

## **Transdisciplinary Leadership: Dealing with Wicked Problems, A Case Study from Australia**

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### **ABSTRACT**

While addressing social problems, and planning in general, the notion of “wicked problems” (coined by Rittel and Webber, 1973) is also applicable to complex organisational and social change issues that are currently challenging business and community leaders. The relentless drive for solutions, coupled with the desire to ‘get it right’ the first time, is straining the traditional or rational approaches to problem solving and leadership. In an effort to address the above, concepts such as cross-disciplinary, inter-disciplinary, and multi-disciplinary teams or thinking have been developed and deployed. However, these have fallen short of expectations. The concept of transdisciplinary leadership is drawn from systems thinking transdisciplinarity. Using action research and case study methodology, transdisciplinary leadership has evolved through a range of “complex wicked problems”. It also draws from in-depth interviews with a number of business and community leaders in Australia and USA who have successfully addressed “wicked problems”. This paper suggests that developing leadership strategies based on transdisciplinary thinking can benefit leaders tasked with dealing with wicked problems. A transdisciplinary approach offers a more effective approach to building knowledge, consensus, making sense of the complexity of issues at stake and ultimately delivering results with wider support and agreement.

**Keywords:** Leadership, organizational change, problem solving, systems thinking, transdisciplinarity

### **INTRODUCTION**

The media highlights daily the performance of national and global leaders as they are confronted by increasingly complex challenges, as the milieu within which leaders operate continues to undergo radical change. However, leadership research has, over the past 50 plus years, continued its focus on the relationships between tasks, roles, functions, contexts, and behaviours (Bass, 1990; Yukul, 1994; Zaccaro and Klimoski, 2001). An underpinning assumption is that leaders will adapt their leadership practices in response to the change in their milieu. Mounting evidence from decades of organisational, national and global crises would

suggest that leaders do not readily or easily adapt their practices as they are confronted by these increasingly complex leadership challenges.

A philosophical question raised over 20 years ago during an early career discussion on leadership, was whether leadership is an “Art, Science or Practice”. Clearly, there is no simple answer to this question. Of importance to the debate was the syntax of “practice”; that is “to practice” as a profession, or to “practice” as a musician or sportsperson, that is to expand, improve and enhance one’s skills, knowledge, and performance in different contexts.

The challenge is that many leaders appear not to “practice” to improve their leadership

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performance, rather, they continued, holding onto a past paradigm of leadership thinking, despite being faced with overwhelming evidence of a radically changing milieu. This paper is written with my reference to my involvement as a participant, facilitator, and leader across a wide range of Australian and international projects, such as:

- Developing the approach for a major policy research project Future of Work 2020 (Fayed and Pearce, 2008),
- Developing the strategy framework and shared vision across stakeholders for new specialist health business unit for a multinational bank,
- Facilitating and team coaching multinational finance organisation's strategy: Carbon Neutral 2010, and
- Facilitating a think tank on Military Health Ethics (Pearce and Saul, 2006).

All these have clearly highlighted the fact that the dominant "why and how" of leadership thinking and practice has essentially remained unchanged over the past sixty years.

This is best demonstrated by the current systems of supporting and marketing leadership theories or concepts to the broader population. Researchers are asked to capture "what is leadership" based on existing leadership theories, and observation of a comparatively small population. Successful leaders of the day are identified and also asked to distil their thinking on leadership. This is then marketed through books, publications and courses to a wider audience. However leaders, when confronted by new complex challenges, are asked how they view these challenges and "how they think about the leadership strategies required to respond to these challenges" suggest that current mainstream thinking on leadership is not helpful.

