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# Learning from Loops - Applying CLD to Identify Leverage Points as Organizational Learning

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## Abstract

In this paper submitted to the special session on “System Dynamics and Organizational Learning: purposes, practices and pitfalls”, we describe a system dynamics intervention using the principles of Group Model Building to uncover the deep-seated issues in a long-standing problem area of an organization. In describing this intervention, we will outline how we used causal loop diagrams to represent the system in focus and identify leverage points for improvement. This intervention is positioned as part of an organizational capability-building program involving a university postgraduate degree. This paper will analyse our learning in the context of the research question outlined in the special session proposal.

## Overview

In his call for papers to the special session on “System Dynamics and Organizational Learning”, Max Visser raises several key issues regarding the goals of system dynamics modeling and the achievement of learning. In this paper, we describe a system dynamics intervention to uncover the deep-seated issues in a long-standing problem area of the organization. In doing so, we contribute to the understanding of the level of learning that can be achieved by a careful analysis of this intervention. The paper is presented as a narrative case study to enable fellow system dynamicists to understand the context and approach. It concludes with an analysis that is a comparison to the literature on organizational learning.

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## **The Organizational Environment**

The case study is positioned in Monyx Pty Ltd (hereafter referred to as Monyx), a medium-sized student services organization within Monash University which is based in Melbourne, Australia. The “service provider” businesses that Monyx operates for the university include careers and employment services, student affairs services, student rights, welfare assistance services, student co-curricular programs, sport and recreation services and facilities, clubs and activities, bookshops, a range of retail services and food and beverage services.

Monyx commenced trading in August 2003 following a start up phase that involved a complex merger. The merger involved eight organizational entities, five different accounting systems and multiple employers and employment instruments. Using the language of system dynamics, the context was one of complex interactions and interrelationships, with multiple feedback loops containing embedded lag effects.

Of note is the challenge associated with the merger was that none of the existing accounting and finance systems had capacity to provide for the new organization. A new accounting system was thus required whilst at the same time continuing to trade using the pre-existing systems. It is this challenge of moving from five accounting systems to one that is the focus of this paper.

## **Operational History of the Case Study**

The merging and integration of eight organizational entities and five different accounting systems during 2002-2004 was not without its challenges. Over this period, several different managers had focused on improving the performance of the finance reporting and processing function within Monyx, however despite some short-term improvements and changes, various service provider business leaders continued to express concern and frustration about financial reporting and processing support for their work units. The locally driven improvement projects that were conducted each had client representative involvement, yet despite some short-term improvement, the dissatisfaction levels from clients would reappear. In appraising the situation, the CEO expressed frustration with a perceived internal communication breakdown and an increase in what Argyris (1991) calls defensive routines. Despite earlier work done on building skills in dialogue and the intentional design of physical spaces for constructive conversations, the real story remained hidden from view.

Frustrated with the lack of success with interventions for improvement to date, the CEO reviewed these various improvement initiatives undertaken to date. Many of the interventions followed a recurring pattern that began by using a “now – where – how” representation of the problem or situation, with many of these problems fitting the description of firefighting as outlined by Kim (2001) and Repenning et al. (2001). As an expression of a gap analysis, and as a simple balancing loop, as system dynamicists, we know that this simple dynamic will lead to goal seeking and improvement behaviour if all elements associated with the system-in-focus had been considered.

The CEO’s assessment was that the improvement project teams had drawn a far too narrow system boundary to define the problem domain in these earlier attempts to improve service delivery and the increase in the associated defensive routines provided and indicator that finance was operating as a closed system (Emery 1981).

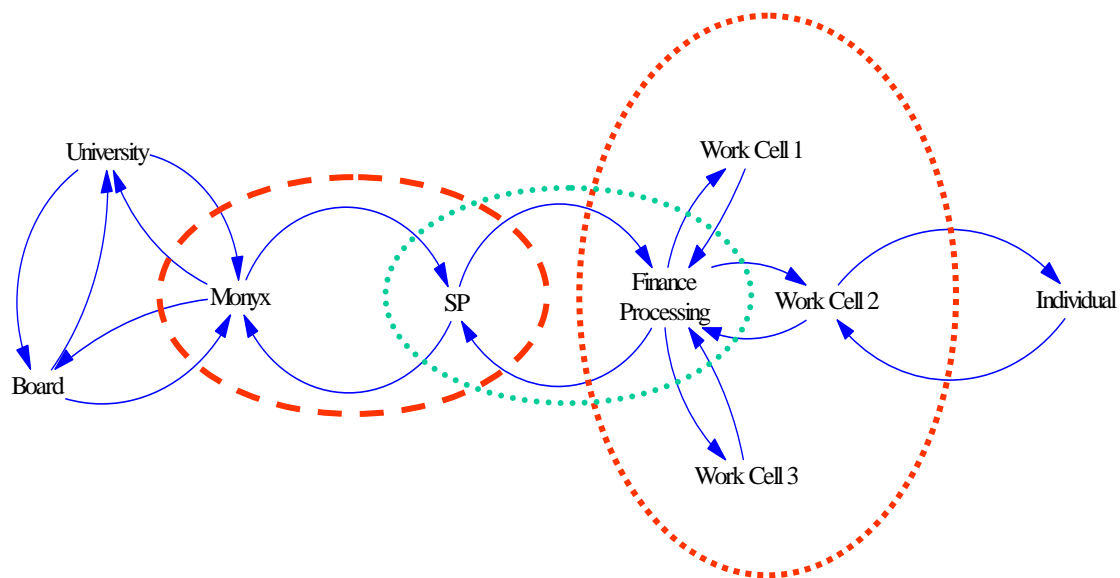
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What became apparent was that a systems-informed inquiry into our finance problems would treat the entire finance group as a system and thus we needed an intervention methodology that acted with a principle of systems integrity. The principle used was that systems perform the way they perform because of the way they are structured. The elements of systems are linked together, where every element can affect, and be affected by, every other element in the system by what are referred to as feedback loops. This principle was fundamental in choosing our approach.

