# Using systems thinking tools to help Australian managers increase their capacity for perception

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## Abstract

Suggests that a major shift in the way organizations are currently managed is required if Australia wants to enhance its future competitive position. Australia needs to capitalize on its perceived strength of being hard working, flexible and innovative while overcoming its lack of strategic perspective. Discusses two case studies where the application of systems thinking tools and the surfacing of mental models have helped managers overcome their short-term thinking and start to take control over their own futures. The case studies demonstrate how it is possible to start surfacing mental models and for the participant to learn how these affect the organization. The major learning is that the tools can be applied to most types of organization, no matter how far down the "learning organization path" they have travelled. The key is how the tools are applied and how skilled the facilitator is in creating a safe and open environment for reflecting and exposing mental models. The case studies show that the application of systems thinking tools can be rewarding and as a result we encourage practical experimentation.

## Introduction

For Australia to enhance its future competitive position, a major shift in the way we currently manage our organizations is required. This paper focuses on how an organization can use systems thinking tools and the surfacing of mental models to overcome Australian managers' short-term view and lack of strategic perspective.

According to the *Enterprising Nation Research Report* (Industry Task Force on Leadership and Management Skills, 1995), it has become obvious that Australian industry needs to take a different approach to managing organizations domestically and globally into the future. We need, to a larger degree, to capitalize on our perceived strengths of being hard working, flexible and adaptable as well as innovative/inventive.

Today, these strengths do not unfortunately always produce the expected benefits because of Australian managers' perceived weaknesses of having a short-term view and a lack of strategic perspective. We are, as a result, not good at spending our energy on issues that really matter or focusing our innovative skills on the areas that will drive future competitive advantages. According to the *Enterprising Nation Research Report* (Industry Task Force on Leadership and Management Skills, 1995), the short-term focus can lead to Australian managers becoming followers rather than creators, forced to react to circumstances created by others.

There is a major opportunity for Australian managers to improve their effectiveness. The highlighted weaknesses of having a short-term focus and lacking strategic perspectives can be overcome through the introduction of systems thinking tools (see Appendix). The tools provide the managers with opportunities to improve their ability to perceive their own behaviours and the systems they operate within. This is an essential first step in implementing sustainable improvements and changing an organizational culture. This paper will explore how, using systems thinking tools, we can help managers understand their current reality and how to create an improved organization.

It is vital that organizational improvement efforts are focused on removing the root causes to problems, not just the symptoms. In other words we need to move from a single-loop learning to a double-loop learning

environment, where a single-loop learning environment represents a focus on detecting and correcting errors while a double-loop learning environment is focused on questioning the underlying assumptions and policies before taking corrective action. According to Argyris (1977) a single-loop culture does not normally move towards double-loop culture without a sense of a crisis or revolution taking place. However, a consultant can, for instance, help to create a double-loop environment, either as a "micro culture" while an improvement project is under way or as part of a bigger cultural change in the case of a change management effort.

We should be able to start the process of uncovering the root causes we need, according to Maturana and Varela (1992), to increase our level of reflection and start to question why we know what we know. This is in line with Senge (1990, 1992), who believes it is not reality that matters, but the model of reality, because the model will be the basis for our action. The problem is not that we have mental models, but that we are unaware of their existence (see Appendix). Most of the corporate paradigms and sacred cows are "inherited" assumptions which will affect the way we perceive the world and, as a result, the way we act.

The lack of strategic perspective among managers creates an important role for a consultant. The consultant needs to help clients to understand their own mental models and how this affects the way they act and what options they have for resolving problems. Schwartz (1992, p. 35) states "Mindsets tend to keep us from seeing the appropriate questions to ask about a decision". As a result the consultant's external frame of reference and skill set becomes vital during the process of surfacing mental models and extending the client's capacity for perceiving into the future. In our work we have found a high degree of support for Senge's (1993) statement that "Maybe the whole purpose of this systems thinking stuff is nothing but expanding our capacity for perception…".

To help managers perceive their current working reality we use systems tools to help surface their mental models at the same time as we create a safe enough environment for double-loop learning to take place. Figure 1 describes graphically our working model for interacting with our clients.

