2]

Workplace learning is a highly critical business strategy that provides the foundation for long-term organisational value creation. It is likely to assume even greater importance in the years ahead. Failing to keep pace with the rate of change within an industry or professional field is expected to lead to business failure over time, and possibly to corporate collapse.

Organisational learning develops competent people who utilise and enhance their collective knowledge and experience to achieve defined outcomes that

1. Learning for Competitive Advantage and Business Success , *BESS*™, vol.3, n.1, 2021
2. Garvin, Edmondson and Gino, 2008

provide business enterprises with their effective strategic advantage – the opportunity to develop a high-performance workforce that can quickly adapt to future change.

Successful organisations of the future will have a clear vision and create a culture and environment that encourages their people to share knowledge and value learning as personal responsibility and a lifelong process.

THE KEY TO FUTURE SUCCESS

A survey of more than 1,200 people conducted by the Chartered Institute of Personnel and Development in February 2020 identified effective practices being carried out by high-performing organisations. These include:

- conceptualising learning as a driver of business value and revenue – moving away from learning as a cost;
- investing in strategic learning to drive the skills needed in future work and using learning as an enabler of agility;
- nurturing a learning culture where learning is valued and supported by leaders – and understanding and facilitating people to help each other to learn constantly;
- personalising learning for individuals, providing learning that is just enough and just for me;
- weaving learning into the flow of work and performance, where people learn as they work and work as they learn;
- tapping into the value of powerful digital learning from apps to advanced simulations, to virtual reality, extended reality and investing in learning platforms;
- being more creative and innovative in learning experiences, in a way that keeps learners coming back.[3]

AN AUSTRALIAN CASE STUDY

I was engaged as a consultant by one of Australia's leading financial services enterprises to help them increase the company's effectiveness by developing practical initiatives to enhance and fully utilise the competencies of people at all levels of the organisation.

The publicly listed, financially sound, diversified company was firmly established, well-regarded and committed to high corporate governance standards, with around one thousand employees and progressive people management practices.

In my role, I participated in executive meetings, was fully involved in numerous planning and strategy discussions, frequently consulted when offsite, maintained regular direct contact with the chief executive and the head of the people and culture function, facilitated the project and carried out an effectiveness review post-launch.

One of my basic philosophies is that external consultants' use should be limited to the essential addition of knowledge and experience not already available within an organisation. Also, the process should facilitate participation in, and ownership of, each project by the people who will make it work.

In presenting this case study of workplace learning in an Australian organisation, I have drawn on an edited version of this project's actual material. In practice, a number of the following activities were carried out concurrently and not always in the sequence presented. This means there may be some minor duplication and several omissions in the material.

I have used the process outlined on several occasions in private, public and not-for-profit organisations in Australia, Asia and Europe. It is straightforward and non-threatening, providing a basis for building an effective learning organisation.

3. Chartered Institute of Personnel and Development, 2020

It uses a survey tool based on the recognition that an effective learning organisation must incorporate the five critical subsystems of learning, organisation, people, knowledge and technology (see Table 1). I used the same tool when assessing a wide range of organisations in the Asia-Pacific region in my role as a member of the International Judging Panel for the World Initiative in Lifelong Learning.

A number of the statements of policy and intent presented here are the result of numerous discussions, which had the beneficial outcome of educating and involving many people, including members of the senior executive team whose understanding and visible support are critical factors in success or failure. These discussions are essential to tailoring the overarching framework to a specific context. Those involved are provided with a sense of ownership. Organisational learning is not imposed on them from outside but developed by and with them.

An understanding of the potential and demands of becoming an effective learning organisation was developed during these meetings. These ranged from one-on-one discussions to larger groups. The maximum group size was kept to under ten people to encourage participation and debate wherever possible. A strong sense of understanding and ownership was developed – this became their project.

TABLE 1: HYPOTHETICAL CORPORATION: SUMMARY OF LEARNING ORGANISATION SURVEY

LOCATION	NUMBER	LEARNING DYNAMICS	ORGANISATIONAL TRANSFORMATION	PEOPLE EMPOWERMENT	KNOWLEDGE MANAGEMENT	TECHNOLOGY APPLICATIONS	GRAND TOTAL
Central	438	12.21	14.49	12.28	11.79	12.55	**63.320**
South	326	11.28	12.11	10.81	10.58	12.28	**57.060**
North	289	10.37	11.26	10.21	9.16	11.89	**52.890**
West	190	10.88	13.11	10.12	9.88	10	**53.990**
Unknown	37	10.94	12.17	9.83	10.06	11.67	**54.670**
Company	[1280]	11.136	12.628	10.650	10.294	11.678	**56.386**
Maximum score		**20**	**20**	**20**	**20**	**20**	**100**

Only Central (which includes head office) scores above the company average in all categories. Apart from South recording a score for Technology Applications and West recording a score for Organisational Transformation above the Hypothetical average, all other scores are below average.

An effective learning organisation should score in excess of 80 points in the Grand Total column

These scores must be treated as indicative. They are not absolute but reflect the perceptions of members of staff of Hypothetical. These can be impacted by a number of factors including managerial level (knowing what is going on), the quality and frequency of managerial communication, levels of delegation and style of managerial leadership in each region.

They provide an effective starting benchmark against which to measure future progress

The company in which the case study took place is among the leading performers in finance and banking and is listed on the Australian stock exchange. It is well-established and highly regarded with an impressive history of growth and profitability. Over recent years, the markets in which the organisation operates have become more competitive. A detailed analysis of several performance indicators highlighted a gradual tapering of growth in both market share and profitability. Underlying these were several other concerning indicators.

Managerial, specialist and staff turnover increased, the duration of employment was shortening, and absenteeism was rising. Despite enhanced technology product and service, processing times were longer, leading to more clients expressing dissatisfaction with waiting times. Client complaints and turnover was increasing, and client retention rates slowly reducing.

There was also a very concerning increase in compliance as the error rate was gradually increasing. There are severe penalties for non-compliance with industry regulation and an accompanying downside of possible negative media exposure.

Rapid changes in technology, accompanied by frequent reporting requirements, highlighted an ongoing need for retraining and skills acquisition. The increase in staff turnover further emphasised the need for more effective basic operational training for new employees. A combination of these factors was also identified as a significant cause of increased pressures on front-line and mid-level managers.

Following several informal discussions, an important decision was made at an executive level to address these issues to protect the business's future profitability and sustainability by transforming to a more profitable, sustainable, objective-oriented learning organisation.

The case study organisation's senior management team was intensely focused on the company's success, the provision of high-quality client service and the creation of shareholder value. They agreed that the company needed to continue to grow and diversify in a very complex and highly competitive market and recognised that it was their people who make the difference.

They were committed to the need to continue to develop and maintain a high-performance workforce to ensure that they remained highly competitive in the future and that this required the identification and development of the critical capabilities needed for success.

To achieve that goal, the *first step* was to define a high-level objective for the initiative as follows:

> **To increase the company's effectiveness by delivering high-quality, professional services by developing and introducing practical initiatives that will enhance and fully utilise the competencies of people at all levels of the organisation.**

The introduction of an effective learning initiative provides an opportunity to strengthen the existing focus on client service. Also, to create an environment in which individual skills and capabilities are utilised, staff motivation is increased, and a higher level of performance is achieved. It can also position the company to respond rapidly and positively to future changes and challenges.

To ensure consistency about the learning process, the following objectives were agreed:

- That the introduction and application of changing technology to our work will continue and we will be expected to operate in different ways, using different tools and processes.
- The identification, adaptation and introduction of new technology will require the acquisition of new competencies. This means that our people will be challenged to develop new knowledge and skills.

- We recognise learning as a lifelong process that impacts all we do both at work and in our private lives. We need to facilitate and develop a framework that will support learning as a continuing process.

Before launching the initiative, it was essential to define the commitment involved. This entailed ensuring a clear understanding of, and strong support for, the organisational learning project on the part of senior management. The executive team agreed the following guidelines:

- We are committed to delivering competitive advantage through our people and will do this by creating and the environment in which our employees are successful, developed and well rewarded.
- We recognise learning as a continuous, strategically focused process that will be reflected in our company's overall achievement and future success.
- We recognise that organisation-wide learning is essential if we are to maintain our leadership role in our various specialisation fields and create an environment that encourages ongoing learning and creativity.
- We will develop and enhance the knowledge and skills required to enable our people to perform their current roles effectively and competently and prepare them for new and changing roles.
- We will identify and develop suitable people for increased future responsibilities, where appropriate.

Following further consultation and discussion, we identified the importance of conceptualising learning as a continuous process and agreed on the following:

- Learning is a lifelong process and impacts on all we do both at work and in our private lives.
- The introduction and application of changing technology to our work will continue, and we will be expected to operate in different ways, using different tools and processes.
- The identification, adaptation and introduction of new technology will require the acquisition of new competencies. This means that our people will be challenged to develop new knowledge and skills.
- We recognise the need to facilitate and support learning as a continuing process. We will develop a framework that will assist in providing a practical and timely focus on this development.