Therefore, in October 2004 the CEO initiated, led and participated in a project to “*map the finance system*”. A team of staff from across the organization was brought together to conduct what emerged into a Group Model Building project. At the macro level, the group was asked to map the finance challenge to create shared understanding of the issues involved, identify short-term actions that would lead to long-term solutions, involve the finance people and wider organization in identifying agreed leverage points, and develop an implementation plan for long-term solutions.

Figure 1 below is an early representation as a “stakeholder diagram” of the key parties in this project was developed by the project team as part of the process of understanding the high-level relationships that existed in the problem and to assist in drawing the “system boundary” of this problem (Churchman 1979). In this diagram, we show the relationships between Monyx, the University and the Monyx Board. Monyx has a number of Service Provider (SP) business units, who are in turn serviced by Finance and related processing services, divided into a number of work cells, each staffed by individuals.

**Figure 1: High-Level Finance Stakeholder Diagram**



As a systems thinking and system dynamics intervention, the systems mapping approach using causal loop diagrams was chosen because of the organisation’s prior exposure to systems thinking as well as through an executive development program that was underway at that time.

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A primary interest in the design of that executive development program was the transfer of classroom-based learning to practice within our organization. In designing the program, a challenge was to identify what (infra)structures provides stability and continuity for organizational learning to occur whereby students as practicing managers could leverage the program to diffuse and consolidate their individual learnings and practices? Running parallel to the formal three years of structured classroom learning, we wanted to have organizationally structured opportunities to apply the learnings from the program. This paper is the case study report of one such applied opportunity.

### **Reflection, sense-making and making sense using causal loop diagrams**

As a new entity, Monyx was engaged in a significant cultural transformation associated with becoming a values-based organization that valued learning and included the goal of creating a learning culture with a commitment to becoming a Learning Organisation. Specifically, Monyx aims to have learning as an element central to all its activities so that as it takes action, it learns what worked and what didn't, reflecting on why but also striving to improve through continuous improvement.

This philosophy of “learning (y)our way forward” is central to and consistent with the organization's approach to learning and knowledge accumulation.

Learning by reflecting on our experiences and how we make sense of those experiences has been another central idea adopted by Monyx – the idea that we retrospectively make sense of a situation after the event, and how we may have contributed to that situation. By integrating elements of our physical culture with social practices of reflection and review with conversational capacity to support team learning using dialogue, we have had a base upon which to have constructive conversations that deal with the otherwise undiscussable issues and defensive routines that block learning (Argyris 1999; Argyris and Schon 1996). Consistent with the idea that sense-making occurs retrospectively (Weick 1995), the ‘stock’ of organizational knowledge is seen as continually being refreshed through processes of selection and retention as learning, as well as unlearning that comes from conversation.

As a retrospectively imposed structure on our experience, Monyx has made extensive use of what are variously referred to as influence diagrams (Coyle 2000) and causal loop diagrams (Senge 1990; Senge et al. 1994). Preferring to use the latter term, Monyx has made significant use of causal loop diagrams to make sense of organizational action. A causal loop diagram is a form of knowledge and while expressed diagrammatically, is often accompanied by a narrative as a set of events linked together sequentially. The logic of a system dynamics narrative is not “if – then – else...” rather it is a sequential “first – second – third...” logic where the sequence of events implies a plot of a story.

As part of this approach, the organization has developed an awareness of systems archetypes (Kim 2000; 2000; Kim and Anderson 1998; Kim and Lannon 1997; Wolstenholme 2004) and used them for understanding day to day challenges. For example, in 2003 the central communication device in a Monyx Board paper revolved around a causal loop diagram, locally referred to as the “Tragedy of the CAF” that explained how competing parties in the organization were competing against each other for increasing resources, with the unintended consequence of student fee increases reaching a threshold limit beyond which further rises were not able to be automatically

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applied. This had the added advantage of legitimizing the use of system dynamics method of causal loop diagrams at a strategic level in the organization.

### **Background to the Group Model Building Project Team and Methodology**

The project team, akin to a Group Model Building team (Richardson and Andersen 1995; Vennix 1996) was drawn from inside the organization and consisted of four members, including the CEO as sponsor. All members had previous experience in system dynamics causal loop diagramming, with one member having almost ten years experience that included formal simulation modeling expertise. None of the members were members of the local Monyx finance team. This was done to minimise any perception of pre-determined outcomes.

