

Understanding Stakeholder Needs and Evaluating Performance in a National Research Organisation

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1. Introduction

We report on the development, integration and application of a range of evaluation tools with special reference to CSIRO's Division of Land and Water (CLW)³.

CSIRO is Australia's largest R&D organization and this year celebrates the 75th anniversary of its formation. CSIRO's job is to deliver innovative solutions for Australian industry, the environment and society. CSIRO is funded by a mix of Government and industry finance and has scientific expertise applicable to a wide range of industrial and environmental areas. Its research teams are managed in Divisions located around Australia and a number of overseas locations.

CSIRO today faces increasing demands from its stakeholders. There are increased pressures for accountability and efficiency, customer focus and delivery, and research partnerships. The Australian community wants an impartial, authoritative organization that it can trust. CSIRO management faces mounting staff issues of trust, job security and professional challenge.

CSIRO Chiefs (CEOs of the research Divisions) are accountable for the performance of their Divisions and research groups. Each Division delivers its science products into a range of Sectors of the economy and, in turn, each of these Sectors is serviced by a number of Divisions and other research providers with different expertise. CSIRO managers thus have a significant challenge in integrating their work across multiple Sectors and research groups.

2. Developing the evaluation framework

The evaluation challenge has been to develop an evaluation framework and tools that help managers and staff:

- understand stakeholder perceptions of performance;
- identify priorities for action;
- link the performance of research groups and Divisions with the research purposes they serve in various Sectors; and that
- are useful and useable for decision making and reporting; and
- result in more productive staff and 'delighted' external stakeholders.

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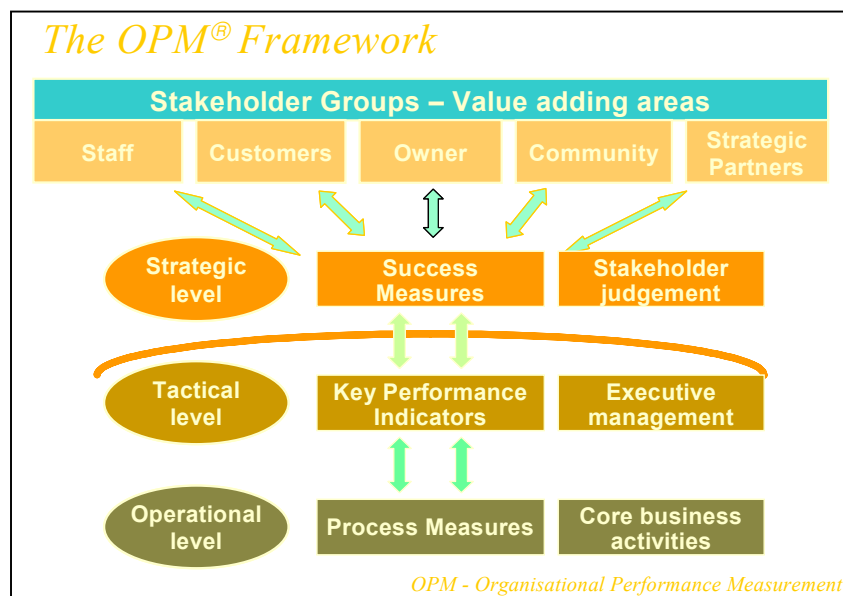
² Tim Yapp is Senior Adviser in CSIRO Strategic Planning and Evaluation

³ The tools and results we present have been developed in response to requests from a number of CSIRO Divisions. We would particularly like to acknowledge the assistance and patience of the Chief and Deputy Chief of CLW, Dr Graham Harris and Dr John Williams, and their senior managers and the members of the Land and Water Sector Advisory Committee.

The framework we have used focuses on understanding and meeting the expectations of the organisation's stakeholders. CSIRO's Division of Mathematics and Information Sciences (CMIS) has worked with a large number of small and medium sized enterprises as part of its industry quality improvement program and has developed a framework for Organisational Performance Measurement (OPM[®])⁴. OPM[®] has three driving principles: alignment, process thinking and practicality. It focuses on three levels of management and measurement.

At the **strategic** level of an organisation there are processes for setting strategic directions, objectives and targets. At this strategic level the effectiveness of the enterprise is reflected by **Success Measures** which are largely stakeholder perceptions of performance as compared with other enterprises. At the **tactical** level there are processes for aligning the organisation's resources with its strategic objectives. At this tactical level management effectiveness is measured by organisation-wide **Key Performance Indicators (KPIs)**. As a 'bridge' between success measures and KPIs it is useful to identify a set of **Critical Success Factors (CSFs)** – those things that the organisation must do exceptionally well in order to be judged successful and on which progress is monitored by the KPIs. At the **operational** level lie processes for creating and delivering products and services. The operational effectiveness of an organisation is measured by a range of **Process Measures**. The OPM[®] framework is shown in Figure 1.