**Figure 1** A double-loop learning environment is created through establishing a safe enough environment to allow the surfacing of mental models through the application of systems tools like causal loops and the five whys (see Appendix)
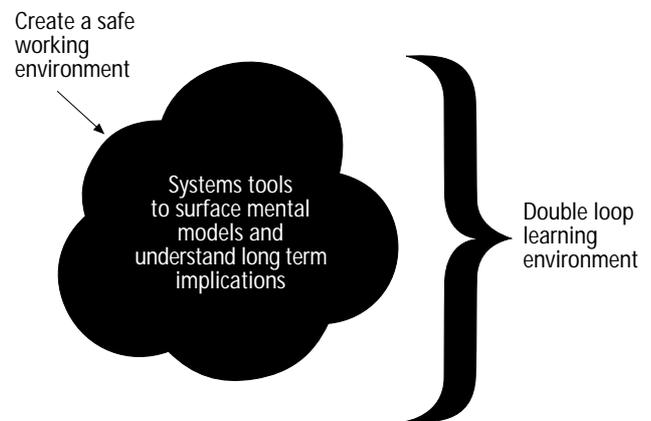


The rest of this paper describes two case studies where, as external consultants, we helped clients improve their organizations through the use of systems-thinking tools and surfacing of mental models. The first case study focuses on how to create a "micro culture" of double-loop learning quickly during a business process re-engineering (BPR) project, while the second case study focuses on how the same tools have been used to create cultural change within an organization.

## Case study 1 – business process re-engineering project

### Consultant and client relationship
The client we worked with is a major retailing and financing company with over 400 employees. Their existing market shows very limited growth and the client's profitability has been slipping over the last couple of years.

### Client perception of problem
We were brought into assess the progression of an internal business process re-engineering (BPR) programme. The client felt that the BPR project had been progressing very well, and it wanted an independent body to verify its opinions. It was particularly interested in how well the BPR project would help to ensure the long-term viability of the organization.

### Approach
We quickly discovered, the BPR project had been carried out detached from relevant strategic issues facing the organization and without sufficient understanding of the

dynamics the organization was caught up in. Our major concern became how to help the management team to see and understand what was going on. As a result we decided to use causal loops since they are powerful tools to describe underlying problems facing an organization. Figure 2 describes one of the problems discovered.

The high fixed cost structure combined with the history of the organization to grow through diversifying the product range had, over time, created a very complex and overhead-intensive operation.

The recent slow down in the economy, coupled with lack of available new product range were major reasons for recent poor profit performance. The organization was for the first time seeing the true underlying profitability of the business! (The previous growth had always "overstated" the profitability.) Basically, the organization could not run fast enough around in the diversification loop to offset the cost of the heavy infrastructure. The discovered classic "quick-fix that backfires" (see Appendix) was nick-named "feeding the monster".

The causal loops were discussed with the management team. We built the case loop by loop and discussed the consequences. We stayed away from jargon and broke some of the stricter rules for drawing causal loops (e.g. do not include direction in the steps). The aim was to create such a powerful message

Figure 2 The "feeding the monster" highlighted how the expanding of product range drives infrastructure costs



Key
✗ = Time delay

that they had to listen and think about the implications, and not get caught up in the technicalities on using the tool. We believed the understanding of "feeding the monster" was vital for the organization's long-term viability. If the organization did not understand the implication of this archetype, the re-engineering activities would temporarily reduce the size of "the monster", but it would slowly grow back to its full strength!

'…Our aim was to create a "micro culture" within the BPR team of a learning environment. We knew it would not be easy, since the culture of the organization was very controlling and anyone challenging the conventional wisdom was punished. However, we believed that to undertake a successful re-engineering activity, the BPR team had to be working in a "double-loop" learning mode!…'

We were successful in getting the management team to understand how "feeding the monster" and the other major issues needed to be resolved to ensure the long-term viability of the business. As a result the BPR activities had to be refocused to take into consideration the need to break out of some of the existing mental models for how to manage the business.