In this facilitation, systems thinking gave the Group Model Building (GMB) team the insight to inquire into how we as facilitators contributed to creating a space and climate and behaviour set, and to improve our own behaviours to improve the quality of conversation. We wanted a place where we could “diffuse tensions” and “air” and “share” in safety.

The methodology chosen was one of semi-structured group interviews using a list of short prompting questions to act as conversation starters however, outside of appointed times for stakeholder participants to join the GMB team; the interview structure was highly fluid and contextual. In designing the process we felt that as facilitators and modelers, if there had been a communication breakdown then if we begin our attempt to understand what appeared to be a difficult and complicated issue by asking leading questions, then we actually could be contributing to a defensive reactions from others in the group. Therefore, we framed our interviews by recognizing the value of questions for learning (Brown 2002; Marquardt 2005). The GMB team promised confidentiality and that apart from asking a few prompting questions, our facilitation would focus on listening and further questioning would be for clarification. In an advocacy/inquiry sense, the primary mode of behaviour would be inquiry (Senge et al. 1994)

The Group Model Building approach has been well documented in the literature for example, (Richardson and Andersen 1995; Vennix 1996) a special edition of the System Dynamic Review (1997 – Vol 13 No 2) on Group Model Building. While it is recommended that the five roles – a facilitator to monitor the group process and to elicit group knowledge, a modeler/reflector to focus on the model building, a process coach to focus on the dynamics of the GMB team, a recorder to write down the groups processes as a basis for later reflection and learning and a gatekeeper who is close to the client group and who takes responsibility for the project – are distinct and essential, with a GMB team size of four there was an obvious potential for overlapping membership of roles. In fact, what we had was akin to a Venn-Diagram where there were multiple overlapping roles with different people moving in and out of roles based on the situation.

This was a unique situation – the group had modeling expertise and all members were all organizational insiders undertaking “insider research”. All had significant experience in the conduct of group processes for eliciting information and drawing out individual perception of elements of the problem. There was joint process facilitation responsibility – no one had an appointed role, yet all performed this role both in the larger group process and with the participants. What was further novel was that the

gatekeeper role as sponsor was a member of the GMB team. This group did not use the gatekeeper role. Thus, rather than managing across all five roles, the group was able to focus on the remaining four roles to maximise the data gathering element of the project

As the interviews were conducted, each GMB team member acted in all roles informally. The modeler/reflector activity was the least active of the four roles. During the two days of data gathering interviews, it was more important to be facilitating the group elicitation process than have a focus on getting the detail of the model correct. The interview setting was a large room with circular table and chairs and whiteboards. Some participants simply spoke and engaged in a dialogue with the GMB team, while others chose to use whiteboard representations of their interpretation of the facts as they saw it. A stand-out example used to describe the situation made use of a rich pictures (Checkland 1999; Waring 1996) as shown at Appendix 1. The power of this “rich picture” as a diagrammatic summary is that it uses images of grenades, brick-walls and locked doors to represent some of the interpersonal issues and relationship dynamics that one person feels occur in this system. It leaves all parties with no doubt as to what the key issues and variables may be.

Each interview session was followed with a GMB team debrief of the group processes and what key data items were gleaned. This was a deliberate process step by the GMB team. The focus was on gathering data and sensing, and actively resisting moving to making sense of the data and beginning to develop any concept models prematurely. This was done explicitly to avoid what is referred to as the anchoring and adjustment bias/heuristic (Vennix 1996).

Towards the end of the second day, the GMB team prepared an overview of issues to the stakeholders, which included those interviewed from the finance team and wider organization. Table 1 provides a summary of the issues raised during interviews.

