

## **Abstract**

Recent research collaborations between the University of Technology Sydney and a number of NSW government agencies have “brought into focus difficulties that can arise when applying ‘standard’ project management practices in complex, multi-stakeholder environments, especially where organisational change is involved. Systems thinking has been found to offer a rich source of theoretical and model-based contributions to underpin successful implementation of strategic projects” (Costello, Crawford, Pollack and Bentley, 2002, p13). This paper discusses the application of hard and soft systems management towards planning and implementing strategic projects in the public sector. Reference is made to a case study of establishing the Centre for Affordable Housing, a new business initiative of the NSW Department of Housing.

## **Introduction**

The establishment of the Centre for Affordable Housing in July 2002 was a strategic initiative of the NSW Department of Housing. The Centre aims to promote affordable housing and broker new projects between the Department of Housing and the private, local government, and not-for-profit sectors. While initially the high level goals of this initiative were clear specific objectives and processes required resolution. The Dynamic Systems Management methodology was developed by the Centre International de Management et d’Analyse de Projets (CIMAP) to manage strategic projects that involve organisational change and new business systems. This methodology generated the detailed information to plan this complex initiative and inform a business plan that defined the Centre for Affordable Housing’s roles and key outcomes. Implementation of this business plan required staff and resources from across the organisation. Soft Systems Methodology tools were effective in engaging stakeholders to plan strategies to deliver these outcomes. Specific projects were identified that were executed and controlled using common project management tools. The combination of hard and soft systems management tools were essential to plan and implement this strategic initiative.

## Hard and Soft Systems Project Management

“Project management practice had its origin in systems analysis and systems engineering. Essentially systems analysis determines ‘what’ is to be done, which is often a strategic decision-making process, while systems engineering focuses on ‘how’ to do it, which is the realm of operational management” (Yeo, 1993, p 111- 112).

This system viewpoint is well suited to “hard” projects in which the goals and the methods of achieving them are well understood throughout the project (Turner and Cochrane, 1993, p94). Examples of such projects are found in the engineering, construction, and aerospace industries. Standard project management tools such as the Work Breakdown Structure and Milestone Plan can be effectively applied to plan and control these projects (Turner and Cochrane, 1993).

However, in practice this hard systems approach has proven “inadequate in dealing with soft, ill-structured problem situations in the real world, such as those encountered in the conceptual stage of project definition or those dealing with strategic planning issues when the definition of clear objectives and formulation of viable alternatives can be itself problematic” (Yeo, 1993, p114). In these “soft” projects neither the goals nor the methods of achieving them are well-defined (Turner and Cochrane, 1993, p 95). They are characterised by uncertainty, ambiguity and unpredictability. Examples of soft projects can be found in research and development initiatives and organisational change. The suggested project management strategy for soft projects is “innovative project initiation, to define the methods converting as quickly as possible, with a view to applying common project management techniques as a basis for management” (Costello, Crawford, Bentley, Pollack, 2002, p6).

Checkland’s Soft Systems Methodology (SSM) provides a framework for managing soft projects. In the SSM paradigm, ‘people are seen as individuals, each with their own culture, each continually developing and refining their own view of systems’ (Checkland, 1990, pA30.) “There is not usually one ‘best’ solution to a problem situation, but rather many different possibilities for action, each of which will be valued and judged differently by different stakeholders. Solutions thus arise through debate and the social construction of meaning” (Costello, Crawford, Bentley, Pollack, 2002 p7).

## **Strategic Projects**

A principal reason to use project management is to facilitate implementation of organisational strategy. These strategic initiatives invoke cultural change and typically involve resources from across functional areas. By their nature they are innovative and complex. They involve multiple stakeholders both internally and externally with diverse levels of experience, expectation and acceptance for the initiative. Project management provides a framework for planning and implementing strategic initiatives (Cleland, 1999).

Strategic planning establishes the mission, objectives, goals and strategies for where an organisation wants to go in the future. Strategic implementation is concerned with how the organisation is going to get there through the planned use of resources (Cleland and King, 1983).

The levels of planning within an organisation are:

- Integrative – definition of strategy in relation to the corporate objectives
- Strategic – key outcomes that are required to deliver the strategy
- Tactical – specific projects and activities to achieve the key outcomes.