To put our plans into action, we established several critical project guidelines:

- minimal divergence of managers from their key responsibilities;
- managerial ownership and staff support for the program;
- progressive consultation and review to ensure project integrity;
- integration of activities and processes with existing HR programs;
- minimal paperwork and documentation;
- minimal use of external consulting support;
- strong focus on improving client service provision.

To make the plan work, a primary three-stage program was implemented. In **Stage 1**, current practices were reviewed, and the organisational learning profile was established to ensure consistency and currency. This was communicated to management via executive briefings. A draft action plan was created, following several informal discussions with the key players, which was then reviewed by the senior executive team.

In more detail, the key action points in this Stage were to *Conduct an Initial Briefing* – that is, a

presentation on the linkages between learning, competencies, effectiveness and performance incorporating the requirements of becoming a learning organisation together with the benefits this can bring to both the enterprise and members of staff. Also, we undertook a *Review of Current and Projected Activities*, which entailed conducting a preliminary review of current activities and planned future initiatives relating to human resource management, staff training and management development programs. This was an essential precursor to *Establishing the Learning Organisation Profile*, which aims to reflect the current perceptions of staff members and provide a basis for the future evaluation of progress towards becoming an effective learning organisation. The instrument used to establish the Learning Organisation Profile is in the Appendix.

Once these steps were undertaken, it was possible to *Conduct an Executive Briefing*, that outlined the specific actions required to build an effective learning organisation within the context of the company's mission, values, principles of good conduct and strategies. This step included a participative component to identify issues and potential problem areas. Based on these, it was possible to *Develop an Integrated Program Structure*, an action-focused strategy document recommending the specific steps to be taken.

An important component was the recognition that changes may be required as we drilled into the project. A progressive staged initiative was agreed as follows:

1. Prepare an integrated strategy for the development of a learning culture within the company;
2. Conduct an executive briefing on the linkage between learning and performance and the requirements of becoming a learning organisation;
3. Review current human resource programs, processes and planned future initiatives, including performance appraisal and the identification of managerial and specialist capabilities.
4. Review training and development programs and activities including any projects currently being undertaken;
5. Establish a learning organisation profile which incorporates the perceptions of our staff;
6. Develop an integrated program and action plan;
7. Design a model of the practical learning organisation initiative to facilitate understanding and provide defined action guidelines;

In **Stage 2**, we worked together with staff to *Develop a Model*. A model of the process required to become a learning organisation was developed in an easily understood format. The model provides both a basis for the implementation of the current project and the subsequent evaluation stage. The development of a plan of action and a strategy for implementation relied on continuous learning based on management and staff feedback. This was part of the agreed-upon progressive staged initiative as follows:

8. Implement the agreed strategy;

In **Stage 3**, the program was reviewed to establish if objectives set during Stage 1 were achieved.

9. Evaluate the effectiveness of the program.

A key action point from the guidelines established in **Stages 1** and **2** that took place in **Stage 3** is the *Review of Program Effectiveness*, a series of formal reviews to be carried out on a progressive basis to ensure that the desired project outcomes become embedded in the day-to-day operations of the company.

To lay a foundation for the organisation's future and clarify the requirements of a supportive

environment, we prepared and agreed on the following to guide all nine steps outlined above:

- We understand the importance of a working environment, which recognises the critical links between effective learning and business success.
- In our competitive environment, we need to develop an integrated team of people capable of maintaining and further enhancing a high level of performance and client service and rapidly adapting to changing circumstances.
- We have defined and communicated our mission, values and principles of good conduct to provide a set of professional guidelines and expect that all of our people will respect and apply these.
- Our objective setting and strategic planning processes provide us with specific targets and future direction.
- We have reconfigured our organisation to streamline our structure, improve communication and collaboration, clarify accountabilities and enhance decision making.
- We will introduce and utilise appropriate technology to improve business efficiency, enhance the sharing of knowledge, and facilitate communication and learning.
- We are committed to becoming an organisation which values learning and recognises learning as a lifelong process.
- We actively encourage our people to enhance their current knowledge and skills, participate in team activities, assist their colleagues in acquiring relevant workplace knowledge, and accept prime responsibility for their learning.
- Our company learning and development programs form an integral part of our business plans and reflect our strategic directions and critical objectives.
- Our performance review, staff training, management development, succession, and career planning programs are all designed to contribute to our business's future success by developing our people.
- The primary objectives of our company-wide training and development program are to:
  - improve the performance of our people in their current role;
  - develop our people per their capabilities and aspirations.
- We believe that the quality of each person's work will improve with effective two-way communication and competent guidance from their manager.
- While the final responsibility for learning and development rests with each individual, a recognised and organised procedure is the most effective way to ensure that this occurs.
- People need to know and understand what is expected of them. They need to know what to do and how to do it. They need time frames and priorities.
- Clear objectives will be established for each business unit, section, manager, supervisor and for other specialist and administrative roles where appropriate.
- We will conduct a performance review program based on agreed objectives.
- A company-wide training and development program will be prepared based on input from the strategic business plan and performance reviews. Individual training and career development plans will be designed where appropriate.
- There will be an ongoing dialogue with effective two-way communication and realistic feedback between each manager and their work team.

An essential step in any project is identifying project outcomes that should be achieved and measuring whether these outcomes have taken place. On review of the project's aims and whether they have been completed, we successfully met the following project outcomes as a result of the above steps and guidelines. It is important to note that many inter-related factors impact company performance, and it

can be challenging to identify specific contributors. In reviewing this project, there was a combination of indicative evidence and hard data showing that the learning organisation initiative positively contributed.

Over 18 months, market share and profitability increased, productivity improved, absenteeism and staff turnover reduced, people stayed longer, the calibre of applicants for employment improved, compliance error rates and customer complaints reduced, and client retention rates improved.

As a result of the enhanced learning and development activities, there was tangible evidence that managers were better equipped and more comfortable carrying out their roles in an increasingly challenging environment.

CONCLUSION

There are many benefits to be gained by developing an ongoing organisational learning culture. Essential success factors include the support and involvement of the senior executive team, making sure managers can put the policies and statements of intent into practice in the workplace, and that individual employees accept their responsibility for training and self-development.

The interaction of the five critical elements of learning dynamics, organisational transformation, people empowerment, knowledge management and technology applications are essential components of a learning organisation initiative. This article has outlined how these elements can be put into practice via a structured approach that relies on management and staff involvement.

While there is considerable literature about creating a learning organisation, there seems to be little research into the longer-term impact and effectiveness of the original initiative. It would be interesting to see some comprehensive reviews carried out three to five years down the track.

REFERENCES

Chartered Institute of Personnel and Development (2020), Learning and Skills at Work 2020 Mind the Gap: Time for Learning in the UK, https://www.cipd.co.uk/Images/learning-skills-work-report-1_tcm18-79434.pdf

Garvin, D., Edmondson, A. and Gino, F. (2008), 'Is Yours a Learning Organisation?', *Harvard Business Review*

Pickett, L. (2021), Building the learning organisation: an Australian case study, *BESS™*, vol. 3, no. 1, 2021

APPENDIX

CONSULTING LEARNING ORGANISATION PROFILE

Please read the following list and rate each item according to the following scale:

4 = applied fully **2** = applies to a moderate extent **3** = applies to a great extent **1** = applies to little or not extent

1. LEARNING DYNAMICS: Individual, Group or Team, and Organisation	RATING
1.1 We are encouraged and expected to manage our own learning and development	
1.2 People avoid distorting information and blocking communication channels, using such skills as active listening and effective feedback	
1.3 Individual are trained and coached in learning how to learn	
1.4 Teams and individuals use the action learning process. (That is, on problems or situations and then apply their new knowledge to future actions.)	
1.5 People are able to think and act with a comprehensive, systems approach	
2. ORGANISATION TRANSFORMATION: Vision, Culture, Strategy, and Structure	RATING
2.1 Top-level managers support the vision of a learning organisation	
2.2 There is a climate that supports and recognises the importance of learning	
2.3 We learn from failures as well as successes	
2.4 Learning opportunities are incorporated into operations and programs	
2.5 The organisation is streamlined – with few management levels – to maximise Communication and learning across all levels	
3. PEOPLE EMPOWERMENT: Employee, Manager, Customer, and Community	RATING
3.1 We strive to develop an empowered workforce able to learn and perform	
3.2 Authority is decentralised and delegated	
3.3 Managers take on the roles of coaching, mentoring, and facilitating learning	
3.4 We actively share information with our customers to obtain their ideas to learn and improve services and products	
3.5 We participate in joint learning events with suppliers, community groups, professional associates, and academic institutions	

Continued overleaf >

4. KNOWLEDGE MANAGEMENT: Acquisition, Creation, Storage and Retrieval, and Transfer and Use	RATING	
4.1 People monitor trends outside our organisation by looking at what other do – i.e., by benchmarking best practices, attending conferences, and examining published research		
4.2 People are trained in the skills of creative thinking and experimentation		
4.3 We often create demonstration projects to test new ways of developing a product or delivering a service		
4.4 Systems and structures exist to ensure that important knowledge is coded,stored, and made available to those who need and can use it		
4.5 We continue to develop new strategies and mechanisms throughout the organisation		
5. TECHNOLOGY APPLICATIONS: Information Systems, Technology-Based Learning, and EPSS (Electronic Performance Support Systems)	RATING	
5.1 Effective and efficient computer-based information systems help our organisational learning		
5.2 People have ready access to the information superhighway – for example, through local area networks, the Internet, and so on		
5.3 Learning facilities such as training and conference rooms incorporate electronic multimedia support		
5.4 We support just-in-time learning with a system that integrate high-technology learning systems, coaching, and actual work into a single, seamless process		
5.5 Electronic performance support systems (electronic tools that use multimedia knowledge bases to capture, store and distribute information throughout the organisation)		
	TOTAL	

ESSAY

COVID-19 HOTEL QUARANTINE INQUIRY, VICTORIA, AUSTRALIA

Walter de Ruyter

In his first essay for our Journal, Walter de Ruyter explains how antifragility can inform a framework for better management of 'black swan' events,[1] and explores the influence of groupthink in Victoria's initial handling of the COVID-19 crisis.