Figure 1



Comparative Value Analysis (CoVA) is a powerful measurement tool that complements the OPM framework. It is a tool that enables organisations to understand the major drivers of stakeholder satisfaction and to track their performance on key value-determining attributes relative to alternative providers. Figure 2 - a 'generic' customer

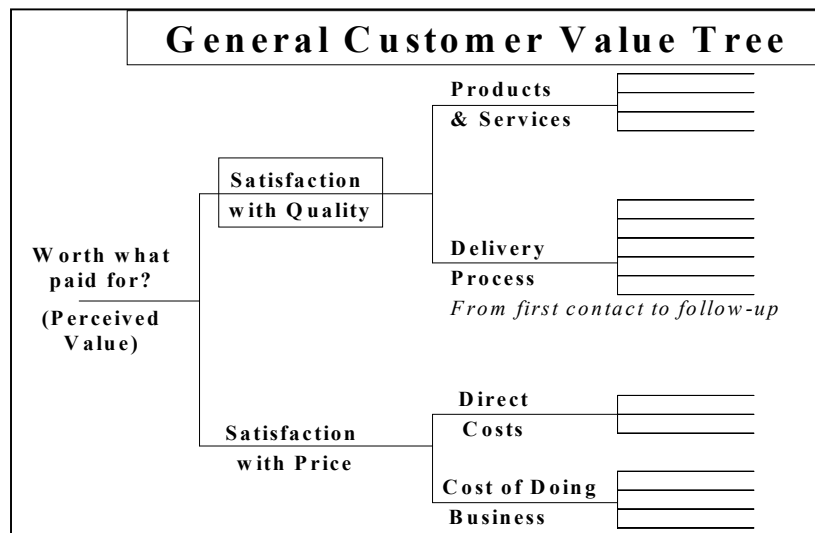
⁴ An overview of OPM[®] is provided in A.F. Chennell, S.B. Dransfield, J.B. Field, N.I. Fisher, I.W. Saunders and D.E. Shaw; "OPM[®]: A system for organisational performance measurement". Paper presented at the Second International Conference on Performance Measurement, University of Cambridge, 19-21 July 2000, 96-103

value tree - illustrates the general principle that value is determined by the customers' perception of the organization's performance on a specific set of 'quality' and 'price' attributes.

3. Stakeholder Analysis.

CSIRO has an external advisory body for each of the Sectors it services. Developing an evaluation framework for CSIRO Land and Water started with asking the Land and Water Sector Advisory Committee (LWSAC) what questions they would address in assessing CSIRO's performance in the Sector. The information needed to answer these questions should sensibly be derived in part from the information used to judge the performance of research groups and Divisions. Thus, the basic information is collected at the research group level and aggregated where possible to the Divisional and Sectors levels. Some of the evaluation information can only be assessed at the higher levels.

Figure 2.



Implementing the OPM[®] starts with analysing the stakeholder expectations by developing values trees in each of the value-adding areas. We worked with the LWSAC to develop a generic customer value tree to determine the main drivers of satisfaction of products and services, the delivery process, direct costs and the cost of doing business. We then asked the individual members of the LWSAC and a focus group of key external stakeholders to assess CSIRO's performance. Although the results need to be qualified due to the small sample size, the response has given us an insight into the important expectations of our stakeholders. These were:

- Intimate understanding of customer context
- Scientifically robust, credible and original
- Identify the right problems and focus scientific effort
- Be objective and reliable
- Culture providing leadership on national issues
- Packaging an integrated team effort and providing integrated solutions to customers
- Provide understanding behind the answers

- Be professional and ethical
- Meet user requirements in the way results are delivered
- Have a long-term relationship with customers
- Have transparent costing, low transaction costs and invisible internal processes.

In addition, there is an expectation by staff that CSIRO will provide them with challenging and rewarding careers.

The stakeholders' perception is that CSIRO has a strong scientific base but needs to improve in important parts of the delivery process.