We then started to work with both the management team and the re-engineering team. Our aim was to create a "micro culture" within the BPR team of a learning environment. We knew it would not be easy, since the culture of the organization was very controlling and anyone challenging the conventional wisdom was punished. However, we believed that to undertake a successful re-engineering activity, the BPR team had to be working in a "double-loop" learning mode!

So we started to build the required "micro culture". Two fundamental issues needed to be addressed: skill levels within the team and creation of a safe learning environment. We used surfacing and testing of mental models as the key vehicle to teach the skills and start the double-loop learning process. In the beginning we used our own credibility as a way of protecting the team. It was much easier
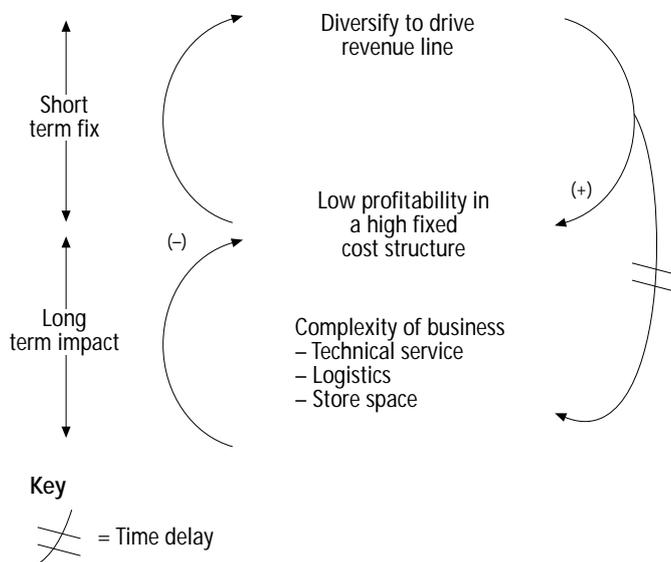
for the organization to handle that we challenged old habits rather than the team itself. We worked with the team to highlight mental models and decide on the ways to collect data to confirm their usefulness. Some "sacred cows" got killed in the early days, which allowed for improvements in the re-engineered processes. The team got really excited and the desire for questioning, clarifying and testing grew every week. A knowledge-seeking team had been born!

The main tools we used with the team were questioning (the five whys), graphical representations and causal loops of what drove different aspects of the business. Our main tasks in the beginning were to challenge the team and help to come up with ways to test discovered assumptions. Our roles changed over the three months from driving the process to becoming more of a coach and sounding board.

> '…It was agreed that the rest of the organization needed to become more involved in testing and improving the proposed new designs. The issue was: how do we get a large proportion of staff involved in internalizing the proposed changes and giving useful feedback…'

Creating a learning environment within the BPR team was relatively easy, since we worked very closely with the team and we could build their skills and desires over time. However, we were required to use a different approach for the interaction with the rest of the organization. It was agreed that the rest of the organization needed to become more involved in testing and improving the proposed new designs. The issue was: how do we get a large proportion of staff involved in internalizing the proposed changes and giving useful feedback, keeping in mind the controlling culture and the consequence of the re-engineering process leading to downsizing in some areas?

We decided to run workshops using de Bono's (1986) "six hat" methodology since it provides a very useful framework for exploring a controversial topic. The workshops were very successful. They allowed people to express different views without getting stuck in the normal debate about who is right and wrong. The processes were explored in a very constructive way and any major issues of disagreement that could affect the success of the project were highlighted. These issues were later investigated and resolved. The outcomes from the workshops were that the proposed new processes were improved and a much larger group of staff understood and supported the re-engineering activity.

### Client outcomes

The design of the new processes are completed, including highlighting required mind-shift for operating the new processes. A business case that would rejuvenate the business was created and approved by the board and the implementation phase has just started. However, we believe it is vital that the ongoing learning environment continues to achieve a successful implementation. The team recognizes its own role in keeping the questioning and the knowledge seeking going and the managing director has agreed to take on the role as the reinforcer of the team. We will also stay in touch with the team, mainly as a sounding board and a source of expert advice.

## Case study 2 – alignment and cultural change

### Consultant and client relationship

We entered the consulting relationship on the pretext of offering core marketing advice – as an expert consultant. After a heated discussion with the executive team, it became obvious that more fundamental problems existed beyond their marketing capabilities.