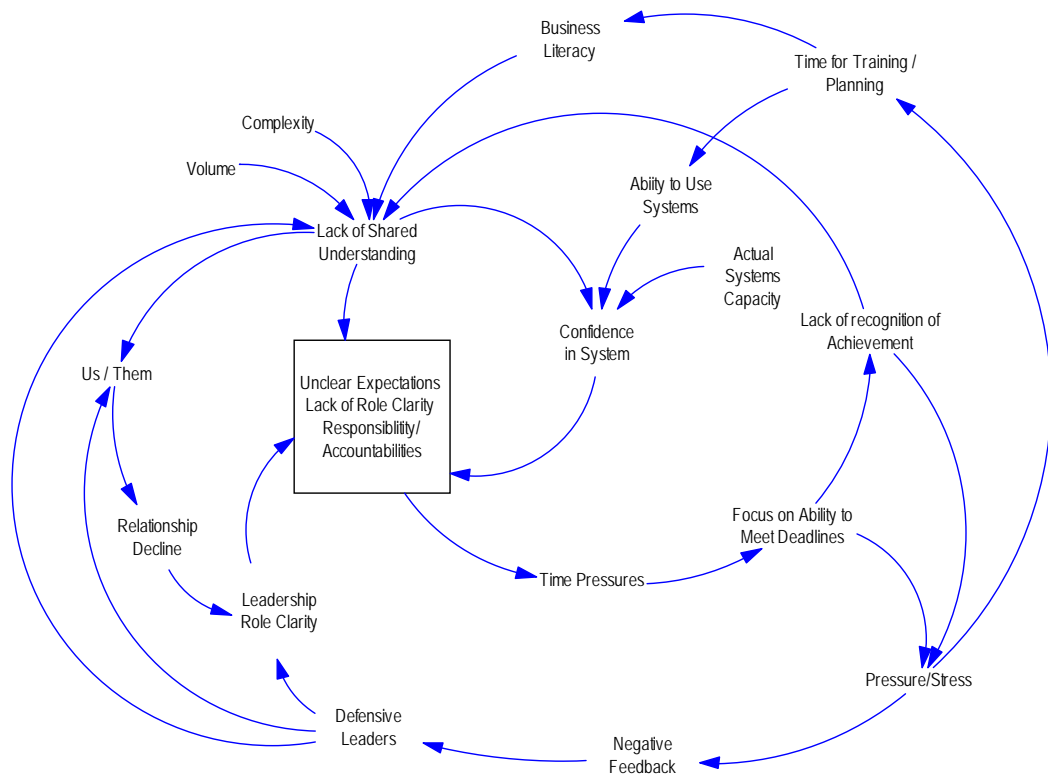
**Table 1 – Issues identified in interviews**

High degree of complexity.	Delays from outside finance derail finance.
Almost zero margin for error.	Lack of understanding of the whole system.
Lack of shared vision and direction.	Lack of confidence in accounting system.
Finance as a closed system.	Pressure to contain cost of finance.
Delays and inaccuracies.	Need to plan and find role clarity.
Different finance systems across the business.	Short-term appointments.
Damaged relationships including open hostility.	Us and them mentality.
Concerns over leadership – outside group.	Concerns over leadership – inside group.
People afraid to raise issues.	Concern over time taken.
Attack - constant criticism from outside.	Defense and blame – your fault not mine.
We can't make a difference.	Giving up, someone else will fix it.
Lack of senior manager and CEO input.	Too much senior manager and CEO input.
Wrong company structure.	Problems with some software.
Fatigue.	Project creep.
Lack of feedback to finance.	Feedback to finance not heard or accepted.
Acceptance of poor performance.	Lack of understanding of interconnectedness.
Low and falling morale.	Band-aid solutions.
Multiple and conflicting stakeholder priorities.	Lack of resources.
Loss of confidence.	Constant firefighting.
Lack of recognition for achievement.	Poor business literacy outside finance.
Focus on short-term deadlines only.	Lack of time for training and planning.

**Source: Authors**

A number of systems archetypes were evident within the issues outlined. The breakdown in relationships and increasing hostility were recognized by the GMB team as representing the escalation archetype (Kim and Lannon 1997) represented by a spiraling cycle of blame and defensive reactions amongst a number of the parties. Also noticeable was a giving up or reliance on others to solve problems and the subsequent reinforcement of this behaviour as others solved problems. The GMB team recognized the shifting the burden archetype (Kim and Anderson 1998) as a useful explanation of this dynamic. Drifting goals and the tragedy of the commons (Kim 2000, 2000) were amongst the other archetypes identified and these insights assisted understanding the “wicked” problem facing the organization.

As part of this review the GMB team presented a “first cut” or “in the moment” causal loop diagram with a view to telling the story they had discovered it from the interviews. Figure 2 outlines this loop diagram.



**Figure 2: Initial Loop diagram**

Whilst generally well received and validated by most participants, one of the finance leaders reacted with hostility and suggested that the real issue was complexity and that the loop diagram as presented totally overlooked this issue. Whilst recognizing this as a valid perspective, the GMB team took the view that legal structures, government policy, changing stakeholder expectations and a diverse business with complex accounting requirements were all reasons for the complex environment, and the real leverage was in finding ways to address complexity.

Following an overview of the issues the stakeholder group participated in a world café (Brown 2001, 2002; Brown and Isaacs 1996, 2001; Brown and Isaacs 2005) to explore options for solutions. The stakeholder group was asked to consider short term actions to address major concerns whilst the group model builders refined the causal loop diagram, provided opportunities for more input and complete and final loop diagram and identify major leverage points. The first cut causal loop diagram provided initial clarity of the issues and facilitated an agreed set of actions designed to build momentum as outlined in Table 2.

**Table 2 – Initial steps for a long term solution**

Finish the causal loop diagram of the “whole” system.	Establish and communicate role clarity.
Conduct training program to develop capacity to act.	Develop strategies for finance to be seen as and feel part of the wider organization.
Upgrade cashbook module.	Integrate stock and general ledger systems.
Loop diagram finance processes.	Develop business literacy so as to reduce delays outside of finance.

**Source: Authors**

Following the initial interviews and stakeholder group report back as part of the world café, each of the GMB team members began to develop their own representation of the data as causal loop diagrams. This was done for two reasons: the pragmatics of four mid-to-senior managers being off-line for an intensive period of time, and not wanting not come to a premature conclusion of what an ‘integrated’ causal loop diagram would look like. Each GMB team member developed individual causal loop diagrams.