INTRODUCTION

Australia initiated a nationwide response through its States and Territories to contain and mitigate the impact of COVID-19 on the Australian population. From a global perspective, Australia has been a leader in managing the COVID-19 pandemic.[2] However, the different approaches taken by States and Territories mean that some states have experienced the impacts of the pandemic differently. The State of Victoria faced more significant challenges in its containment strategies, with cumulative data as of 15 March 2021[3] showing that 90.2% (820 out of 909) of all COVID-related deaths across Australia occurred in Victoria. Victoria's management of hotel quarantine was a key containment strategy. Particularly heartbreaking for Australians is that many of the COVID-related deaths in Victoria were predominantly in private

1. A black swan is an unpredictable event that is beyond what is normally expected of a situation and has potentially severe consequences. Black swan events are characterized by their extreme rarity, severe impact, and the widespread insistence they were obvious in hindsight. – Investopedia
2. Our World in Data, 2021
3. Department of Health, 2021

or not-for-profit aged care facilities.[4] In response to the issues arising from hotel quarantine, the Victorian Government established a COVID-19 Hotel Quarantine Inquiry, with its final report released in December 2020.[5]

From an international perspective, the overall morbidity and mortality numbers are small in Australia. What is unique from a nation and state perspectives is the significant morbidity and mortality between Victoria and other Australian States and Territories. The Inquiry report allows for assessing contributing factors to inform future practice both within Australia and elsewhere. The following is a short commentary of the Victorian Government's report on hotel quarantine used as a critical containment strategy for COVID-19. It adopts an antifragility perspective to examine how the Victorian Government's approach became subject to groupthink before demonstrating how organisational practice can overcome fragility to build resilience.

CASE STUDY

Much has been written about the breakdowns of the Victorian Government's adoption of a hotel quarantine system for repatriating Australians during the COVID-19 pandemic. There is no denying that the task confronting the State Government, to develop from scratch a state-wide hotel quarantine system, was enormous: 'The lack of a plan for mandatory mass quarantining meant that the Hotel Quarantine Program was conceived and implemented 'from scratch' to be operational within 36 hours from concept to operation'.[6]

The illustrative case study outlined here serves to connect the events of the hotel quarantine review. It gives examples of what did not work well in implementing hotel quarantine in Victoria, applying the lens of antifragility and groupthink. **Antifragility** is a process in which stressors are information used to manage the risk arising from rapid change effectively. Nassim Nicholas Taleb presented the concept in his 2012 book *Antifragile: Things That Gain From Disorder.*[7] As highlighted by Irving Janis,[8] **groupthink** arises where the desire for consensus amongst critical stakeholders overrides their ability to evaluate alternatives objectively.[9] Groupthink requires individuals to avoid raising controversial issues or alternative solutions, and there is a loss of individual creativity, uniqueness and independent thinking. That groupthink may have prevailed in the development of Victoria's hotel quarantine system emerges from one of the Inquiry's findings: 'While there was a range of plans in place ... none of those plans contemplated the mandatory mass quarantine of people in response to a Class 2 emergency.'

Further, we consider establishing an approach to capture tribal knowledge in conjunction with a buyer-seller model to address groupthink and support organisations in becoming antifragile. **Tribal knowledge** is any unwritten information that is not commonly known by others within a company. This term used most when referencing information that may need to be known by others to produce quality products or services.[10] A buyer-seller model complements a closer move to insights made by frontline staff informing strategy. The objective is to convert insights from the client-provider relationship into commercial reality, allowing the organisation to respond earlier to an environment of rapid change.

4. Handly, 2020; Davey, 2020
5. Coate, 2020, p.96
6. Ibid.
7. Taleb, 2012
8. Janis, 1982
9. Turner and Pratkanis, 1998
10. Isixsigma.com, retrieved 7 May 2013

BACKGROUND

Danco[11] described the relationship between fragile, robust and Antifragile in organisations as depicted in the following table:

TABLE 1

STATUS OF ORGANISATION	STRESSORS IMPACTING THE ORGANISATION
Fragile	The impact of stress creates uncertainty
Robust	Impact of stress is Indifferent
Antifragility	Impact of stressors resolve uncertainty (stressors are information to be acted upon)

Adapted from Danko, 2020a

According to Taleb,[12] antifragility is based on the idea that 'Everything gains or loses from volatility. Fragility is what loses from volatility and uncertainty'. Whilst antifragility gains from volatility and uncertainty, in antifragile systems, stressors are information.[13] In a 'black swan event' such as COVID-19, conventions (the way something is usually done) around practice struggle to effectively respond to the event's scale, as they govern a specific set of organisational parameters to operate. To respond in scale requires re-imagining those parameters, which may mean establishing seamless communication across response agencies. The Australian Government learned this lesson in establishing a national cabinet on 13 March 2020.[14] Similarly, at a state level, the NSW Government established a whole-of-government response to black swan events in its creation of a government agency called Resilience NSW on 6 April 2020.

More recently, with the release of the new Federal Budget on 11 May 2021, the Australian Government announced the establishment of the National Recovery and Resilience Agency, with a budget of $600 million to support local communities during the relief and recovery phases following major disasters.[15]

An often overlooked aspect of groupthink is the conventions reflected in practice habits. Both formal and informal conventions act as filters. The outcome is that stressors on established practice have to be relatively large before the organisation reacts, resulting in a lag effect. If the event is significant in scale, such as a black swan, the impact of a lag effect increases uncertainty. Viewed in the context of COVID-19, a lag effect in responding compounds scale such as infection rates. Concerning Victorian hotel quarantine, the following quote from the Inquiry reveals that conventions created this lag effect in dealing with the COVID-19 crisis:

> **'... Just as the [Victorian] Department of Health and Human Services did not see itself as the control agency responsible for the Program, it did not see itself as "in charge" on-site. This left brewing the disaster that tragically came to be. This complex and high-risk environment was left without the control agency taking its leadership role, which included the need to provide on-site supervision and management. This should have been seen as essential to an inherently dangerous environment. That such a situation developed and was not apparent as a danger until after the two outbreaks, tragically illustrated the lack of proper leadership and oversight, and the perils this created.'**[16]

11. Danco, 2020a
12. Taleb, 2012
13. Danco, 2020b
14. Australia's National Cabinet was established on 13 March 2020 to address and ensure consistency in Australia's response to the COVID-19 pandemic.
15. Australian Library and Information Association, 2021
16. Coate, 2020, p.26

The Victorian Government response was challenging as, like many plans where communication is promoted as open and working in unison, it was, in reality, centric and siloed. As an analogy, many organisations are currently structured like a box of round pencils. Each pencil contacts the other across four points with a lot of separation space. That separation space is where strategic emergency plans sit and only realise their potential when pressure-tested by the event's reality. For example:

> 'Both the State and Commonwealth governments were aware, prior to 2020, of the possibility of a pandemic and its potentially devastating consequences. However, none of the existing Commonwealth or State pandemic plans contained plans for mandatory, mass quarantine. Indeed, the concept of hotel quarantine was considered problematic and, thus, no plans for mandatory quarantine existed in the Commonwealth's overarching plans for dealing with pandemic influenza.'[17]

Another area for consideration is optionality:

> '... which is a precondition to Antifragility, but just because you have options doesn't mean you're Antifragile. A fragile organisation, facing an unknown stressor, may have plenty of "options" available to them. But if you don't know what to do with those options, and if you don't know how to grow into the challenge, then those options don't do you any good.'[18]

The impact of several options being overseen by a disjointed governance structure and practice not designed for scale such as a black swan event resulted in a situation where:

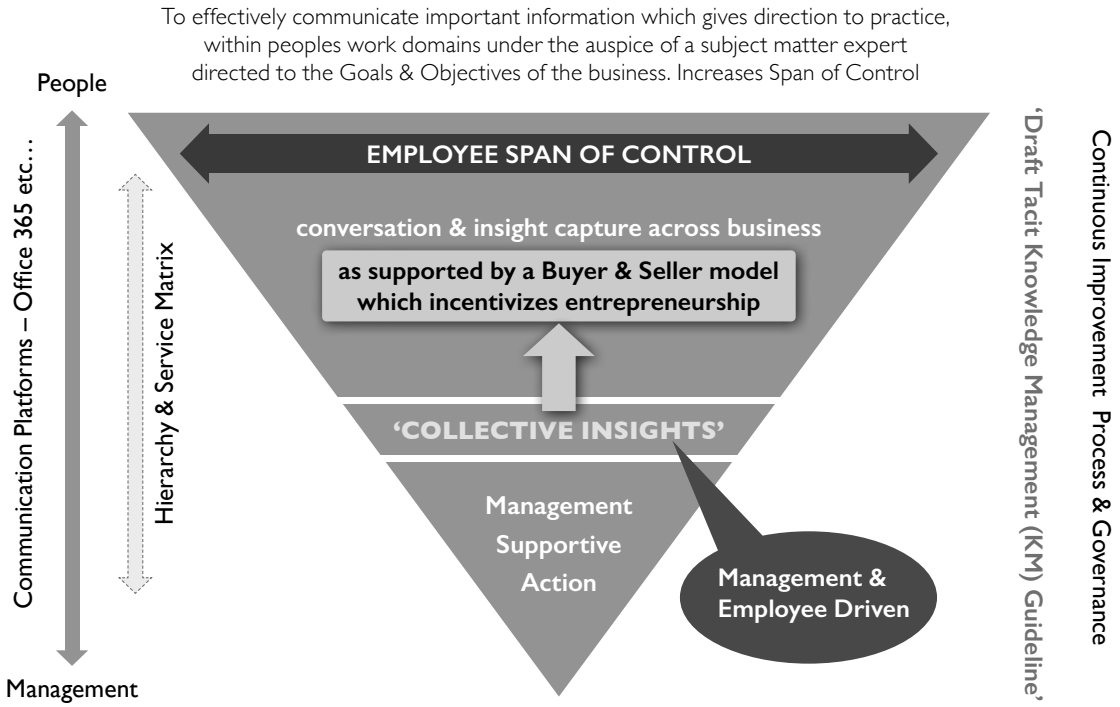
> '... Inside the DHHS internal governance structures, there was not an agreed view or consistent understanding between emergency management executives and the public health senior members as to who was fulfilling what functions and roles, and who was reporting to whom. In the context of the operation of the Hotel Quarantine Program, this created confusion and fragmentation in governance structures and, apparently, tension and frustration.'[19]

The inverse pyramid depicted in Figure 1 links to Fayol's Bridge.[20] Henri Fayol proposed that subordinate employees should be allowed to communicate directly with each other, given that their superiors had agreed upon this procedure. This principle became known under Fayol's Bridge, which conceptualises decision making in a stream matrix model where decisions are made as close as possible to the client-provider interface with appropriate delegations for decision-making.

The model of Fayol's Bridge is evident in the structure of Resilience NSW, where subordinate decentralised agencies communicate directly with each other, fast-tracking intelligence upward to government decision-makers. A key success factor in how the NSW Government has successfully managed COVID-19. Compared to Victoria, Resilience NSW derived increased efficiency through rapid and informed decision making from a more decentralised government in New South Wales.

17. Coate, 2020, p. 12
18. Danco, 2020a
19. Coate, 2020, p.26
20. Wikipedia, retrieved on 29 May 2021, https://de.zxc.wiki/wiki/Fayolsche_Br%C3%BCcke

FIGURE 1: CAPTURING TRIBAL KNOWLEDGE TO SUPPORT ANTIFRAGILITY STRATEGIES



Siloed organisations tend to filter out small and manageable stressors. However, these are likely to accumulate and become significant problems in black swan events.

According to Danco, 'The only way you can feasibly do this is for disorder detection and response to take place at a small enough resolution, and tight enough turnaround time'. Such a response is granular dynamic, and low cost. Response at a macro level often is, 'Top-down systems have a hard time with antifragility because for them, all options are costly'.[21]

Danco's description is reflective of the Victorian Government's centralised structure:

> 'Accordingly, Antifragile systems and organisms lean towards a common theme: bottoms-up decision-making, rather than top-down decision making. Antifragility requires real options, and real options are low-cost. Antifragility is only successful if you can actually detect, react, and grow in response to deviations from your present state in real time.'[22]

21. Danco, 2020a
22. Ibid.
23. Danco, 2020a

The analogy of the immune system and the role of antifragility is depicted in table 2.

TABLE 2

Barriers (e.g., Skin)	It's just a dumb wall (but it works most of the time)	**Fragile**	**Barriers** are akin to 'conventions', prevalent in business which act as a guide when responding to known and everyday issues.
Innate Immunity	Good at catching threats, but must know about them in advance	**Robust**	**Innate immunity** is evident in strategic plans and the quality systems of the organisation. Their designed response is reactive to a perceived horizon or an immediate issue.
Adaptive Immunity	Stressors are information; exposure creates the response	**Antifragile**	**Adaptive immunity** is incorporating a dynamic process to capture insights from tribal knowledge which complement quality systems. Its design is to respond to the unplanned effectively.

Adapted from Danco.[23] The fourth column links governance and knowledge management to adaptive immunity.

The analogy of 'adaptive immunity' as depicted in table 2 demonstrates variation in practice where the organisation's health and resilience can be conceptualised in terms of our body's immune system.[24] In essence, how unplanned disorder is managed determines how organisations survive and prosper.

Adaptive immunity practices can be proposed as a stepping stone for organisations to become antifragile and combat the negative impact of groupthink. The capture of tribal knowledge moves information derived from issues (often unplanned and unknown) to understanding and its application to better manage volatility by converting risk to opportunity. The process around tribal knowledge capture becomes embedded and in constant motion within the organisation's governance structure. Tribal knowledge is an integral part of adaptive immunity, which sits between business continuity and resilience strategies for organisations. Effectively capturing tribal knowledge is a critical whilst often overlooked step in building resilience strategies within organisations. The recently released Microsoft Viva application[25] is a step in this direction, although it still requires linkage points to hierarchy structures that continue to dominate corporate management.

24. Ibid.
25. https://www.theceomagazine.com/business/innovation-technology/microsoft/

CONCLUSION

There has been much discussion in academic journals and the media about building resilience in organisational structures in response to changing markets where business models become unstable due to unforeseen circumstances, such as COVID-19. This paper uses the recent Victorian Inquiry into Hotel Quarantine to consider how antifragility may be a means to better manage unforeseen circumstances. It extends this to the analogy of adaptive immunity, a descriptor that is becoming more mainstream as a way of responding to unplanned change. Organisations are finding the analogy of adaptive immunity as an effective means of communicating the next step in becoming antifragile whilst overcoming the often unrecognised negative impact of groupthink.

REFERENCES

Australian Library and Information Association (2021), Federal Government Budget 2021-22, 11 May 2021, https://www.alia.org.au/news/22106/federal-government-budget-2021-2022#:~:text=A%20new%20body%2C%20the%20National,recovery%20phases%20following%20major%20disasters.

Coate, J. (2020), COVID-19 Hotel Quarantine Inquiry, Final Report and Recommendations, Volume I, Parl paper no. 191 (2018–2020), https://www.parliament.vic.gov.au/file_uploads/0387_RC_Covid-19_Final_Report_Volume_1_v21_Digital_77QpLQH8.pdf

Danco, A. (2020a), *Antifragility*, Welcome to Dancoland, 12 March 2020, https://alexdanco.com/2020/03/12/antifragility/

Danco, A. (2020b), *Antifragility, Two Truths and a Take, Season 2 Episode 8*, 16 March 2020, https://danco.substack.com/p/antifragility

Davey, M. (2020), Privately operated aged care homes behind devastating COVID-19 infection rate in Victorian health workers, *The Guardian*, 27 August 2020, https://www.theguardian.com/australia-news/2020/aug/27/nurses-union-says-lack-of-surge-workforce-plans-behind-devastating-covid-19-infection-rate

Department of Health (2021), Coronovirus (COVID-19) current situation and case numbers, active cases and deaths by state and territory, January 2021, https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/coronavirus-covid-19-current-situation-and-case-numbers#cases-active-cases-and-deaths-by-state-and-territory

Handly, E. (2020), Why are there more COVID-19 cases in private aged care than the public sector?, *ABC News,* 1 August 2020, https://www.abc.net.au/news/2020-08-01/why-more-covid-19-cases-in-private-aged-care-than-public-sector/12503212

Janis, I. (1982), *Groupthink*, Cengage, Boston

Our World in Data (2021), Australia: Cumulative confirmed cases: how do they compare to other countries?, Oxford Martin School University of Oxford, https://ourworldindata.org/coronavirus/country/australia#cumulative-confirmed-cases-how-do-they-compare-to-other-countries

Taleb, N.N. (2012), *Antifragile: Things That Gain From Disorder*, Random House, New York

Turner, M.E. and Pratkanis, A.R. (1998), 'Twenty-Five Years of Groupthink Theory and Research: Lessons from the Evaluation of a Theory', *Organizational Behavior and Human Decision Processes*, Vol.73, Nos.2/3, pp. 105–115

ESSAY

‘WE MUST KEEP LEARNING AND WE MUST KEEP DOING’: SPEECH TO 2021 UN CLIMATE ADAPTATION SUMMIT

Prof Brian Schmidt AC

The Australian National University Vice-Chancellor and winner of the 2011 Nobel Prize in Physics Prof Brian Schmidt AC outlines how using science with urgency, at scale and in collaboration will help prevent catastrophic climate change.