Different project management approaches are appropriate at the different levels of project planning (Payne and Turner, 1999). This view of project planning can be interpreted as moving from the unknown to the known, or from “soft” to “hard”. In this context one can see the value in using a combination of hard and soft systems management approaches for strategic projects.

## **Soft Systems Research**

Recent research undertaken by the Project Management and Economics Program at the University of Technology Sydney (UTS) has focused on the exploration of project management theory and practice in NSW Government agencies. One research initiative involved a collaboration with the NSW Police Service to develop “a strategic approach for managing multiple, interdependent “soft” projects. The objective of the collaboration was to use systems theory as a conceptual framework for guiding application of project management practices to reform projects within the NSW Police Service” (Crawford, 1998, p11). “The research team and practitioners progressively developed a Soft Systems Project Management Approach (SSPMA) that effectively integrated aspects of

soft systems thinking with traditional project management approaches, tools and techniques” (Costello, Crawford, Pollack, Bentley, 2002, p10).

The learning gained from the UTS collaboration with the NSW Police Service was directly applied to support an organisational change program in the NSW Rural Fire Service (RFS). This program required transferring fire control staff from local government councils to the RFS within a 12-month timeframe without any interruption to core business. Informed by the SSPMA, a strategic framework for managing the process and engaging stakeholders was established by RFS staff supported by the UTS research team. The program teams were responsible for “unpacking” deliverables agreed during the strategic planning phase into project “work” packages. “SSPMA provided a collaborative approach in which the staff and community were able to participate as team members in solving complex organisational problems. The application of SSPMA was found to be equally valuable at integrative, strategic and tactical levels of managing the change process since it enabled the process of inquiry to form part of the complex whole” (Bentley, 2002, p14). The RFS reform program achieved its goal of effecting the transfer of local fire control staff by the target date. Its successful outcome was recognised in an award by the Australian Institute of Project Management (Bentley, Costello, and Crawford, 2002).

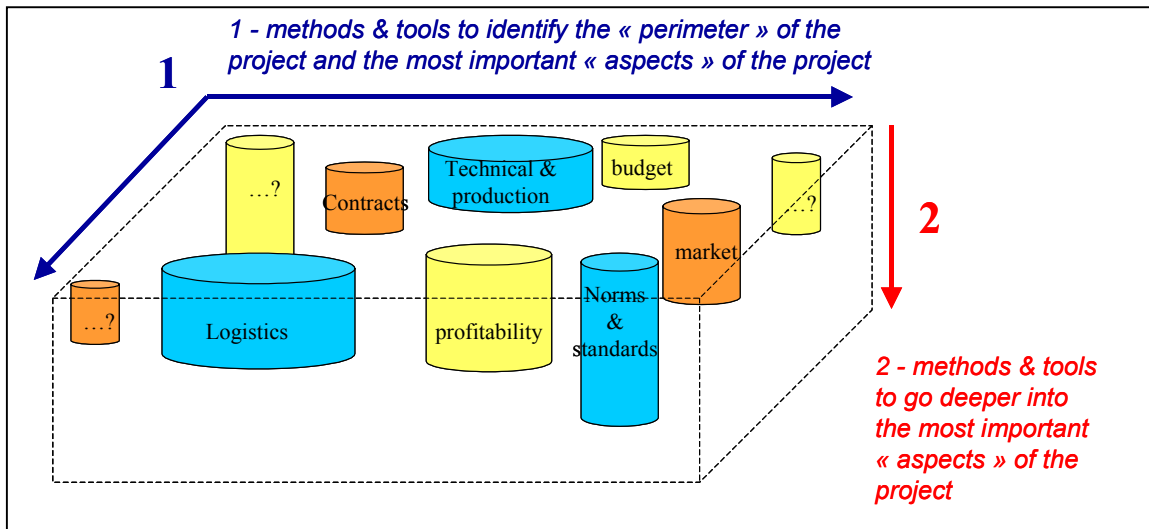
## **Hard Systems Research**

The Centre International de Management et d’Analyse de Projects (CIMAP), of ESC Lille France, has developed the “Dynamic Systems Management” methodology to manage complexity and chaos in organisations. This methodology is targeted towards “complex initiatives that involve new processes and business conditions” (Daniel and Lecubin, 2003, p5). It uses “hard” systems thinking as a means of analysing complexity to determine the information necessary to plan, implement and control the project.