Hambrick and Fukutomi (1991) support this observation in their study of a Chief Executive Officer's (CEO) tenure, where they suggest that a CEO exists within a current paradigm and that this is impacted by two elements,

schema and repertoire. Schema is "pre existing knowledge systems a person brings to a job" (p.721). These systems are the personal givens, the conscious and unconscious preconceptions, beliefs, inferences, and expectations. They are derived from family experiences, culture, business experiences and networks, formal and informal education, and causal observation. Research indicates that a leader's values and belief systems have the strongest influence (Bass, 1990; Beck and Cowan, 1996; Montor et al., 1998; Yukl, 1994). Schema forms the perceptual and interpretive apparatus from which a manager or executive operates. This is the Art of Leadership.

This is balanced by a person's repertoire. Repertoire is the supply of skills, devices or expedients possessed by a person at any given time that is a person's "tool kit" (Hambrick and Fukutomi, 1991, p.721). This is the Science of Leadership. However, it is limited by the completeness or balance of the elements of the Science that a person considers either useful or not. Even though an element may be considered useful, a person may dismiss using it due to reasons such as lack of confidence or clarity of understanding. In some cases an element may be included within a repertoire however it may be totally avoided. So self-insight and related confidence will determine which elements of repertoire will be selected, used, improved, and new elements sought. This leads to the skills becoming the "tangible" ability of a person to apply their repertoire within a given context.

Clearly the interrelationship of these two elements, schema and repertoire, influences the practice of leadership, and feedback from the practice informs these elements. Any shortcoming in leadership paradigm thinking will critically limit a leader's ability to make sense of and identify with new, complex and at times unique challenges being presented in the current dynamic environment of the 21<sup>st</sup> century.

The aim of this paper is to add a perspective to leadership practice, specifically dealing with complex challenges, while being informed by the art (personal nuances, aesthetic judgement, and interpretations) and the science (theories,

models, and concepts drawn from different disciplines) of leadership. Specifically the focus is on leaders tasked with the strategic responsibility of leading complex challenges such as radical change, sustainability or building strategic capability and capacity (*see* Collins and Porras, 1994; Denison et al., 1995; Finkelstein and Hambrick, 1996; Jaques and Clement, 1994; Wheatly, 1992; Zaccaro and Klimoski, 2001).

### **WICKED PROBLEMS: 21<sup>ST</sup> CENTURY LEADERS' CHALLENGES**

Leadership has been a multi-discipline and multi-paradigm field of study for some decades. Bass (1990) and Van Seters and Field (1990) present detailed evidence of this evolutionary development. Senge (1990) questioned traditional leadership theories and their approaches based on the assumption of "people's powerlessness, their lack of personal vision and inability to master the forces of change" (p.340). Yukl (1999) notes the limitations of many early leadership studies by using a two factor relationship such as task versus orientation or autocratic versus participative or transformational versus transactional. Yukl (1999) importantly argues that this approach is an over simplification of what is in essence a complex function, the processes involved in an effective leadership practice.

Additionally this extensive body of work on leadership in essence focuses on the elements of the organisation and so achievements at the functional element of a business or organisation. This is totally in line with the Newtonian reductionist principles applied to business, strategy and leadership. It is not intended as a criticism of the works, rather an observation that each represents the research paradigms and strategies of the period in which they were the focus and undertaken. Unfortunately these do not provide insight into dealing with wicked problems.

Drucker (1968), Schön (1971), Ackoff (1981), Nohria and Berkley (1994) and Stacey (1996) are representatives of the discussion on the need for management to develop thinking and means, to better manage and cope

with increasing discontinuities or complexity. One early landmark work that continues to hold relevance to understanding the challenges of leading, via their discussion of planning in environments of complexity, is Rittel and Weber (1973) and their notion of "wicked and tame" problems.

Rittel and Weber (1973) identified ten distinguishing properties of wicked problems. Of these, the problem has no definition, it is in essence unique, and as such has no single solution. The "right solution" may be not only misleading but also meaningless. It is important to highlight that these problems are complex, not complicated. These terms are often interchanged.

Complicated problems have an identifiable structure, which can be understood given time and expansive knowledge of all the interrelating disciplines that make up the parts. They represent a large-scale collection of many simple or tame problems; however, because of the nature of scale, they are not reducible to a simple problem. The structure, if any, is generally externally imposed and with a focus on one element of the total problem.