It’s a great honour to be asked to speak on behalf of the people of Australia and the global scientific community at this important summit.

As per our traditions here in Australia, I celebrate and pay my respects to the Ngunnawal and Ngambri people of the Canberra region whose cultures are among the oldest continuing cultures in human history – going back a mere 20000 years or so here.

I know that to many, the task we are discussing here today – heading off cataclysmic climate change – appears so huge and so difficult that it sometimes seems futile.

Such people say that our world is so vast and so timeless that any claim that we can influence it for good or ill, is conceited. An act of hubris.

It’s this attitude we must combat.

Because by employing science, with the necessary scale, urgency and collaboration, we can and will succeed.

We need to keep learning and we need to keep doing.

The starting point is adopting a different perspective: the perspective of science.

As it's my area of expertise, let me give you the perspective of astronomy.

Why Astronomy? Because when you grasp the true scale of the ever-expanding universe, you realise just how wrong the doubters are when they say the world is too big and too timeless for us to alter its behaviour.

I want you to recall a famous image of our earth - the tiny pale blue dot taken by the Voyager spacecraft as it sped out of our solar system in 1990.

Turning the Voyager camera back towards Earth was a masterstroke - because that image showed like nothing else that our world is smaller and more fragile than we think.

And it has never looked more fragile than right now.

The comfortable, prosperous life we live in the narrow gap between the bottom of its oceans and top of its atmosphere, has never been more at risk.

The danger to the Earth is real and the need to address it is urgent.

...

We are of course becoming more and more accustomed to big and urgent problems.

Our worries this year have been about a disease, but the people of the world may recall that this time last year the east coast of Australia was on fire, its air barely breathable, and its people having to be evacuated from the flames by the Royal Australian Navy.

What happened in my country last year is what the whole world may one day have to face.

In just the last twelve months, my own university has had to cope with extreme bushfire and hail events, in addition to the pandemic.

As someone once said, nothing focuses the mind like the prospect of facing a firing squad. We are focused on climate change like never before.

As a member of the world's scientific community, I'm here to tell you that science, as always, stands ready to serve the people of the world.

Renewing our trust in science and other forms of knowledge is vital.

In recent times, that trust has been undermined.

'Science', 'expertise', 'evidence'... The purveyors of doubt have tried to devalue these powerful weapons in the fight against climate change.

We can't let them succeed.

Things, though, are starting to swing back.

Medical science has brilliantly come to the rescue in the gravest crisis the people of the world have faced for generations.

By tackling COVID-19, science undertaken with urgency, scale and international cooperation has proven its value to humanity.

The goodwill that science has generated must now be harnessed to this next big battle.

What must we do?

Put most simply, we need to keep learning, and we need to keep doing. We need to trust in science and engage all our resources, including our universities.

On becoming a Nobel Laureate, my father said to me: 'You've got a Nobel Prize, you can do anything you want, so why on earth would you take on one of the hardest jobs in the world and run a university?'

My answer was that universities and other places of knowledge and science have a crucial role to play in solving humanity's biggest problems.

Tackling climate change is the clearest and most urgent example.

The things universities teach and research – science, engineering, economics, public policy and others — are providing the answers. We just need to implement them faster, at greater scale and with genuine global cooperation.

With the world on a trajectory to exceed a 1.5 degrees Celsius increase above pre-Industrial levels between 2027 and 2042, there must be no delay.

No half measures. No jurisdictions working against each other.

For Australia – which is such a large per capita contributor to global emissions and which has such abundance of natural renewable resources – the answer lies in scaling up clean energy generation ASAP. This is an urgent moral obligation which Australia must not shirk.

My own university is playing its part. The Australian National University has adopted what we call the ANU Below Zero initiative - a plan to make the university carbon net negative by reducing our own emissions and by using our research assets to help the world pull carbon down from the atmosphere.

Earlier this week, I spoke to 500 future leaders in science about the challenges of addressing climate change at the National Youth Science Forum.

I challenged them to come up with the best idea for using Covid-19 stimulus spending to boost climate adaptation. I intend to share the top five ideas with our Prime Minister because he needs to hear from the people who are going to inherit our planet.

I'll share one idea with you now.

Each year, the methane burps of beef and buffalo produce two Gigatonnes equivalent of Co2. Young science students, Phoebe and Wen have suggested a great investment is to use an Australian discovery. That by adding a small amount of seaweed – Asparagopis taxiformis – to the feed of bovine reduces their methane emissions by about 90 per cent, with a corresponding increase in livestock productivity.

Investing in the research and capital for farming the seaweed at scale around the tropics (which has the potential to improve water quality), provides an alternate sustainable source of jobs and incoming for developing countries whilst increasing livestock production and dramatically cutting greenhouse gas emission. A great idea - and just one that our global leaders need to consider.

This is learning and doing in action. This is the way forward.

…

As an astronomer, I want to leave you with one additional thought.

Our little world… our home… will survive global warming.

Take it from me, the universe is littered with billions of uninhabitable planets.

We humans will most likely survive too.

But unless we head off catastrophic global warming, our lives on this planet will be more difficult, more dangerous and less pleasant.

We have all seen the tragedies COVID-19 has caused and witnessed the pressures it has placed on our societies and our political systems.

This will be nothing compared to the stress that is likely to follow uncontrolled global warming, with its floods, fires, droughts, famines, unbearable heatwaves and other human calamities.

As in the pandemic, science employed with the necessary scale, urgency and global collaboration is the only answer.

Keeping on learning and acting is the only answer.

The scientific world stands ready to act. Our universities stand ready to act. Let's get started.

Note from the Editor: On 20 May 2021, ANU became the first university in Australia to act on climate change. As part of its Below Zero Initiative, it has pledged to become carbon neutral by 2025 and achieve below zero emissions by 2030.

ESSAY

‘THE TIME FOR RESILIENCE IS NOW’:[1] RECOMMENDATIONS OF THE 2020 GAP SUMMIT ON NATIONAL RESILIENCE

Olga Bodrova

Recent environmental, health and economic crises have exposed Australia’s structural weaknesses as well as highlighting individual strength and community agility in the face of challenge and change. Olga Bodrova recounts the ideas and proposals from Global Access Partners’ latest public forum in 2020.

A RESILIENT NATION

> ‘The bumps in the road aren’t in the way, they are the way.’ – GAP Summit delegate

Over the last 20,000 years, humans have proved themselves to be the most resilient and adaptable inhabitants of Planet Earth. Since the end of the last Ice Age, we have explored and occupied every habitat, from the polar ice and equatorial rain forests to the open ocean and outer space. While other animals are limited by the relatively slow process of evolution by natural selection, we humans rapidly adapt to new circumstances through individual experimentation, reshaping group cultures and inventing power-magnifying technologies which transform the environment to suit our needs.

Humanity has weathered any number of cataclysmic events, both natural and manmade, from volcanos and earthquakes to plagues, famines, world wars and the threat of nuclear destruction. The historical

1. Fitzsimmons, 2020

impact of coronavirus is still to be seen, but GAP's Resilience Summit in September 2020[2] – held online for the first time due to the COVID-19 pandemic – summarised the quick lessons learned and suggested positive steps to ensure Australia is better placed to weather such crises in the future.

Australia had next to no stockpiles, plans or contingencies in place before the pandemic hit and escaped the ravages of coronavirus due to its 'girt by sea' geography as much as proactive policy. The economic and cultural effects of containment measures were more significant than its domestic health effects, but just as vaccines are inoculating us against COVID-19, so this experience can be used to prepare the country for an ever more uncertain and contested future.

While Australia, unlike the USA, the UK, Europe, Brazil and India, suffered relatively few cases and deaths, the nation was still recovering from severe bushfires when the borders were closed, and recent floods have also highlighted the exposure of modern civilisation to the wrath of nature. The fracturing of international 'just in time' supply chains rocked the foundations of 30 years of economic globalisation, outsourcing and cost-cutting, while the 'panic buying' of the pandemic's early days exposed the fragile nature of our society when basic staples are in short supply.