The Dynamic Systems Management methodology is a multiple angle approach to:

- “Enlarge and Focus with methods and tools to identify the perimeter of the project and the most important aspects, and;
- Deepen with methods and tools to go deeper into the most important aspects of the project” (Daniel and Lecubin, 2003, p16).

Diagram 1: Dynamic Systems Management Multiple Angle Approach



(Daniel and Lecubin, 2003, p16)

Several For-Profit organisations (Philips Group, Guilbert Group, Crédit Agricole Group, Auchan Group, Aérospatiale, Boeing Company, THALES) and Governmental Organisations (Union des Caisses Nationales de Sécurité Sociale, ENA Dakar, Senegal, ILI Uganda, ILI/IDTI, Moroccan Government, World Bank Institute) have used the Dynamic Systems Management methodology to manage complex projects. These initiatives range from merger & acquisitions projects to infrastructure projects through to complex systems defence programs. These projects are extremely complex, involving multiple internal and external stakeholders, with many unknown factors and risks. However, to date the methodology has rarely been applied to public sector initiatives in Australia.

## **Case Study – The Centre for Affordable Housing**

The Centre for Affordable Housing is a new initiative of the NSW Government to develop a more coordinated and strategic approach to the promotion and development of affordable housing in NSW. Established on 1 July 2002, the Centre is a business unit of the NSW Department of Housing. The Centre aims to promote affordable housing and to broker new projects through partnerships between the Department of Housing and the private, local government, and not-for-profit sectors. It will undertake projects that can attract new partners, respond to market conditions, and deliver a product that responds to new demand. The Centre will streamline the delivery of viable affordable housing projects and will draw resources - land, capital and staff - from across the Department of Housing on a project specific basis.

The establishment of the Centre for Affordable Housing was a complex initiative that involved organisational change and new business systems. It was in this context that the project team applied a combination of “hard” and “soft” systems management tools to plan and implement this initiative.