Whereas complex problems have no clear structure and in essence are difficult to understand. This structure is emergent, and can only be achieved given appropriate open interaction between the actors and elements of the total system. "There seems to be a growing realization that a weak strut in the professional's support system lies at the juncture where goal-formulation, problem-definition and equity issues meet." (Rittel and Weber, 1973, p.156).

A summary comparison of complicated and complex problems is in Table 1.

A challenge confronting leaders of large organisations is that managers in general tend to build complication into business structures and operations. As the natural rate of change increases so does the complexity of the issues confronting the leader. Performance demands to present appropriate, relevant, and immediate solutions merely increases the leaders dilemmas. Schön (1971) and Stacey (1996) also highlight the glaring fact that as complexity increases,

TABLE 1  
 Characteristics of complicated and complex problems

Complicated problems	Complex problems
Have defined form or structure	Do not have well defined form or structure
Structures determine relationships	Structures and relationships are dynamic and interactive
Have clear dimensions and variables for which we have current knowledge	Dimensions and variables are not known due to lack of clarity of the problem
Have a high degree of certainty	Have uncertainty and ambiguity
Assume a static environment	Occur in dynamic environments
Understanding is based on convergent rational linear cause – effect thinking	Understanding requires divergent holistic systemic thinking
Have many “right” alternative solutions that can be determined through reduction and analysis and rationally linked	Have many possible solutions, none of ultimately right and they emerge through a process of divergent thinking and synthesis

predictability decreases, with the result that solutions and systems generate unknown and unintended consequences, and newer, more complex problems. The complexity of these so-called problems generates additional issues such as how to build consensus on agreed outcomes across different groups or stakeholders with the continual expression of we must get “it” (the solution) right. This notion of “rightness” raises the interpretation of what is ethical or fair, for each stakeholder group, further compounding the issue.

Supporting this practice for rightness is the observation by Shapiro (1988), who is perhaps the first person to suggest “clumsy institutions” in his argument that when institutions, or their leaders, are presented with complex problems they are also presented with opposing definitions and interpretations of the wicked problem and associated solutions. It is the expectation of having to choose one definition and solution that leads to this notion of clumsiness.

Ghoshal (2005) presents a landmark paper, in what has been a publicly muted debate, on the role bad management theory has played over the past fifty years. I would extend this to include leadership theory. It also provides insights into the notion of clumsiness with his critique on the influence of bad management theories, through the “pretence of knowledge” and

“ideology penetrating disciplines” as leading to “excessive truth-claims based on partial analysis and unbalanced assumptions” which has been influencing the practice of managers (pp. 76-77).

While Ghoshal was reflecting on the high profile demise of Enron, the continuing Global Financial Crisis perhaps amplifies his case a thousand fold. The role of “positivism” cannot be understated, as Ghoshal (2005) citing Milton Friedman perhaps best captures the management and leadership dilemma we currently find ourselves in:

*Don't worry if the assumptions of our theories do not reflect reality; what matters is that these theories can accurately predict the outcomes. The theories are valid because of their explanatory and predictive power, irrespective of how absurd the assumptions may look from the perspective of common sense. (p. 80)*

Following on from the above view, is the underpinning assumption that leaders engaged in solving wicked problems are, and will continue, to be evaluated on their performance. That is their ability to present a solution. The solution’s “rightness” appears to be driven by the underpinning views of the world held by the

different stakeholder groups, their timeframe, agendas, and apparent lack of due consideration of the downstream impacts these solutions will or may have.

The role of performance management is based on rational decision making thinking. It assumes a single linear predictive path of cause and effect. This rational predictive logic dictates that interventions are possible, trade-offs made and solutions with their results known.