The organization is a growing niche outsourcing organization and has a varying number of employees, 1,000 full-time staff and up to 250 casual/contract staff depending on projects and plant capacity.

The client has a reputation of being able "to make anything happen". This mindset coupled with a task and short-term business focus puts tremendous pressure on the internal systems. The client's customers from a recent survey demonstrated dissatisfaction with quality of output and turnaround of service. Two fundamental musts for the business – "doing it right and doing it right on time" were not being met and yet employees worked 12-hour days and shifts worked overtime.

## Client perception of problem

At first the executive team perceived the problem as not being within their organization. They perceived the board of directors as interfering and inconsistent in the direction it was setting for the organization. The client was convinced that it was not master of its own destiny. We heard the phrases "we are a unique business" and "the board has no understanding, they won't let us do…" repeated many times.

At the beginning of our relationship we had a client who was in denial and was looking outside for blame and for answers.

## Approach

The challenge was to help the client understand and see patterns of behaviour and cultural norms that had been established. It was essential to challenge the client's mindset, its paradigm of how the world is or should be. Using causal loops in the first stage was a powerful way to establish a more accurate view of how the organization was operating.

After dissatisfaction with the current management practices had been established it was time to give the client new concepts and tools to help them move to a better way of operating. The tools used included total quality management principles to overcome the lack of data, priority management to ensure a balanced focus, and value based marketing and strategic planning to overcome the existing fragmented approach to planning and their lack of communication between the different functions to break out of their current paradigm.

At each stage of the intervention we allowed time for reflection and supported personal awakening and acknowledgment of how the organization was operating (involvement from the team is extremely important for long-term commitment). Our role as a process consultant was to provide a safe environment where all participants could be open and challenge the process, themselves and each other, which is consistent with Schein's (1987) view on process consulting.

The executive team and branch management teams were the leverage areas to begin the change in culture. Accordingly, the first workshops were scheduled with these senior teams and then a roll out of the same approach was planned and conducted for all layers in the organization, including shop floor.

## Reinforcing loop example

The client culture works in a "vicious cycle" (see Appendix) from when a new job comes in through to when the next job arrives. The culture is based on "doing" and as a consequence there is no time for planning, prevention and forecasting.

When a new job comes in it comes in the form of a quality brief, which may be incomplete in a number of different ways, e.g. inaccurate data, unrealistic timing expectations. A reactive approach is taken since there has been little planning. For each new job, pressure builds up and most time is spent catching up, fire-fighting and trying to meet deadlines. There is no time in between to standardize processes, approaches or fundamentally improve systems. Figure 3 describes the vicious fire-fighting loop in which the client found him/herself trapped.

Once the vicious cycle was created on a flipchart for all to see, quite an amount of relief was released from the group. Most members of the group knew subconsciously that what they were doing was not productive but they were unable to espouse it or see it clearly. Using diagrams such as causal loops helped teams to see how they actually operated and why they were frustrated.

When the team realized that its own behaviour and systems reinforced the vicious cycle it was in, it became motivated to take some ownership to break that cycle. We have found this is to be particularly true for high level teams such as management teams.

## Balance loop example

An effective usage of a balancing loop (see Appendix) was developed with a functional

**Figure 3** The client is caught in a vicious cycle of "do", "fire-fight", "do"
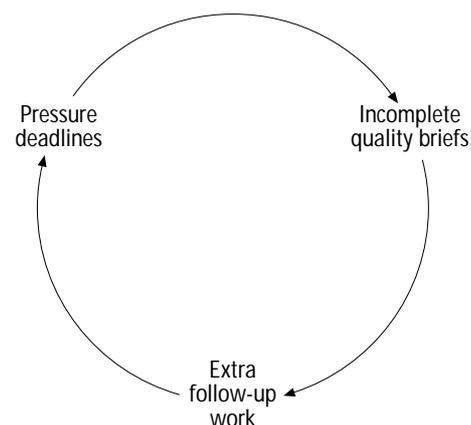
team that had extremely high people turnover, high pressure levels and spent most of their time fire-fighting. This team, client manager's department, was made accountable for an entire project yet had no influence or control over the sales or production departments. The balancing loop is described in Figure 4.