There was however a strong requirement for “evidence-based modeling” and in the presentations, each model and representation was subjected to critical review, challenge, correction and iteration as a final diagram began to emerge. The need for evidence or data driven modeling whereby the causal relationships could be traced back to individual statements recorded in the interviews was felt essential for the eventual acceptance of the model by the participants.

Thus, while the models were built individually at an initial stage, they were created in a group process within the GMB team. Potential policy insights began to emerge because of group dynamics within the GMB team gatherings, not because of one expert modeler presenting a finalised model back to the GMB team. The skill of dialogue proved invaluable here for GMB team learning to occur which led to a more robust final version that could then be tested and validated back to the stakeholder group.

### **Making Sense of the Data**

During the concluding phases of developing a causal loop diagram, two insights emerged. The first came from those GMB team members attending the 22<sup>nd</sup> ISDC at Oxford in July 2004 when they drew upon the Forrester Award winning presentation (Wolstenholme 2004). In his acceptance speech, Wolstenholme presented his research findings on the importance of organizational boundaries as they apply to system archetypes to highlight the difference between what are intended and unintended consequences of individual actions. The boundary management problem (Wolstenholme 2004, p. 344) where flows across boundaries need to be managed appeared part of the analysis of this project.



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The second insight came as another GMB team member was attending the Systems Thinking in Action (STIA) Conference in Cambridge, Massachusetts in December 2004 where John Sterman and Bill Isaacs presented work on change efforts and the challenges associated with fire-fighting and tipping points. As part of this presentation a model on process improvement was presented drawing on the work of Repenning and Sterman (2001) in which the work harder, work smarter and shortcut balancing loops represented similar if not identical dynamics to those being experienced by the Monyx finance group.

Taken together, these offered archetypical reference modes, not in the traditional sense of reference mode as used in quantitative system dynamics simulation modeling, but as case study narratives that described very similar dynamics to what the participants in the finance, causal loop diagramming project had told to the GMB team.

### **Drawing the Loop diagrams for Organization-wide Learning**

In developing our finance loop diagrams as causal loop diagrams, we were confronted with what Espejo et al. (1996) termed “the Regulatory Models Dilemma”, which is that the more complex the models, the more difficult it is to share them and the less likely organizational learning will occur (Espejo et al. 1996, p. 187). In the language of cybernetics that Espejo et al. writes from, for managers who “control” an organizational function, the detailed complexity of the model necessary for “regulation” of a system means that those who develop the model are more than likely the only organizational members able to comprehend and understand the model. However, these complex models are difficult to use for communication and learning and thus the requirements for models used for “regulation” are different to those if the model is to be used for organizational learning (Espejo et al. 1996, p. 185).

The “final” causal loop diagram is shown as Appendix 2. This was an example of what the GMB team would categorize as a “regulatory” level causal loop diagram. As a GMB team, we were cognizant of the aforementioned “regulation-learning” dilemma. This is one of the great advantages of system archetypes (Wolstenholme 2004) namely to create simple models that are explicit. Without this simplicity of what is the far side of the organizational complexity, there can only be individual learning.

Organizational learning can occur when the causal loop diagram or model can be communicated in clear and unambiguous terms (Espejo et al. 1996). As representations, archetypical diagrams that are simple enough to be shared are not the detailed regulatory models themselves, but are “statements” about the interfaces between the relationships between stakeholders, sub-systems and local sections or sectors that enable learning (Espejo et al. 1996, p. 188). This appeared to be an example of the organizational (sub-system) boundaries management problem referred to by Wolstenholme (2004, p. 344).

In response to this finding, the GMB team produced a final model for learning which is reproduced at Appendix 3. While it is not a “classic” system dynamics causal loop diagram, complete with appropriate signage of the causality on causal arrows or identifying loop polarity, our purpose was for communication and learning.

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Additionally, while some in the target audience had prior exposure to causal loop diagrams at this time, many had not, so it was decided to “keep it simple and short”. Using PowerPoint build features, this loop diagram was built up in a series of steps as the GMB team “unpacked” the loop diagram incrementally and told a story based on interview and café responses. The simpler model was well received, specifically by our “naming” of certain problematic dynamics in loops.

One initiative the GMB team chose to follow was that of creating “quick wins”. This is not the same as quick fixes, with their associated unintended consequences and side effects. A quick win in this situation is akin to the importance in Kotter’s “eight stage process” of change (Kotter 1996) which he outlines the importance of generating short-term wins. Working as external consultants to the finance group, the GMB team was very cognizant of the importance of producing demonstrable results. This meant that people needed to see quick wins to build the confidence in the process that would potentially create long-term benefit. The ideas generated in the large group world café as outlined in table 2 provided the basis for actions that met the criteria for ‘quick wins’. As these actions were generated by the group it was felt that to implement as many of these at possible would develop confidence in the process and create a sense of momentum.