Adding to the leader's dilemma is the use of vertical organisational structures and divisions that operate on single disciplinary thinking and often with a notion of controlling an element of the complex challenge that is within their specified domain. The clumsiness of rational cause and effect thinking with vertical organisational divisional structures influences leader behaviour and with short term market demands, requires leaders to present "the solution", so further blinding a leader's ability to see that they are increasingly being confronted by complex problems and that there are other possibilities or views of the world.

So what has influenced leaders thinking, and how have "bad management theories" evolved to dominate our understanding and thinking. The exchange between Ferraro et al. (2005) and Bazerman's (2005) coupled with Ghoshal (2005) provides great insight into how and why leaders of organisations have been influenced, over the past two or so decades, into seeking rapid short term solutions at the expense of a more balanced exploration of the issues. Clearly leaders cannot merely rely on theories and thinking that led to this situation as providing solutions to this wicked problem.

One initial observation of leaders engaged in wicked problems, was whether they resorted to attempting to control the solution by using a single line of thinking and action, or engages in understanding the problem through knowledge building and collaboration processes before acting. Clearly there is a time constraint; however, even in periods of near crisis, what I will term "effective complex challenge leaders" continued to use the latter approach.

So while wicked problems or complex

challenges suggests a holistic approach to viewing an issue, management and leadership education and development presents a segmented reductionist approach, through individual subjects, theories and models as a trade off – one or the other. I am reminded here of my early training as a navigator and the debate between round earth and flat earth paradigms. We actually live with both; it depends on what we are doing as to which paradigm we draw from, global travel, building a bridge or a short trip across town. Why then do we persist with the notion that one paradigm is better or "in date" as compared to another?

This paper represents the emergence of a new paradigm, one that in Kuhn's (1962) terms is the blending of past multi-paradigms and has evolved into a new research and paradigm for leadership practice.

## METHODOLOGY

The failures of cross-disciplinary and multi-disciplinary teams to address wicked problems led to the notion of transdisciplinary. The concept of Transdisciplinary Leadership evolved from a twenty-year longitudinal case study of personal experience of leading and facilitating complex change projects within a range of different industry, business and social settings as well as semi structured interviews with noted business and community leaders.

Action research and a single case study using multiple sources of evidence was used to investigate the phenomenon of leaders dealing with complex challenges in actual life settings and within a comparatively real time (Yin, 2003). Patton (2002) notes a single case study is suitable where the case represents a critical test of existing theory or where the case is a rare, unique test of existing theory or serves a revelatory purpose.

Multiple sources of data representing significant projects over the twenty-year period were collated to support the study's validity and reliability (Yin, 2003, p.21). Data collected included notes and reports from a sample of thirteen significant projects that involved unique

complex changes. I was engaged in all these projects as leader, consultant or facilitator. Examples of these projects include: being the lead internal staff officer for placing women at sea in the operational command of the Royal Australian Navy, for radical technological change for a book and news printing organisations, for project teams restructure and cultural diversity program for a multinational aeronautical manufacturer. In addition, I led a team in developing a framework of Military Health Ethics in response to allegations of health professionals being involved in the torture of prisoners of war and co-facilitator, and also was the team coach for a multinational finance organisation's strategy, Carbon Neutral 2010.

In addition to these projects, I conducted a number of in-depth and on-going semi-structured interviews with business and community leaders. This data collection and analysis process enabled for sense making, testing, and feedback of emerging ideas and finally the Transdisciplinary Leadership concept. Table 2 presents a summary of the research process.

**TRANSDISCIPLINARY LEADERSHIP:  
AN EVOLVING THEME**

The idea of transdisciplinary first emerged in early 2005 while working on the think tank for military health ethics. After reflection on a previous concept "macro leadership" failed to adequately address issues within projects where potential outcomes were either, watered down by tradeoffs between different actors unable to understand each other's position, or projects that failed, because belief structures failed to see alternatives. Involvement with the practice of forming multidisciplinary, cross-disciplinary or inter-disciplinary project or problem solving groups also failed in different ways to address the issue at hand.