By using a shifting the burden archetype (see Appendix) the team realized that the real fundamental problem of individual and team accountability, workflow and process improvement had not been addressed. They had only shifted the surface problems to the client manager's department.

Causal loops are exceptionally useful in helping clients realize how effectively or ineffectively they actually operate. From this point you have a model, a frame of reference that the whole team can refer to. This enables the team to move forward together with the working paradigm.

Other tools that were useful to help the client break the vicious cycles and from shifting the burden included double-loop learning, e.g. asking yourself how much value am I creating from this activity and for which customer am I creating value and ladder of

Figure 4 Shifting the accountability to the client manager took away the focus of improving the workflow and building interdependency between functions



inference (e.g. why have I locked on to this perception of someone and something)?

## Client outcomes

Each workshop conducted has planted seeds within each team and commenced the change in culture. To sustain the workshop learnings, each individual needs to reflect and reinforce his/her personal change. The organization also needs to reinforce the change through appropriate systems, policies and management/leadership. The change created was within a micro culture within the walls of that particular workshop. To enhance the success of sustained change, coaching work is continuing with senior management and internal facilitators are being trained to sustain a role of internal "conscience".

## Conclusions

In our work we have found Australian managers to be accepting and open to genuinely improving their organizations. Most managers' willingness to put trust in the consultant, and to try new approaches, has led us to believe that the use of system tools and surfacing of mental models will help managers to move forward no matter what level of maturity the organization has reached. (The maturity level will mostly determine the speed with which changes can be made and how much "jargon" terminology can be used.)

As stated in the Enterprising Nation Research Report (Industry Task Force on Leadership and Management Skills, 1995), it is time for Australian managers to move from the "old" to the "new" organizational paradigm, moving away from vicious circles and organization discipline to virtuous circles and organization learning.

It is effective and rewarding to use systems thinking tools to create an environment allowing double-loop learning. We have found this to be true even when operating within a mainly controlling culture. The key learnings we have made along the way are:
- to lead by example (have an enquiring mind and allow them to challenge you);
- stay away from jargon;
- build skills;
- coach; and
- be pragmatic (worry about the intent more than perfect application of the tools).

We also believe our experience with the use of the tools is applicable to non-consultants as
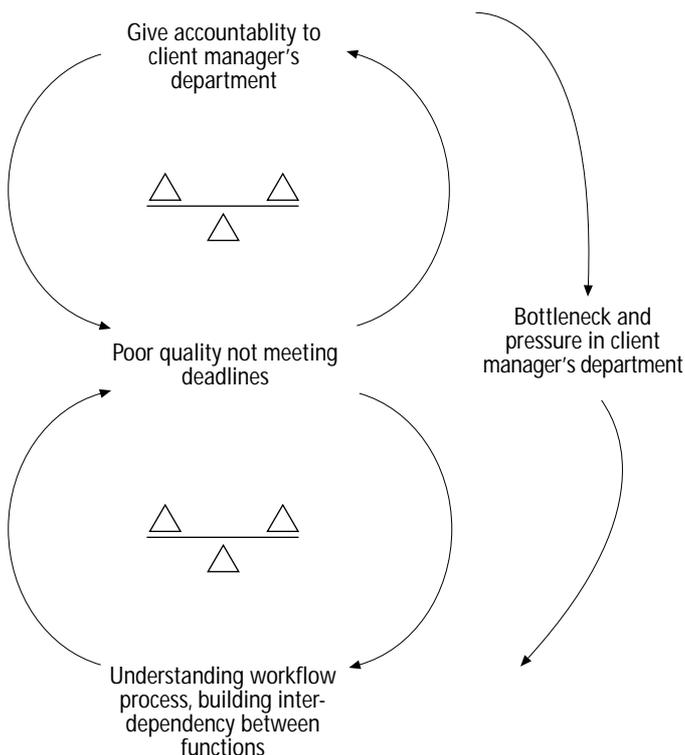
long as the person in question has an enquiring mind.