4. Research Portfolio Assessment

Cooper et al⁵ describe the portfolio decision process as characterized by uncertain and changing information, dynamic opportunities, multiple goals and strategic considerations, interdependence among projects, and multiple decision-makers and locations. They identified goals for project management as having the right number of projects; avoiding pipeline gridlock; having solid commercial prospects; a balanced portfolio – long term vs short term, high risk vs low risk, across markets and technologies; having projects aligned with business strategy; and spending breakdown that mirrors the business's strategy and strategic priorities. For CSIRO we translate these to considerations of having a consistent flow of product onto the market and a dependable cash flow; consistency of fit with strategic intent; having the appropriate research capability; and issues to do with project management. The tool⁶ we have developed for assessing the balance of the Division's research portfolio, evaluates projects against a number of criteria and sub-criteria that are consistent with the general Return to Australia priority framework developed by CSIRO⁷. These are:

- **Strategic fit**
Consistency with strategic directions
Contribution to other projects
CSIRO role
- **Potential benefits**
Extent of economic impact
Extent of environmental impact
Extent of policy impact
- **Ability to capture benefits**
Uptake events and directness of impact pathway
Impediments/incentives to uptake
Capacity to use/adapt and 'deliver
- **R&D potential**
Time to produce research outputs
Type and complexity of research
Fertility of relevant fields of research

⁵Robert G Cooper, Scott J Edgett, Elko J Kleinschmidt. "New Product Portfolio Management", *Journal of Product Innovation Management*. Vol 16 (4), 1999

⁶We also acknowledge earlier work and contributions by Shaun Coffey, now Chief of CSIRO Livestock Industries, and Dr Michael Spilsbury at the Centre for International Forestry Research.

⁷The CSIRO Strategic Plan 2000-2001 to 2002-2003 outlines this framework and its use in more detail.

- **R&D capacity**
 - Financial feasibility
 - Quality and breadth of skills; ‘Critical mass’ of effort
 - Quality of infrastructure and support
 - Climate for creativity and innovation

The Research Portfolio Assessment tool entails the assessment of projects or research groups against four indicator statements linked to points 1, 4, 7 and 10 on a rating scale. The Chief and Deputy Chief in CLW initially used the tool to assess the balance of the Division’s research portfolio. It was also used by component leaders to evaluate the balance of research across CSIRO in the Land and Water Sector.

Given the quantum of resources allocated to each project or research group and the rating against each criteria, a spreadsheet is used to generate a range of bubble diagrams. Research managers need to take account of a wide range of issues when assigning resources to projects or research groups. The portfolio assessment tool facilitates systematic consideration of these issues. Presentation in a visual format quickly highlights where more detailed analysis or re-balancing of effort may be needed. A range of assessment screens may be generated to suit the circumstances of the particular user. In the CLW context, we found the following to be of interest:

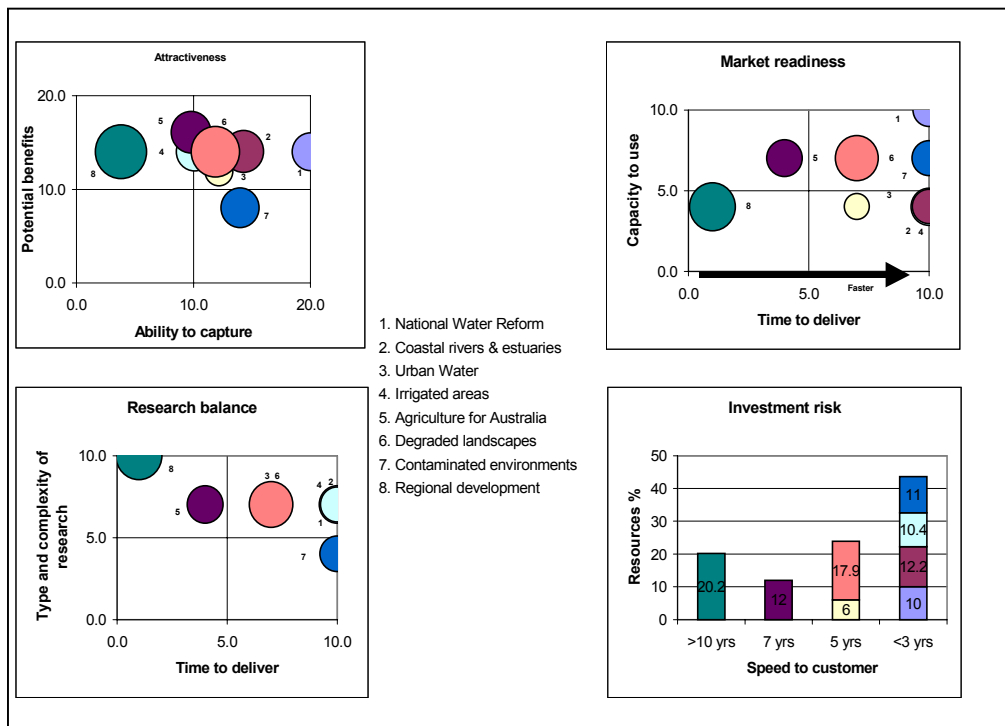
Resource alignment:	Resources % vs total score
Attractiveness:	Potential benefits vs ability to capture benefits
Feasibility:	R&D potential vs R&D capacity
Strategic alignment:	Potential benefits vs R&D capacity
Strategic risk:	Ability to capture benefits vs R&D capacity
Organisation alignment:	Strategic fit vs R&D capacity
Organisation role:	Strategic fit vs potential benefit
Skills alignment:	Strategic fit vs quality and breadth of skills
Research balance:	Type and complexity of research vs time to deliver
Market readiness:	Capacity to use vs time to deliver
Investment risk:	Financial feasibility vs time to deliver
	Financial feasibility vs type/complexity of research
	Resources % vs time to deliver
	Resources % vs type and complexity of research

Examples of the screens generated are shown in Figure 3.