Checkland (1981) noted the need for transdisciplinary concepts to unify knowledge so that it is applicable to areas that cut across traditional academic boundaries. He does note that interdisciplinary teams would not solve this issue. Drawing from the environmental movement who have engaged in transdisciplinary thinking, Funtowicz and Ravetz (1991) note the

TABLE 2  
Data collection and method

Level of analysis	Unit of analysis	Sources	Criteria for interpretation
Macro – the complex problem	Researcher	Primary: documentation both archival and current Secondary: reflective notes and on-going testing and engagement of concept	Researcher's methods of enquiry, sense making and continuing motivation for further engagement with wicked or complex challenges
Meso	Client organisations	Primary: Observation and engagement with client groups Secondary: client internal reports and verbal feedback	Client culture, response to change and feedback
Individual	Business unit leaders, team members and identified leaders	Primary: semi-structured interviews and some questionnaires Secondary: observation and third party documents	Espoused views of the complex challenge bring confronted, mental models and views being expressed, feedback on change process

limitations of reductionist and mechanistic thinking and assumptions about the way this thinking presents relationships. They also note the normative effect of societal values and how they affect stakeholder inputs at one end and how there is an expectation that science will deliver certainty. The challenge we are confronted with is that we seek “science” to solve or explain all problems, however, as indicated by the notion of “wicked problems”, not all problems can be solved by science, as they are not all caused by science, rather they are problems produced by the side effects of created systems and subsystems.

The International Center for Transdisciplinary Research, from their Moral Project (1987), describes transdisciplinarity as:

*Transdisciplinarity is not concerned with the simple transfer of a model from one branch of knowledge to another, but rather with the study of isomorphisms between the different domains of knowledge. To put it another way, transdisciplinarity takes into account the consequences of a flow of information circulating between the various branches of knowledge, permitting the emergence of unity amidst the diversity and diversity through the unity. Its objective is to lay bare the nature and characteristics of this flow of information and its principal task is the elaboration of a new language, a new logic, and new concepts to permit the emergence of a real dialogue between the specialists in the different domains of knowledge. (www)*

Transdisciplinarity as a concept would appear to be still emerging and evolving.

### **TRANSDISCIPLINARY LEADERSHIP STRATEGIES: SENSEMAKING, EMERGENCE, FACILITATING**

Unravelling the leadership required to deal with complex challenges is much like the “Blind men of Indostan” (Blind Men and the Elephant; John Godfrey Saxem, 1878), each vested actor or stakeholder gropes for truth and reality, each being right in that what they are describing, each being logical or plausible. However, attempts to improve, or provide a solution or resolve an issue, in isolation is flawed in that none actually sees or understands the entire system; the elephant. Solutions may be effective for their own areas, however the consequences to other areas of the system are unknown and not considered. People are rewarded for work that has the potential to destroy the system (see the cases of US finance organisations related to Global Financial Crisis, NAB trading losses, Bearing Bank, Enron, Toyota and Ford Vehicle Recalls and Ajax Fasteners Australia).

Transdisciplinary Leadership identified a framework of leadership strategies to guide a leader’s practice. These strategies engage a fluid process of divergent to convergent thinking and action. The critical leadership challenge is recognising when to switch between these thinking and acting practices.

The underpinning success factor for this approach is that leaders and their associated stakeholder networks have a degree of clarity and agreement on what they aspire to be and, just as importantly, what they desire not to be.

Fig. 1 represents the Transdisciplinary Leadership strategy cycle. The preliminary identification and understanding of the complex challenge presents the starting point for a leader to determine the leadership strategies needed to build a systemic understanding of the challenge from the position of different actors or stakeholders. The ability to engage stakeholders is influenced by the capacity and capability of the different stakeholders and their existing mental models.