As an island nation at the end of long trade routes, Australia is particularly vulnerable to global trade disruptions, whatever their cause may be. Low-cost, just-in-time international supply chains rely on every aspect working perfectly, and COVID-19 both exposed their low tolerance for loss and disruption and the speed with which domestic and international cohesion can fracture when stressed.

Similarly, Australian health care has increasingly focused on the chronic diseases suffered by its aging population and was unprepared for the sudden resurgence of infectious disease. The nation had just 2,000 intensive care beds when COVID-19 struck, a quarter less than the OECD[3] average for a nation its size. Australia imported 90% of its medicine and nearly all its Personal Protective Equipment while maintaining no mandated minimum stock levels of essential items.

Policymakers had assumed that the market would provide for every need and circumstance in emergencies and everyday situations. However, COVID-19 proved that delegating national resilience – and therefore sovereignty – to international traders will only work until tested. The *laissez-faire* approach to emergency preparation has been exposed as inadequate in the most extraordinary global circumstances since the Second World War.

While state and national governments reacted quickly to the crisis, taking unprecedented actions to close international travel and domestic borders and impose sweeping restrictions on work and socialising, Australia may still need to learn the necessity of proper preparation and improved domestic capacity in its rush to return to normal. The swift and decisive action taken by the Federal and State governments[4] shows that collective action is both possible and practical when required, prompting questions about why similarly bold steps cannot be taken to counter other grave threats to the nation, for instance, climate change.

2. Global Access Partners, 2020
3. Organisation for Economic Co-operation and Development
4. Fitzsimmons, 2020; Koff, 2020; Porter, 2020

If resilience is the ability to adapt to a changing or unpredictable environment, we must also reinvigorate the fundamentals of our society to ensure it stays standing. As **Catherine Fritz-Kalish**[5] noted when opening the Summit, change is the only constant in life. For Australia to be resilient, every citizen must have the skills, authority and will to adapt to unprecedented and unpredictable challenges and a strong enough stake in society to want to defend it.

NSW Minister **Anthony Roberts**[6] praised State and Federal decision-makers for their 'strength, resilience and unrivalled persistence' in managing the cascading health situation, while Australia's Ambassador to the USA, **Arthur Sinodinos AO**,[7] noted Australia's ability to withstand earlier threats such as the global financial crisis. However, he went on to insist that the concept of resilience should now be applied in a much broader way to maximise the talents of every Australian citizen, increase economic agility and social inclusion, and give everyone the stake in society required to motivate collective effort and cohesion. Ambassador Sinodinos stressed the need to teach 'meta' as well as technical skills, for example, including the ability to think critically in an age of information overload and misinformation, to be empathetic as well as creative, and to work together for common goals as well as for individual gain.

A common effort to improve our economy should also boost domestic employment prospects and create high-quality jobs, reducing the economic insecurity endured by many casualised workers. Foreign demand for primary materials powered an unprecedented 30 years of national growth up to the start of 2020, but Australian manufacturing withered away in that time, and our economic reliance on China has been exposed as political tensions have intensified.

Therefore, many Summit participants backed a renewed focus on smart manufacturing[8] to diversify the economy and allow Australia to take charge of its economic destiny by adding value and commanding a premium in niche global markets. This transformation from primary and minerals producer to manufacturing powerhouse will require a culture that rewards risk-taking and entrepreneurship as well as competitive economic policy settings.

Strategies to improve Australia's industrial base, accelerate advantaged manufacturing and ensure adequate supplies of essential goods could range from preferential government procurement to improved skills training and new trade relations with allied nations, while improvements in defence must encompass the virtual as well as physical worlds.

In addition to these economic measures, NSW Resilience Commissioner **Shane Fitzsimmons**[9] also stressed the need for authenticity, honesty and clarity from our politicians regarding the issues and challenges we face. He called for evidence-based decisions, but also clear and constant communication on what is known and unknown to ensure public support when harsh measures are necessitated.

Australia's succession of recent disasters has underlined the need for better cohesion, coordination and leadership in government to give citizens, communities and companies the confidence they need to endure and recover, but better communication must work both ways. Bodies such as Resilience NSW and the *National Resilience Institute* proposed by the GAP Summit could play an important role by channelling information on vulnerabilities, stresses and recovery requirements from the grassroots to decision-makers.

5. Fritz-Kalish, 2020
6. Global Access Partners, 2020, p. 10
7. Sinodinos, 2020
8. Willox, 2020
9. Fitzsimmons, 2020

The Australian Government's announcement of $600 million in May 2021 to help Australia adapt to climate change and manage the disasters that come with it is welcome, and will help fund a new National Recovery and Resilience Agency.[10] Two hundred and ten million dollars will be spent on an Australian Climate Service initiative,[11] and these new organisations could help Australia align evidence, policy and practice in a more agile and targeted manner.

However, these spending announcements have not clarified how the Government plans to bring together Australia's experts in policy and practical emergency management to address the complex, evolving threats caused by climate change, land clearing, water depletion and urban sprawl.

At the Summit, **John Blackburn AO**[12] backed the creation of a broader Institute that would address strategic threats as well as natural disasters. He argued that planning for future eventualities of all kinds should be a national as well as state priority. The world is now less secure and more confused than at any time since the end of the Cold War, but the opportunity to integrate consideration of all these threats under a single umbrella has not yet been taken.

GAP prides itself on implementing, as well as offering, practical solutions and is now working to create the *National Resilience Institute* called for by the 2020 Summit and a range of workshops[13] organised by the Institute for Integrated Economic Research Australia (IIER-A).[14]

The proposed *National Resilience Institute* would undertake rigorous research on requirements, threats and capabilities regarding international threats and domestic natural disasters. This research would then underpin its independent, non-political advice to the community, commercial and political decision-makers. In step with GAP's Second Track process, the Institute would facilitate frank debate, share insights across silos and disseminate reliable information with the public as well as privately to improve shared awareness of current and future risks.

Just as the Second Track has employed strategies that evolved in international diplomacy to the domestic sphere,[15] the *National Resilience Institute* could apply well-honed military preparedness strategies to civilian planning as well as capturing the success stories of the COVID-19 crisis. Above all, it would strive to ensure that national resilience remains on the political agenda beyond the end of the current pandemic.

As well as stressing the importance of leadership at every level for adequate planning for future contingencies, the Summit recognised the importance of cultural facets in a resilient society.

There need be no contradiction between recognising the contributions of diverse groups to Australian success and maximising opportunity and participation for all Australians, old and new, with encouraging a new sense of national as well as community unity. The fostering of a risk-taking rather than risk-averse business culture should go hand in hand with more proactive government action in tackling current social problems as well as potential threats.

10. Commonwealth of Australia, 2021a
11. Commonwealth of Australia, 2021b
12. Blackburn, 2020
13. GAP/IIER-A/Gravity Consulting *National Resilience* project, https://www.globalaccesspartners.org/think-tanks/national-resilience
14. bid.
15. Fritz, 2019

RECOMMENDATIONS OF THE 2020 GAP SUMMIT ON NATIONAL RESILIENCE

Speakers and participants offered a range of actions for decision-makers, stakeholders and GAP alumni to progress across the Summit's three themes of Leadership, Governance and Resilience. These were headlined by the call for a *National Resilience Institute* – a permanent independent body funded by philanthropy, federal and state governments, and industry to demonstrate their joint commitment to work together for the common good.

National Resilience Institute

1. Establish an independent *National Resilience Institute* to conduct research, share data and advise on state and national policy. The Institute should:
   a. Develop comprehensive, evidence-based resilience frameworks which involve all sectors, including academia, business and not-for-profits, as well as State and Territory governments to bolster national and community resilience
   b. Facilitate frank debate, share insights across silos and disseminate information to both decision-makers and the public to improve shared awareness of current and future risks to the nation
   c. Learn from military preparedness strategies to drive cohesive whole-of-government policies to improve disaster planning and management in partnership with local communities
   d. Capture the success stories of the COVID-19 crisis and ensure that national resilience remains on the political agenda beyond the end of the current pandemic

Leadership

2. Recognise the contributions of diverse cultures to modern Australia and increase opportunities for every citizen to maximise the nation's economic potential
3. Foster a risk-based, rather than risk-averse, enterprise and public service culture and incentivise the commercialisation of research, investing in new capabilities and frontier technologies, from hydrogen power to quantum computing, to create new sources of value
4. Engage Australia's diverse communities in an honest and authentic debate and win their trust and confidence by demonstrating care for their welfare
5. Discuss long-term issues of national importance in state and national politics, with a view to agreeing practical and sustainable bipartisan solutions

Governance

6. Maintain a National Cabinet of Federal, State and Territory leaders to accelerate and coordinate decision-making on major national issues
7. Develop clear communication strategies to combat misinformation, maintain public unity, and build the case for stronger resilience measures
8. Allow companies to take an active social stance and support the wellbeing as well as productivity of workers in a challenging and changed environment