Leveraging from the finance loop diagrams as causal loop diagrams revealed several actions with short implementation times that could achieve some improvements, with none of the unintended consequences of a quick fix. This is an application of the concept of acting locally within a sub-system while thinking globally across the containing system.

### **Learning**

We were able to map in causal loop diagrams the feedback loop driven behaviours exhibited in part as a result of multiple locations across the finance function which were affecting the group dynamics within the finance sub-teams and between the finance function and their clients, the Monyx businesses. While the geographic location was raised as an issue, there were other dynamics revealed in our interviews.

There was another dominant pattern of explanation embedded in the stories which related to the complexity of the legal structures, the taxation implications of the formal structure and the compliance and governance responsibilities on the finance team and management. The solution suggested in these stories was to simplify the formal structure of the organization – and that this story had been being told for three years and if only the senior executives, leadership and Board of Management taken this advice, then the issues behind the review would not exist.

In parallel with the explanation of the complex legal structure, were the problems with the computerized accounting systems. The organization used multiple systems, some of which were quite old and, as legacy systems were difficult to maintain in part due to a lack of skill and expertise. The lack of a simpler and single accounting system further complicated the skilling and capacity of the finance people to perform their functions. Similar to the legal structures, the solution in these stories was to simplify the accounting systems by consolidating them into one new system and that had this advice been taken over the last three years, then this review would not have been required.

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The GMB team was not swayed by any one of these single categorizations. What most of the stories talked about was a physical, legal or technical solution to what appeared to be an out of control social problem around interpersonal relationships caused in part by an incremental deterioration of communication. Despite establishing a set of guiding principles and values that include the aspiration towards a learning organization and the importance of learning, a structured training program conducted during 2002 on dialogue, the purposeful design of our physical spaces to support conversation and interaction, and a cultural practice of valuing conversation, the communication breakdown emerged as the enduring theme. In complex human social systems such as modern organizations, the soft issues are the hard issues.

The GMB team reflected on the research and writings on undiscussables and organizational defensive practices (Argyris 2000) which deal with defensive routines established by people to protect themselves from the threat of embarrassment. What the GMB team noted was that in their one-on-one dealings with participants in our project, this was demonstrably lacking in their interactions. However, in their descriptions of the workplace dynamics both within the finance functions and between finance and its clients, genuine conversations were not occurring. We heard many examples of stories that appeared to the GMB team to be examples of the ladder of inference (Argyris 1993; 2000; Dick and Dalmau 1999) in that the application of attributions that were untested. What we heard were stories of behaviour that the GMB team was able to rephrase in their making sense phase as examples of escalating feedback dynamics resulting in the breakdowns of personal relationships and poor team dynamics.

### **‘General Laws of Systems Thinking’**

In making sense of the learnings of the processes, we were also looking for generalised learnings that could be applied in other situations in Monyx. There was a recurring “blame-no blame” tension during the interviews that we wanted to capture. As well, the system's history in terms of cause and effect are distant in time and place was a repeated theme in describing the finance system as complex. Both these elements are revealed in Laws of Systems Thinking in Chapter 4 of The Fifth Discipline (Senge 1990).

These set of eleven Laws of Systems Thinking are of course interrelated and it is hard to talk about one law without referring to another. However, two reoccurred most frequently and appeared to the GMB team as tightly coupled:

#### **Law 11 – There is no blame.**

Systems thinking tells us that there is no outside or “them” in looking for the cause of a problem, rather that the individual or “you” are a part of the cause of the problem and that you and the problem are interconnected as part of a system that we can define as the “problem situation”.

In this intervention, our systems thinking premise that we are all part of the system was that we should look to our own actions rather than others as the drivers of the problematic behaviour. In the final communication to all the finance team, this was a core message from the GMB team.

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**Law 7: Cause and effect are not closely related in time and space.**

We typically think of problems from the perspective of an isolated event. However, in organizations structured as complex networks of relationships that have evolved over time and the genesis of a problem occurs as issues deteriorate over time as each part builds actions based on higher and higher levels of untested assumptions and information.

This was again a focus of the debriefing and this law reinforced the no-blame stance of Law 11.

Additionally, in the final presentation, the GMB team drew on Law 6 – Faster is Slower – to loop diagram out a suggested improvement schedule. In addition to some quick wins to make some short-term improvements, several medium to longer-term improvements were simultaneously initiated. These longer-term improvements involved changes that would be implemented slowly over the coming period. It was this message given to both members of the finance function and the business units by the GMB team, with CEO endorsement as gatekeeper, sponsor and GMB team member, which allowed the finance team to move beyond the issues that lead to the intervention. From this perspective the intervention was seen as a success.

### **Organisational Responses**

As already outlined, several short term “quick win” initiatives were implemented. The longer-term “slower is faster” responses centred on restructuring the internal dynamics within the various finance functions, and between the finance functions and their clients. The purpose is not to outline in detail what changes Monyx implemented because of the GMB team study.