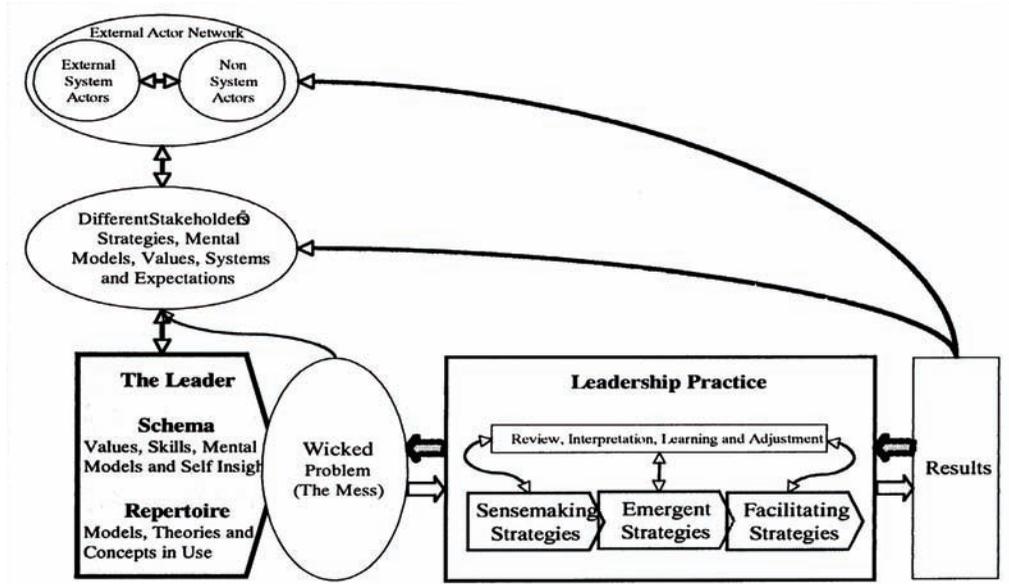


Fig. 1: Transdisciplinary Leadership Strategy Cycle

The Transdisciplinary Leadership approach is best described, as taking the complex challenge to a meta-level, a level that exists above the separation of the stakeholder disciplines. Leaders develop transdisciplinary leadership strategies through the use of a number of tools and techniques with the objective to cross the boundaries or borders created by single disciplines to produce understanding, insights and perhaps new knowledge relevant to the complex challenge and issues at hand.

*Sense-making Strategies: Divergent Thinking*

Sense-making is a paradigm, involving how to reduce ambiguity, to socially determine understanding and meaning of the wicked problem at hand. As indicated by Weick (1995) the strategy is about understanding how the different stakeholder groups construct meaning as data is converted into usable information and then knowledge.

How a leader engages with the total system is critical. This requires extensive periods of challenging all stakeholders to engage in

“divergent thinking processes”. This can be exceptionally challenging, if not virtually impossible, for disciplines skilled and rewarded for almost instant convergent solutions thinking. It focuses on open-ended future oriented questioning aimed at exploring, inquiring, examining, explaining, and enticing as diverse as possible views on the issues at hand that make up the wicked problem.

Sense-making has a number of objectives, however, these must be linked to the organisation’s overarching strategic aspiration, or more simply put “to what purpose can we use this knowledge?” Essential elements within this process include:

- Understanding the nature of the wicked problem and associated issues from different perspectives.
- Understanding how the system is currently attempting to respond to the wicked problem.
- Understanding how the wicked problem arose based on the thinking or mental models in use within the system.

- As best as possible present clarity of sense of the issues as they impact on all stakeholders.
- Clarity of the current systems strategic capabilities to address the wicked problem.
- Maintain the tension created by the paradoxes present within the challenge.

A key element here is ensuring that leaders need to understand how meaning is ascribed and interpreted by different disciplines to wicked problem. Misunderstanding, confusion, and misinterpretation often occurs within organisations, cross-disciplinary teams or multi-stakeholder groups, when disciplinary jargon, acronyms, or unique meanings of terms are used. This requires extensive open conversations and workshops, mostly facilitated, to ensure clarity of message, understanding of the issues and most importantly trust to develop the next stage.