Resilience

9. Boost domestic production of essential goods through preferential government procurement
10. Add value in supply chains, modernise workforce skills and build stronger trading relations with allied nations
11. Improve cyber-resilience, given the increased reliance on digital communications and growing threats from criminals and hostile actors
12. Develop a more resilient mindset in young people through tailored educational approaches

REFERENCES

Blackburn, J. (2020), Building a more resilience nation, Keynote address at *A Vision for Australia*: GAP Annual Summit on National Resilience, https://www.openforum.com.au/building-a-more-resilient-nation/

Christofferson, C. (2020), Corporate governance in times of COVID, Keynote address at *A Vision for Australia*: GAP Annual Summit on National Resilience, https://www.openforum.com.au/corporate-governance-in-times-of-covid/

Commonwealth of Australia (2021a), A new national climate service for Australia, Media release by the Minister for the Environment; https://minister.awe.gov.au/ley/media-releases/new-national-climate-service-australia

Commonwealth of Australia (2021b), Helping communities rebuild and recover from natural disasters; Prime Minister, Minister for Agriculture, Drought and Emergency Management, Minister for the Environment, Joint media release, 5 May 2021, https://www.pm.gov.au/media/helping-communities-rebuild-and-recover-natural-disasters

Fitzsimmons, S. (2020), The time for resilience is now, Keynote address at *A Vision for Australia*: GAP Annual Summit on National Resilience, https://www.openforum.com.au/the-time-for-resilience-is-now/

Fritz, P. (2019), Second Track to Success, *BESS*™, vol. 1, no. 1, August 2019, https://www.globalaccesspartners.org/publications/Fritz_GAP_Journal_BESS2019.pdf

Fritz-Kalish, C. (2020), Building a more resilient Australia, Keynote address at *A Vision for Australia*: GAP Annual Summit on National Resilience, https://www.openforum.com.au/building-a-more-resilient-australia/

Global Access Partners (2020), *A Vision for Australia*: GAP Annual Summit on National Resilience, final report, https://www.globalaccesspartners.org/A_Vision_for_Australia_2020_Summit_Report.pdf

Herzog, S. (2020), Resilience – to be or not to be, Keynote address at *A Vision for Australia*: GAP Annual Summit on National Resilience, https://www.openforum.com.au/resilience-to-be-or-not-to-be/

Koff, E. (2020), Effective governance paved the way for a strong COVID response, Keynote address at *A Vision for Australia*: GAP Annual Summit on National Resilience, https://www.openforum.com.au/effective-governance-paved-the-way-for-a-strong-covid-response/

Porter, C. (2020), How Canberra contained the pandemic, Keynote address at *A Vision for Australia*: GAP Annual Summit on National Resilience, https://www.openforum.com.au/how-canberra-contained-the-pandemic/

Sinodinos, A. (2020), Working together to create a more resilient Australia, Keynote address at *A Vision for Australia*: GAP Annual Summit on National Resilience, https://www.openforum.com.au/working-together-to-create-a-more-resilient-australia/

Willox, I. (2020), Smart sovereignty is the key to Australia's future, Keynote address at *A Vision for Australia*: GAP Annual Summit on National Resilience, https://www.openforum.com.au/smart-sovereignty-is-the-key-to-australias-future/

LIST OF CONTRIBUTORS

WALTER DE RUYTER has over three decades of experience in health and aged care across a range of vocational disciplines, including nursing, midwifery and anaesthetics. He holds a Bachelor of Health Administration degree from the University of NSW. Walter has also been engaged in project work with University of Wollongong as an Honorary Fellow in the areas of Wellness and Knowledge Management. He is also a member of the Australian Government Consultative Committee on Knowledge Capital, a multidisciplinary 'second track' group facilitated by GAP. Walter's research areas include ways to mobilise a whole-of-community response to the challenges of an ageing population, particularly with regard to people's health and wellbeing.

DR JOHN DUMAY is Professor of Accounting at Macquarie University, Sydney, Australia. Originally a consultant, he joined academia after completing his PhD in 2008. His thesis won the European Fund for Management Development and Emerald Journals Outstanding Doctoral Research Award for Knowledge Management. John researches intellectual capital, knowledge management, corporate reporting and disclosures, research methodologies and academic writing. John has written over 100 peer-reviewed articles, book chapters and edited books, and is highly cited in Scopus and Google Scholar. He is the Associate Editor of the Accounting, Auditing and Accountability Journal, and Meditari Accountancy Research and Deputy Editor of Accounting and Finance.

OLGA BODROVA is the Chief Operating Officer and Director of Research at Global Access Partners (GAP). She has been working for GAP since its inception and is responsible for developing and coordinating GAP's research programmes and the production of reports and publications. Olga is also co-founder of Writing Partners and, prior to coming to Australia in 2001 and joining GAP, had a professional career in the media and arts industry. She holds a Masters Degree in Musicology from the Moscow State Tchaikovsky Conservatoire and a postgraduate degree in Media Arts and Production from the University of Technology, Sydney (UTS).

PETER FRITZ AO is Chairman of GAP, and Group Managing Director of TCG – a diverse group of companies that over the last fifty years has produced many breakthrough discoveries in computer and communication technologies. Today, TCG companies, and entities with TCG roots, employ over 6,000 people and generate annual turnover in excess of $1.5 billion. Peter's innovative management style and corporate structuring has led to the creation of a business model that is being copied by many successful entrepreneurs and has become part of university undergraduate and masters programs in business management in Australia and around the world. Peter chairs a number of influential government and private enterprise boards and is active in the international arena, having represented Australia on the OECD Small and Medium Size Enterprise Committee. He is the holder of seven degrees and professional qualifications, is a recipient of the Order of Australia, and has received many other honours.

PROF JAMES GUTHRIE AM is a Distinguished Professor at the Macquarie Business School. James has held positions at various Australian and Italian universities, in a career in accounting education that spans more than 35 years. He is editor of the highly regarded interdisciplinary accounting journal, Accounting, Auditing and Accountability, and has published 180 articles, 20 books and 45 chapters in books. He was Head of Academic Relations at Chartered Accountants Australia and New Zealand from 2008 to 2017, engaging with accounting academics and other stakeholders in the Australian and New Zealand higher education systems and providing thought leadership to benefit the wider accounting profession. In the international arena on his research topic areas, James has been actively involved with the OECD, European and wider academic communities, with his advisory work for the OECD dating back to 1998.

LES PICKETT is Chief Executive Pacific Rim Consulting Group. His professional career has taken him to over twenty countries and he has extensive practical experience in corporate governance, strategic business planning, mergers, acquisitions, enterprise restructures and reorganisations. He participated by invitation in a residential programme on 'Human Resources for Competitive Advantage' conducted by the Harvard Graduate School of Business Administration in Boston and is recipient of the Asia-Pacific Human Resource Development Award for outstanding contribution to the human resource profession in the Asia Pacific region. Les is a member Australian Government Consultative Committee on Knowledge Capital and International Board of Advisors to the International Public Management Association for Human Resources. Past roles include Chairman of the Human Resources Advisory Panel Productivity Australia, Director of the World Federation of Personnel Management Associations, International President of the Institute of Business Administration, Chairman of the Executive Board of the International Federation of Training and Development Organisations, International Awards Committee for World Initiative on Lifelong Learning, and member of the board of directors of the Australian Human Resources Institute.

PROF BRIAN SCHMIDT AC was appointed the 12th Vice-Chancellor and President of the Australian National University (ANU) in January 2016. Prof Schmidt is one of Australia's most eminent scientists. Winner of the 2011 Nobel Prize in Physics, alongside many other academic awards and distinctions, he spent most of his academic career as an astrophysicist at the ANU Mount Stromlo Observatory and Research School of Astronomy and Astrophysics. Prof Schmidt makes a significant contribution to public debate through the media, and via his membership of bodies including the Prime Minister's National Science and Technology Council. He received undergraduate degrees in Astronomy and Physics from the University of Arizona in 1989, and completed his Astronomy Master's degree (1992) and PhD (1993) at Harvard University. Under his leadership, in 1998, the High-Z Supernova Search team made the startling discovery that the expansion rate of the Universe is accelerating. Fellow of the Australian Academy of Science, the United States Academy of Science, and the Royal Society, Prof Schmidt was made a Companion of the Order of Australia in 2013.