5. Research Group Evaluation

Performance assessment of a research organization is critically dependant on the performance of its research groups. The assessment tool described here is designed to be compatible with accountability and reporting requirements at higher levels. That is, the research group evaluation tool informs both the research portfolio tool and various accountability requirements. The evaluation criteria used for assessing the performance of research teams are:

Figure 3



- **Strategic fit**
 - Positioning / Agenda
 - Interaction with other groups
 - Group role
- **Market knowledge**
 - Nature and extent of issues being addressed
 - Knowledge of customers
- **Capability**
 - Scientific quality
 - Team performance
 - Financial performance and status
 - Infrastructure, including systems and processes
- **Evidence of progress**
 - Stakeholder relationships
 - Scientific output
 - Commercialisation and delivery of outputs
 - Uptake and use of outputs
 - Wider impacts
 - Enhancement of capability

The assessment scale used is:

- Unacceptable performance
- Inconsistent performance - key areas need improving
- Generally satisfactory - some areas need improving
- Good performance - all objectives being met
- Outstanding performance - expectations and objectives exceeded

This approach to performance evaluation has been tried so far by CSIRO Molecular Science. We expect that improvements and adaptation will occur with further use.

6. Impact Assessment

To gain an initial appreciation of the impact of selected R&D projects on government policy, a joint CSIRO/AFFA⁸ team undertook an exploratory case study of a small number of projects in CSIRO Land and Water. Team members interviewed the project leaders and a small sample of AFFA policy managers and the intermediary commissioning agents. Preliminary conclusions were tested with an AFFA focus group, followed by a team workshop as a final validity check. It was concluded that the main factors affecting the utilisation of science for policy were:

1. Understanding the policy context
2. Formal and informal linkages between organizations
3. Level of community/political awareness
4. Multi-disciplinary / multi-organisation perspective
5. Trust and credibility and absence of personal bias
6. Usability of information
7. Active involvement in formulation of research agenda
8. Extent of disruption to existing practices
9. Continuity of staff, knowledge and organisations
10. Level of awareness and understanding of scientific information

The overwhelming message is that the two organisations need to work at making the direct and indirect linkages between them more effective – it will not happen overnight nor will it be easy. Both parties need to appreciate the value of regular interchange. Although this was a quick trial of a method to obtain data to assist with designing R&D for policy relevance, we also hoped to test the usefulness of the methodology as an evaluation tool for assessing impact on policy. Subsequent experience showed that this procedure did provide efficient access to the factors that had made scientific projects influential in policy.

7. Other evaluations

CLW has conducted a lot of other evaluation-oriented activity in its drive to improve relevance, efficiency and effectiveness. These include: process mapping; a Catchment Science Review; work sampling; BLOSS Career Path Analysis; staff surveys; and employer of choice focus group analysis.

8. Conclusions

Analysis of the results of the suite of evaluation activity in CLW has enabled the Division to articulate its **Critical Success Factors (CSFs)** as:

- Strategic intent that differentiates and positions the Division
- A project portfolio that focuses effort

⁸ Commonwealth Department of Agriculture Fisheries and Forestry

- Develop productive long-term relationships
- Manage processes for recruiting, developing and rewarding staff
- Manage resources and infrastructure to achieve targeted performance
- Innovative, high class science that is problem-focused that creates value for customers
- Team formation that enhances adaptability, flexibility, responsiveness
- Project management skills
- New and improved processes
- Communication practices
- Strategic relationships with other Divisions

Indicators will now be developed to assess progress in achieving these Critical Success Factors. Those indicators will be the tactical level Key Performance Indicators in used OPM[®] to assess the management effectiveness of the Division.

Finally, the experience that introducing new evaluation practices during times of rapid organizational change is a slow and difficult process is hardly news. For example, CSIRO now has a new Chief Executive who has initiated a Strategic Action Plan to re-orient the organization. None-the-less, the process of developing and using the evaluation tools has been useful in highlighting key issues for CLW managers and will help guide the implementation of a revised strategic intent for the Division. Over time, application and refinement of these evaluation practices will also help managers with the implementation of change congruent with their strategic intent. Although there is a long way to go in institutionalising the evaluation framework, the start is promising.