This demands an astute understanding by the leader of their personal capabilities and the capabilities leaders require from others to complement the leader's strengths to understand the problem and issues at hand. It is imperative that the leadership team and their critical stakeholders have significant levels of trust and agreement of future strategic aspirations. Failure to achieve this will ensure failure in any endeavours. It is also essential that the leadership team remain open to all ideas and suggestions; that is their thinking remains divergent.

To date this has been a facilitated process. Tool and techniques used in this process include:

- Featuring tools such as scenario development
- Strategic arena mapping
- Story telling
- Strategic conversations
- Semi structured interviews
- Open space workshops
- Appreciative inquiry
- Soft systems methodology

This is highly time-consuming for leaders. Experience suggests depending on the type of challenge being confronted and levels of trust between key stakeholders that these strategies will require between 50 to 80 percent of a leaders time actively engaging with stakeholders in different forums.

The most successful strategies have involved developing snap shot scenarios of possible futures supported by strategic arena maps and using these during one-on-one interview meetings with key leaders from each stakeholder group. This allows for a full discourse, building an understanding of the stakeholders' current mental model and aspirations, as well as establishing their initial position on your aspirations. It is the initial step in building trust.

As key leaders within different stakeholder groups are engaged, they need to become part of the broader leadership team so that the final leadership team has the greatest potential to make sense and build knowledge. This in reality is an ongoing strategy, as different leaders will be required at different stages to address the wicked problem.

This has proven to be the most critical phase, a phase that literally defines success or failure in responding to the problem in a meaningful way. One critical element has been the leader's ability to recognise and approach groups who are non-stakeholder actors, but have the power to derail positions taken by vested stakeholders. These can include activist groups, disenfranchised customers, competitor industry groups or even overseas groups. Early engagement with these non-stakeholder actors has proven successful in building and sustaining long term relationships and trust, which have paid unexpected benefits over the course of each relationship. For example in developing the issues paper and planning for the think tank for military health ethics we engaged via one on one interviews for the first time, all elements of the Australian Defence Force, different veterans units, department of Veterans Affairs, different health specialist groups, NGOs such as Red Cross and Médecins Sans Frontières

and key participants from Canada, UK and NZ who had experienced past military ethical problems. This led to clarity of actions needed by all stakeholders and built critical relationships where they had previously not existed.

These sense-making strategies perhaps identify the success or failure of successive actions. It must be an engaged and shared process.

### *Emergent Strategies*

Whereas sense-making strategies focus on divergent thinking to build shared understanding and awareness, emergent strategies focus on an awareness of the new learning and understanding that is generated from the interactions of the different stakeholders. As described by Gladwell (2000), there is a time, a tipping point, where significant knowledge and understanding of the system has been built to explore possible solutions. This occurs when the initial leadership team engages a critical mass of stakeholders to build a new logic. This ideally should be a spontaneous positive event. However, experience demonstrates that some people go through periods of perturbation as they struggle with paradigms or mental models that do not provide the answers or understanding. This is perhaps best identified by the work of Clare W. Graves (Beck and Cowan, 1996) and his identification of the cycle through which people travel, where previous mental models or value thinking systems no longer present working solutions to the problems encountered.

The power of the leader at this stage is to recognise the emergence of new knowledge and understanding happens through sense-making interactions between stakeholders and actors over time. To date this has only been achieved during workshops, think tanks, round table meetings after significant research and engagement or open space processes. Tool and techniques used in this process include:

- Mind mapping / Pattern recognition
- Synthesis

- Feedback systems to test new knowledge and understanding (workshops, focus groups, workplace café meetings)
- Stacey (1996) What / How matrix

### *Facilitating Strategies*

Facilitating results represents the convergence or agreement on action required to address the complex challenge as it is currently understood. Implementation is clearly the task of many, however, the role for transdisciplinary leaders is to maintain a strategic oversight of the systems and how the solutions are progressing. This is linked with ensuring the systems and organisational environment are conducive for success.