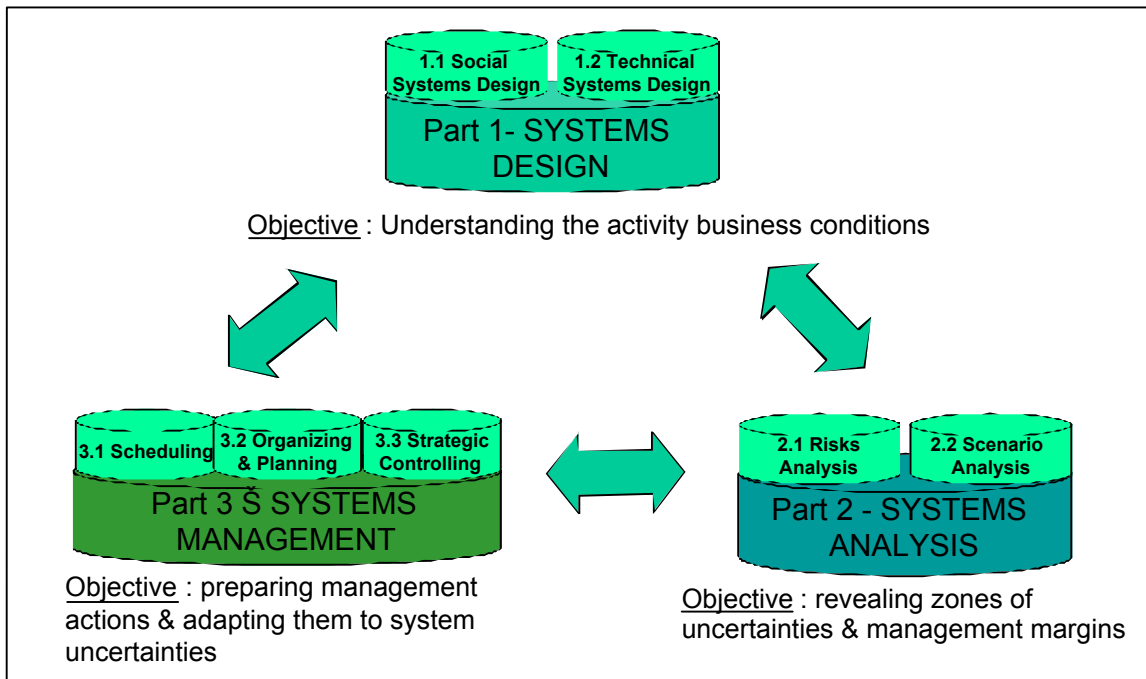
### **Planning**

The CIMAP Dynamic Systems Management methodology provided a systematic approach to understand and manage this complex project. By working through this methodology the project team defined the project parameters, designed a strategic framework, analysed dynamics and risks, and developed management strategies. In short the team moved from uncertainty to knowledge. This process produced the detailed information needed to plan the establishment and operation of the Centre.

The Dynamic Systems Management methodology involves three key phases:

- “Phase 1: Systems design – understanding the activity business conditions
- Phase 2: Systems analysis – revealing zones of uncertainty and management margins
- Phase 3: Systems management – preparing management actions and adapting them to system uncertainties” (Daniel and Lecubin, 2003, p20).

Diagram 2: CIMAP Dynamic Systems Management Methodology



(Daniel and Lecubin, 2003, p20)

### **Phase 1: System design**

Tool 1: Stakeholder constellation

This tool was used to map all stakeholders and categorise them into key groups.

Tool 2: Interactions matrix

This matrix established the perimeters of the project by identifying stakeholder influences on key project domains. The stakeholders' ability to influence the project both positively and negatively was defined as inputs, outputs, and variables. The matrix was populated through a brainstorming of all potential influences. Influences that would create major uncertainties or risks were highlighted for further analysis.

Tool 3: Checklists

This tool was used to analyse and understand key risks identified in the Interactions Matrix. This information was used to plan and control these risks. The uncertainties, risks and constraints were described, along with the key stakeholders. Strategies to

manage risks were defined. Change indicators to measure the level of risk were defined along with key moments in the project life cycle linked to the uncertainty.

**Tool 4: Logical Framework Analysis**

This tool was used to plan the strategic processes that are necessary to achieve the project goal. Based on the previous tools, the key inputs and outputs were identified to achieve the project objectives, which in turn will achieve the project goal. This tool provided the basis for work programming.

*Diagram 3: Logical Framework Analysis for Centre for Affordable Housing (excerpt)*

	ITEMS	NECESSARY CONDITIONS
GOAL#1	To promote and broker new affordable housing	
OBJECTIVES	1.1 Broker affordable housing projects	Agreements for affordable housing projects
	1.2 Build support for affordable housing	Positive response by partners, media and community
OUTPUTS (n)	1.1.1 Project feasibility studies	Professional services to undertake feasibility studies
	1.2.1 Promotional material	Effective distribution systems
INPUTS (n)	1.1.1.1 Project proposals	Partners with appropriate proposals
	1.1.1.2 Affordable housing assessment tools	Experts develop tools to facilitate affordable housing
	1.2.1.1 Case studies	Information on successful projects
	1.2.1.2 Resident profiles	Affordable housing residents
	1.2.1.3 Research on affordable housing	Experts undertake research

(Department of Housing, 2002)

**Phase Two: Systems Analysis**

**Tool 1: Technical risk assessment**

This tool was used to analyse the risk of key strategic processes identified in the Logical Framework Analysis. The technical risk of these strategic processes was assessed based on:

- External dependency – operational control for success
- Blockage – capacity to stop the project
- Innovation – capability to fulfil the process.

These were then plotted to identify critical strategic processes to be managed.

#### Tool 2: Social Risk Assessment

This tool was used to analyse the stakeholders' risks associated with their:

- Level of resistance and instability, and;
- Quality and control of interaction

These were then plotted to identify the critical stakeholders to be managed.

#### Tool 3: Ecosystem Dynamics Matrix

This tool was used to analyse the critical strategic processes, to understand what variables would affect them and how, and to develop actions for managing them. This involved identifying the initial conditions and parameters, or what absolutely had to happen to fulfil the strategic process. Key stakeholders and actions were identified to achieve these conditions, along with metrics to measure risk.