This article has sought to bring attention to the fact that the actual application of mental models and systems tools can be successfully applied by an individual within his or her own circle of influence. We encourage the readers to continue to apply the tools, learn from the experience and share their new-found knowledge with others.

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## Appendix

The discussed tools are briefly described below. For a fuller description, please refer to the references provided.

(1) *Systems thinking tools* (Senge *et al.,* 1994). Systems thinking tools encompass a large and diverse range of tools which focus on the interrelatedness of forces and their part of a common system. The tools are particularly valuable as a language for describing the current situation and identifying root causes. This article uses causal loops, archetypes and the five whys.

(2) *Causal loops* (Senge *et al.,* 1994). A pictorial way of drawing how different variables affect each other. The intent is to draw the feedback loops to clarify how one element is both a "cause" and "effect" at the same time! The two most common loops are reinforcing loops and balancing loops. The reinforcing loop generates exponential growth (like an interest bearing account) or decline while the balancing loop ensures resistance forces are activated to eventually limit growth (like the body temperature).

(3) *Archetypes* (Senge *et al.,* 1994). Archetypes, as used within the system thinking framework, are a selection of generic structures (based on causal loops) which cover the most commonly experienced organizational situations. The case studies reference "quick fix that backfires" and "shifting the burden" (see Figures A1 and A2).

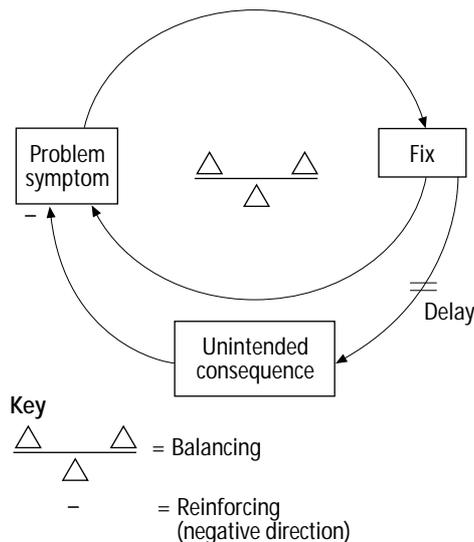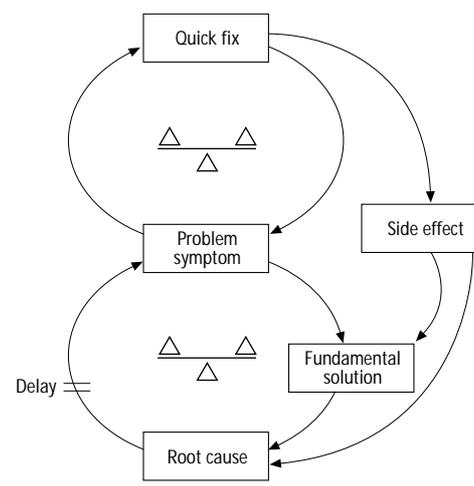**Figure A1** Generic "quick fix that backfires" template



**Figure A2** Generic "shifting the burden" template

(4) *The five whys* (Senge *et al.,* 1994). A very simple but powerful tool. Start with the symptom and ask "why is this taking place?" Repeat the process for each of the answers that seem likely. You will most likely find that they are converting and you have succeeded in taking the symptom back to a few underlying root causes.

(5) *Mental models* (Senge *et al.,* 1994). Mental Models are used within many disciplines including management literature and cognitive psychology. It is claimed the modern use of mental models was coined by Scottish psychologist Kenneth Craik in the 1940s.

(6) *Six thinking hats* (de Bono, 1986). The "six thinking hats" were developed by de Bono as a methodology for parallel thinking. Parallel thinking refers to a topic being explored in parallel in two different ways:

- The topic is viewed from up to six different viewpoints using the different coloured hats (varying from pure information to intuition).
- Everyone in the group uses the same coloured hat at the same time, e.g. the group thinks in parallel.

It is a powerful tool to explore a topic, and is especially useful when people have a wide range of opinions, the topic is "controversial" or a better understanding of the thinking in a certain area is needed.