Leaders have the responsibility and accountability for the systems that in essence, control the organisation's operations. The dynamic nature of wicked problems and hence solutions often means that possible or plausible solutions in one operating context will not be plausible in another. The critical role of transdisciplinary leadership is to understand the often-subtle differences in context across organisations and their stakeholders and effectively adjust the systems as required. The leadership approach required here is one of innovation and experimentation. It is one of moving the resources to respond to the problem. Unlike environments that foster risk aversion or low risk where outcomes are expected within a predetermined set of boundaries, here outcomes will be more generic. The leadership approach and strategies are perhaps similar to testing or experimentation, especially if the problem is unique and therefore never seen, or experienced, by the leadership team. Critical here are the establishment of:

- meaningful metrics and modelling systems that provide as close as possible to real time feedback information;
- an "early warning system", one designed to pick up early indications of impending issues; and

- Systemic capability to change direction quickly or engage additional resources as required.

In part, this is the establishment of learning systems across the network, and also building a capacity and capability to deal with ambiguity and uncertainty. A further benefit of this approach is understanding how this approach has worked and building success stories to share across the network.

### **INSIGHTS FROM TRANSDISCIPLINARY LEADERSHIP APPROACH**

The Transdisciplinary Leadership framework has been used in response to a number of complex organisational and social challenges, examples as noted above. It continues to be used and refined. The insights gained from this process to date include:

- Within the overall decision cycle time, greater emphasis and time is spent on divergent, sense-making activities. Early engagement with stakeholders has proven increased quality in decisions with greater buy in from all stakeholder groups. The process has achieved positive initial results in three to six months on complex problems that had been in a protracted state for some years;
- Non organisational actors can disrupt the process if not identified and engaged early;
- The need for clarity and understanding of stakeholder network relationships is critical;
- Building trust across the stakeholder network is critical, especially where significant mistrust exists especially over long time periods; and
- Where current capacity and capability to respond to the wicked problem is lacking, capacity and capability development time must be factored into the response. It is important to collaborate with strategic stakeholders who may include direct competitors.

### **FURTHER RESEARCH**

Transdisciplinary leadership process has identified a number of additional areas for further research. These include:

- Application of systems thinking and complex problem awareness to leader development,
- Continued application of systems thinking within general leadership research,
- Engagement of transdisciplinary thinking in professions and disciplines that regularly interact with complex challenges,
- Understanding different tools and techniques to effectively engage leaders in complex problems.

### **CONCLUSION**

This journey has been a voyage of discovery across a wide range of disciplines to gain an understanding of the views held by leaders and researchers of wicked problems confronting their discipline. It is interesting that the notion of wicked problems has transgressed across a number of disciplines and that they resonate with similar leadership issues. This paper is an attempt to distil these leadership issues and present a summary of leadership strategies based on experience in using transdisciplinary leadership approaches.

What is clear is that no one person can satisfactorily manage the process of confronting significant challenges alone. Transdisciplinary leaders need to have around them others who complement their abilities, provide diversity in thinking and discipline experience, and they can trust. It is claimed to be lonely at the top, but no one can remain effective as a leader if isolated from any source of support. Transdisciplinary leaders create strong networks and sounding boards as sources of sense-making and knowledge as they explore different perspectives on wicked problems.

Complex and wicked problems need a collaborative approach to understand the systemic issues. Failure to do so means leaders operating in isolation will continue to present

solutions that are biased and lead to extremes. The more this happens the more polarised people within any system will become.

Transdisciplinary leadership is a leadership paradigm focused on leadership practice that engages leaders to consider the dynamic nature of the system within which they are engaging. It is a framework of continuous learning:

*What we have learned  
Is like a handful of earth  
What we have yet to learn  
Is like the whole world.  
(Hindu prophet Avvaiyar)*

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