However, the premise of this paper remained ‘structure drives behaviour’ in the terms of organizational performance, thus the focus was on the interpersonal structural relationships. The levels of perspective model (Kim 2001) provided a useful framework for working with mental models and developing collective understanding of the relationship between vision, mental models, systemic structures and behaviours and outcomes. This model provided the background from which we identified actions including a re-focus on finance team communication skills, including team dynamics, team roles, personality types and preferences, as well as a revisiting and refreshing of communication and listening capabilities including dialogue training.

### **Insights into what is Organizational Learning**

Organizations exist as socially constructed realities in which the reality we know is interpreted, constructed, enacted and maintained through discourse (Ford 1999, p. 480). This view is supported by Berger and Luckman (1966) when suggesting that conversation creates and maintains our reality whilst Fonseca (2002) explores the link between conversation and social reality when discussing the view of Shotter (1993) that communication and language provide the vehicle of influencing thinking. The group model building process as outlined in this paper has drawn on this view of organizations and the challenges they face as being socially constructed by the participants.

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The concept of collective intentionality, which involves people forming shared beliefs, desires and intentions, is introduced by Searle (1995) when discussing the construction of social reality and it is this suggestion that organizations can reach shared objectives that underpins the approach taken in this group process that is the focus of this paper. By forming a shared view of the system, the problems involved and the actions to be taken the people involved in this process have been able to form a degree of collective intentionality and move in the desired direction. Constructivist validation is important for interpretive models as the idea is to provide new keys that might unlock new insights (Pidd 2003, p. 310) and the outcomes achieved have supported the social construction of the model that was developed.

Implicit in our organizations approach to organizational learning is organizations work the way they do because people work the way they do. And people work they way they do because of the way they think, and further, they work the way they do together because of how they think together. Therefore, if you want to change the way people work together, then you need to enable people to think differently - together. In the language of Argyris and Schon (1978; 1996), and Argyris (1999), we are enabling people to engage in “double-loop learning”, and in the language of Checkland (1985) to reflect on their framework of ideas; that is to change their mental models.

This study has shown how Group Model Building, when based within a conversational learning-based culture, has achieved organizational learning. The use of causal loop diagrams for learning has led to changes in behaviour and improvements in performance. We have demonstrated that a causal loop diagram is both a source of knowledge and a process for learning.

Like many similar studies, the real learning is in the process, rather than in the content or outcome. In addition, the deep learning exists in the premises that sit behind the process of the intervention.