### ***Phase 3: Systems management***

#### Tool 1: Project Scorecard

This tool provided a summary of the key strategic processes to achieve the project objectives, prioritised based on the systems analysis. The Project Scorecard (shown in Diagram 4) was used to prioritise actions and manage risks.

#### Tool 2: Strategic Gantt Chart

Based on the Logical Framework Analysis, this tool was used to schedule the key strategic processes. This revealed the project phases, decision points (Go/No go), and critical paths.

#### Tool 3: Linkages Matrix

The linkages matrix identified formal linkages between the project team and stakeholders. It involved identifying the actions that have to be implemented to make the project a success.

Diagram 4: Project Scorecard for Centre for Affordable Housing (excerpt)

Stakeholder	Phase 1 – Establish the Centre for Affordable Housing	Phase 2 – Build partners' support and capacity to deliver affordable housing	Phase 3 – Broker partnerships to deliver affordable housing
Department of Housing	Business Plan for Centre	Affordable housing assessment tools	Feasibility study and development plan
Other State Government			AH opportunities through planning system
Private Sector		Partners' interest in joint venture affordable housing projects	Viable joint venture affordable housing proposals
Not-for-profit Sector		Partners' interest in joint venture affordable housing projects	Viable joint venture affordable housing proposals
Local Government		Local government support for affordable housing Capacity to identify and develop affordable housing opportunities	Viable joint venture affordable housing proposals AH opportunities through planning system
Community	Recognition of DOH affordable housing initiatives	Community support for affordable housing	
Other Government	Recognition of DOH affordable housing initiatives		

High Risk

Medium Risk

Low Risk

(Department of Housing, 2002)

### **Senior Management Engagement**

The Dynamic Systems Management methodology enabled the project team to analyse and gather the detailed information necessary to plan the project. Following this analysis the team sought input to the planning process from key senior management stakeholders within the organisation. The Dynamic Systems Management methodology was seen to be too detailed and complex for this stakeholder consultation. A “soft” systems approach was taken to:

- Engage stakeholders and understand their viewpoints
- Inform project definition and planning
- Determine purposeful action.

A workshop was held with senior management to develop the Centre for Affordable Housing Business Plan. Discussion was structured around the following questions.

- What needs to happen to achieve the aim of developing affordable housing through partnerships?  
 These were then grouped in relation to key functions.
- What outcomes need to be achieved in the first twelve months for each function?

- Who are the stakeholders for these outcomes and what are the necessary working relationships?

The outcomes from the workshop were captured in the Business Plan for the Centre for Affordable Housing. The Centre's roles and outcomes were defined in relation to the corporate key result areas to which they would contribute. These roles are:

- Facilitate and negotiate new affordable housing through partnerships
- Promote and market affordable housing
- Coordinate responses and resources to affordable housing proposals.

The roles and outcomes identified through the senior management workshop aligned with the objectives and key strategic processes identified through the Dynamic Systems Management methodology. This alignment confirmed the outcomes from this stage of project planning.

### **Work Program**

Based on the CIMAP methodology analysis and the Business Plan a work program for the Centre was established. A strategic work breakdown structure (shown in Diagram 5) defined the program of projects that was necessary to achieve the strategic objectives. This provided the basis for implementing the project.

*Diagram 5. Strategic Work Breakdown Structure*



(Department of Housing, 2002)

## Implementation

Implementation of the Centre's Business Plan involved staff from across the Department of Housing. These staff had a range of background, skills and project management experience. The Soft Systems Methodology provided a means for understanding these stakeholders and engaging them in planning and implementing the Centre's work.

Checkland and Holwell have developed a detailed seven stage Process for Organisational Meaning (POM) model. "Through the POM process the organisation can achieve:

- The context in which people create meanings and intentions, leading to;
- Purposeful action, supported by;
- Formally organised information systems" (Checkland and Holwell, 1998, p109).