PROF NATALIE STOIANOFF is a Professor and Director of the Intellectual Property Program at the Faculty of Law, UTS since 2008. She is the Chair of the Indigenous Knowledge Forum Committee, member of the UTS Commercialisation Advisory Panel, and is currently Co-convenor of the Technology and Intellectual Property Research Cluster and past convenor of the China Law Research Group. Natalie is also a Chartered Tax Adviser of The Taxation Institute and was a member of the NSW Board of the Australia China Business Council for 15 terms, including as Vice President and Chair of the Education Sub-Committee. Natalie's interdisciplinary research is concerned with new technologies including the legal, ethical and commercial aspects of biotechnology with research interests ranging from the Patenting of Living Organisms, Software and Business Methods, Protecting Traditional/Indigenous Knowledge and Culture, Technology Transfer to Environmental Taxation and Climate Change. She is the author of numerous publications, including the Lexis Nexis 2019 publication "Commercialising Intellectual Property", editor and author in the multidisciplinary book, Accessing Biological Resources, Complying with the Convention on Biological Diversity, and currently the managing editor of the newly formed Lexis Nexis series for the Indigenous Knowledge Forum. Her tax research has led to membership of the Edward Elgar Critical Issues in Environmental Taxation Editorial Review Board and is the Lead Editor of two publications from the series: Volume XVII, Green Fiscal Reform for a Sustainable Future - Reform, Innovation and Renewable Energy, and Volume XVIII, Market Instruments and the Protection of Natural Resources.

ANDREW TATRAI is a director of Australian Concert and Entertainment Security, one of Australia's largest risk management and security businesses. He has extensive experience in risk management in public event and major venue settings, as well as in terrorism preparedness. Andrew holds Masters degrees in Commerce (UNSW) and Risk Management (Monash), and is a PhD candidate at Macquarie University where he is researching complex adaptive systems to manage crowds in real time.

BESS™ GUIDELINES FOR CONTRIBUTORS

The Journal of Behavioural Economics and Social Systems focuses on the behaviour and interaction of economic agents in solving wickedly complex problems. It aims to transform economic thinking by challenging the prevailing concept of human rationality.

We welcome submissions that deal with a transdisciplinary social sciences approach, especially psychology, or use experimental methods of inquiry. Contributions in behavioural economics, experimental economics, economic psychology, social cognition, social networks, and judgment and decision making are especially welcome.

We publish manuscripts of various lengths and styles that might help us share leading-edge thinking.

We have three broad categories for contributors:

1. **Articles:** this is original research and should include methodology and references. This may be conceptual or empirical research; the latter requires discussion of methodology to the extent that someone could replicate it. These will be blind peer reviewed. 9,000 words max.
2. **Research notes:** this is the original work of the author or others bringing academic work into a format for general readership. This should be rigorous but does not need to comply with the academic standards of articles. Referencing should be minimal. These will be reviewed by the Editorial team. 4,000 words max.
3. **Essays:** this is opinion representing the ideas of the author. It should be thought-provoking and written in a manner that is intelligible to our generalist readership. No referencing is required. These will be reviewed by the Editorial team. 2,000 words max.

We welcome papers in any of these three formats, that help us share ideas about group problem solving, in particular.

There are five qualities we look for when evaluating what to publish:

1. **Expertise:** You don't have to be an academic. We welcome submissions from government, industry, and consulting.
2. **Evidence:** Our readers will want to know why they should trust your ideas. Showing supporting data or describing relevant examples is helpful. Case studies are also useful.

3. **Originality:** Aim to think outside the box. Readers turn to *BESS*™ is to discover leading-edge ideas. Try to be different.
4. **Usefulness:** Be practical. *BESS*™ readers seek ideas that will help them change the way they and their organisations actually do things. We want to make a difference by tackling problems that can change society for the better. Showing the reader how to apply your ideas in a real situation will make a difference.
5. **Writing that's persuasive and a pleasure to read:** *BESS*™ readers are practical, busy people. Try to capture their attention at the start by telling readers why they need to know this. Hold their attention by making your ideas easy to understand. While your ideas might be complex, your writing should be as simple as possible.

If you are considering a paper idea, try to answer these questions for yourself:

1. What is your central message?
2. Would your paper best fit as an academic article, a research note, or an essay? (see above guidelines)
3. What is important, useful, new, or counterintuitive about your idea?
4. Why do decision-makers need to know about it? How can your idea be applied in the real world?
5. What previous work or experience (either your own or others') does this idea build on?

This should help you design the structure of the proposed article. This will help you understand the logic of your argument and how it should flow. Please illustrate your points with real-world examples or provide one extended, detailed example, if possible.

GENERAL NOTES ON PROCESS

With a unique format blending the integrity of academic enquiry, the practical impact of solving wickedly complex problems, and the benefits on economic, policy, and social change, *BESS*™ integrates transdisciplinary perspectives in theory, practice, and policy. Launched in August 2019, *BESS*™ is published in print and online.

Papers will be reviewed, and authors will receive feedback within four weeks of submission.

Submit Your Paper

Send your manuscript to the editor at **editor@globalaccesspartners.org**

Thanks for considering working with us.

BESS™ STYLE GUIDE

MANUSCRIPT SUBMISSION AND FORMAT

Submit manuscripts to the editor at **editor@globalaccesspartners.org**

Please use Times Roman 12-point font. The document should be double spaced throughout; place page numbers in the bottom-right corner; and leave top and side margins of at least 2.5cm.

PUBLICATION OF ACCEPTED ARTICLES

Accepted papers are not copy-edited. Authors must edit final proofs.

FRONT PAGES

Under the title of your work, list authors' names, university affiliations or organisation, and complete addresses. Example:

AN EXCELLENT STUDY

A. A. MANAGEMENT SCHOLAR

Current University
Building and/or Street
City, State, Post Code

Tel: (000) 000-0000

Fax: (000) 000-0000

Email: scholar@univ.edu

ACKNOWLEDGMENT

If you wish to acknowledge financial support or other assistance, add a note at the bottom of your title page.

ABSTRACT

An abstract of no more than 200 words and the title of the work go on page 2. The abstract should address the five *BESS*™ qualities

1. Topic
2. Evidence
3. Originality
4. Usefulness
5. Persuasiveness

BACK PAGES

Group any references and appendixes, tables, and figures at the end of your manuscript. Continue your page numbering

HEADINGS AND SECTIONS

BESS™ uses only three levels of headings. Use Word-heading 1, 2 & 3 function.

Don't skip steps: no second-level headings before you use a first-level heading, for instance.

Examples:

Methods [1st level]

Data and Sample [2nd level]

Measures [2nd level]

Independent variable [3rd level]

Dependent variables [3rd level]

LENGTH

Articles should be a maximum of 9,000 words.

Research notes should be a maximum of 4,000 words

Essays should be a maximum of 2,000 words.

STRUCTURE

Articles should follow this paper structure (1st level headings only listed here):

1. Introduction
2. Literature review
3. Methodology
4. Findings
5. Discussion
6. Conclusion
7. References

Research notes should follow this paper structure (1st level headings only listed here):

1. Topic: what is the idea?
2. Significance: why is this important?
3. Innovation: what is new?
4. Relevance: why do managers need to know about it?
5. Application: how can this idea be applied?
6. Credibility: what should we trust this idea? (build on previous knowledge or experience)
7. Track record: where is the evidence? (case study or other)

While this structure is recommended, it is not essential. Authors may still submit papers if they do not wish to follow this structure.

Essays do not have to follow any particular structure. If in doubt, follow the structure of the research notes.

REFERENCING

BESS™ adheres to the Harvard Referencing Style Guide.

FOOTNOTES

Use footnotes placed on their respective pages (not endnotes).

TABLES AND FIGURES

The preferred format for regular tables is Microsoft Word; however, Acrobat PDF is also acceptable. Note that a straight Excel file is not currently an acceptable format. Excel files should be converted to a Word or PDF document before being uploaded.

Tables should be formatted as follows. Arrange the data so that columns of like material read down, not across. The headings should be sufficiently clear so that the meaning of the data is understandable without reference to the text. Tables should have titles and sufficient experimental detail in a legend immediately following the title to be understandable without reference to the text. Each column in a table must have a heading, and abbreviations, when necessary, should be defined in the legend or footnote.

Number tables and figures consecutively (one series for tables, one for figures). Place them at the end of your manuscript, but indicate the position of each in the text as follows:

Insert Table 2 about here

Each table or figure needs an introductory sentence in your text.

BIOGRAPHICAL SKETCHES

Each author of an accepted article is asked to submit a biographical sketch of about 70–150 words.

Your sketch should identify where you earned your highest degree, your present affiliation and position, and your current research or business interests. Authors should include an e-mail address.

Number tables and figures consecutively (one series for tables, one for figures). Place them at the end of your manuscript, but indicate the position of each in the text as follows:

Insert Table 2 about here

Each table or figure needs an introductory sentence in your text.

BIOGRAPHICAL SKETCHES

Each author of an accepted article is asked to submit a biographical sketch of about 70–150 words.

Your sketch should identify where you earned your highest degree, your present affiliation and position, and your current research or business interests. Authors should include an e-mail address.

GLOBAL ACCESS PARTNERS PTY LTD

ACN 000 731 420
ABN 74 000 731 420

PO Box 978 Strawberry Hills, NSW 2010 Australia

+61 2 8303 2420

editor@globalaccesspartners.org

Copies of this publication can be obtained by contacting (02) 8303 2420 or downloaded at
globalaccesspartners.org/BESS
journals.aau.dk/index.php/BESS

@BESSJournal

@/BESSJournal

@BESSJournal