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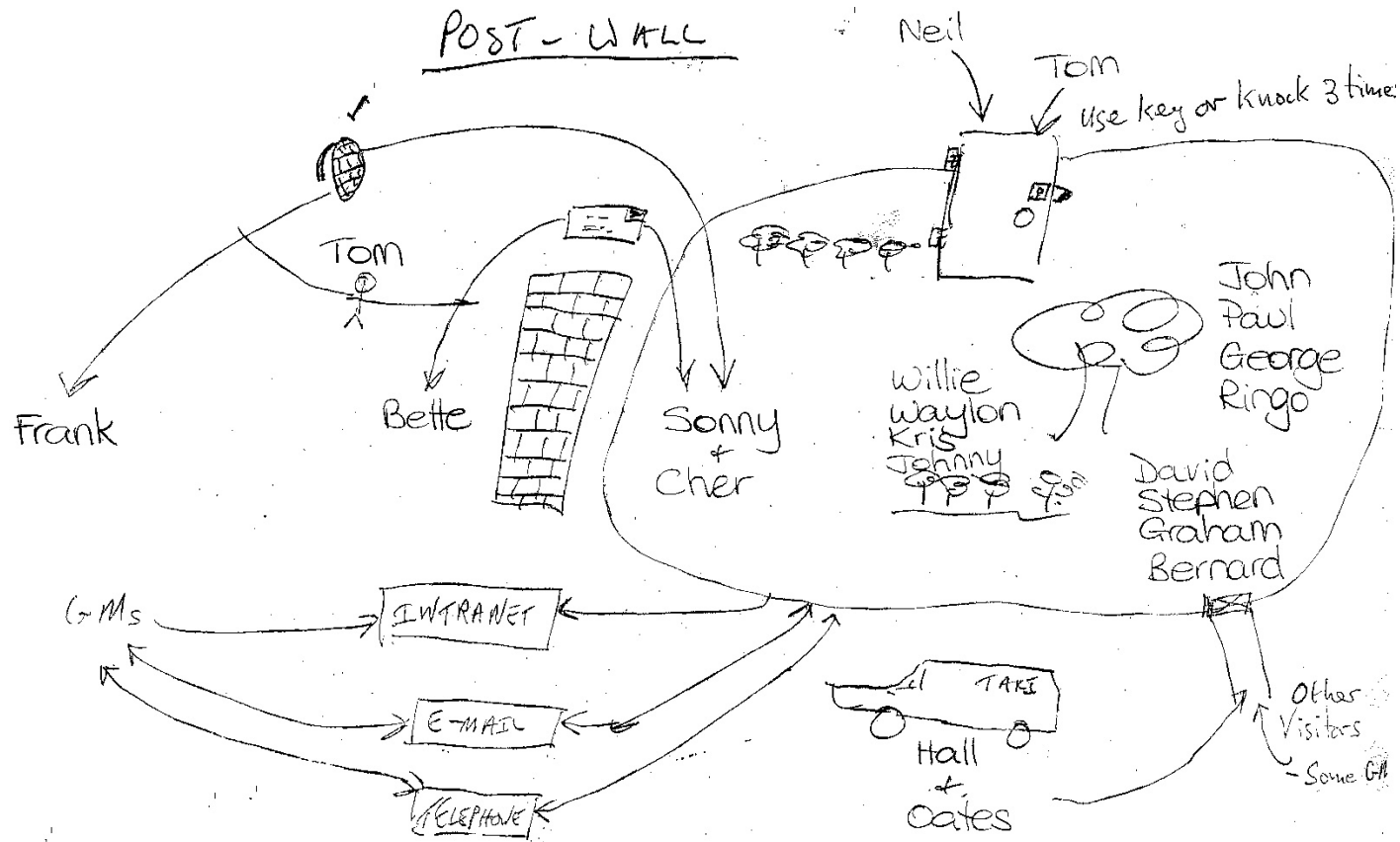
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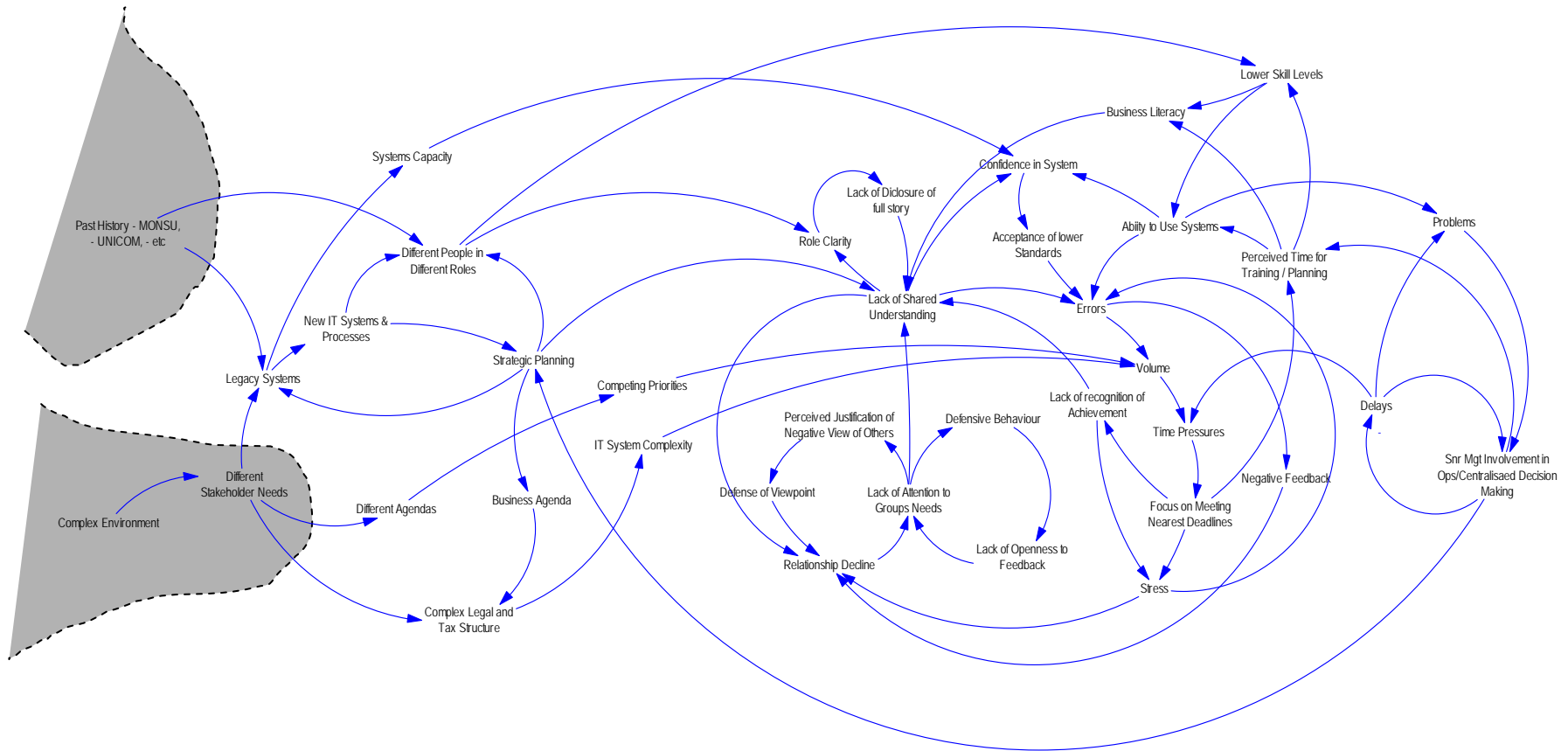
**Appendix 1:** Rich Picture Diagram representation of some of the 'systems' dynamics as told by one respondent.

Note: Names have been altered for anonymity





## Appendix 2: Detailed Loop diagram of the Finance System



**Appendix 3: Final Loop diagram of the Finance System used for Organizational Learning**