The project team applied the POM model to one of the Centre's first projects, the development of a Communication Strategy. The project team included staff from the Centre, the Sponsor Executive Director's office, the Department of Housing Communications and Media Branch, and a consultant. At the outset, unclear roles and pressing deadlines created some confusion about how to proceed and individual's responsibilities in meeting objectives. The project team engaged in a 'rich picture' discussion of their goals, expectations and pressures for the project (Turner and Crawford, 2002). This established a broad common understanding and team dynamic. Following this, a workshop was used to define the key outcomes/work packages and the projects needed to deliver these outcomes (shown in Diagram 6). Once the objectives and methods of achieving them had been defined, traditional project management tools were used to execute and control these projects.

Upon reflection, it was relatively easy for team members to set aside or overcome their barriers once they had been expressed and acknowledged. Through the soft systems methodology process the members formed a common understanding and team dynamic. Multiple stakeholders with varying knowledge and objectives agreed on a project plan. They began to understand and apply project management tools to implement this plan. In short, the project moved from a "soft" state of uncertainty to be defined with "hard" tools that were used to plan and control the project.

Diagram 6. Communication Strategy Work Breakdown Structure



(Department of Housing, 2002)

## Project Status

Funding for the Centre for Affordable Housing was committed based on the Business Plan. The project team has pursued the outcomes identified in the Business Plan through a program of projects (see *Diagram 5. Strategic Work Breakdown Structure*). Soft Systems Methodology tools have been valuable in planning these programs, which involve resources from across the organisation. Stakeholders have collectively identified and planned specific projects to deliver these programs. Hard project management tools have been used to execute and control these projects. Diagram 7 identifies the range of hard and soft systems management tools that have been applied at every level to plan and implement the Centre for Affordable Housing.

*Diagram 7. Hard and Soft Systems Management Tools for the Centre for Affordable Housing*

	<b>Hard tools</b>	<b>Soft tools</b>	<b>Outcome</b>
<b>Integrative (Corporate)</b>	<ul style="list-style-type: none"> <li>• Dynamic Systems Management methodology</li> </ul>	<ul style="list-style-type: none"> <li>• Executive workshop</li> </ul>	<ul style="list-style-type: none"> <li>• Business Plan</li> </ul>
<b>Strategic (Program)</b>	<ul style="list-style-type: none"> <li>• Work Breakdown Structure</li> </ul>	<ul style="list-style-type: none"> <li>• Process of Organisational Meaning</li> <li>• Rich picture</li> </ul>	<ul style="list-style-type: none"> <li>• Program Plan</li> </ul>
<b>Tactical (Project)</b>	<ul style="list-style-type: none"> <li>• Project Brief</li> <li>• Gantt chart</li> <li>• Milestone Plan</li> </ul>	<ul style="list-style-type: none"> <li>• Brainstorming</li> <li>• Debate</li> </ul>	<ul style="list-style-type: none"> <li>• Project Plan</li> </ul>

(Payne and Turner, 1999; Pierre and Lecubin, 2003; Checkland and Howell, 1998; Turner and Cochrane, 1993; Turner and Crawford, 2002)

## **Lessons learned**

This case study provided the following lessons regarding strategic projects in the public sector:

- The CIMAP Dynamic Systems Management methodology generated the detailed information that was necessary to plan this complex project that involved organisational change and new business systems.
- The Dynamic Systems Management methodology requires support for the theoretical model, understanding of the analytical tools, and time to work through the analysis.
- Senior Management support is essential for strategic projects that involve organisational change for new business initiatives. A facilitated workshop was effective in engaging senior management in planning and endorsing the establishment of the Centre for Affordable Housing.

- This strategic project involved resources from across the organisation and staff with diverse ambitions and levels of experience. In this context, soft systems methodology tools provided an effective mechanism for understanding stakeholders and engaging in purposeful action to deliver project outcomes.
- A combination of hard and soft systems management tools was essential to the planning and implementation of this strategic project at all levels – integrative, strategic and tactical.

## Conclusion

To conclude, the CIMAP Dynamic Systems Management methodology proved to be an effective tool for planning the Centre for Affordable Housing. Soft systems methodology provided an essential complementary approach to engage stakeholders in purposeful action. As previous research has shown, the integration of soft systems thinking with traditional project management was beneficial at every level of this project.

The combination of these two methodologies – one essentially hard and the other soft - provided an effective approach to successfully plan and implement this project. Other strategic projects in the public sector that involve new business initiatives and organisational change would benefit from this integrated approach, provided it is supported and understood by senior management.

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