

The Dynamics of Organisational Performance Development of a Dynamic Balanced Scorecard

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Abstract: *Performance indicators are key feedback drivers of organisation dynamics. However, the extensive evaluation literature gives no scientific basis for the selection or testing of the opportunities of such indicators. This paper discusses the development of a “dynamic balanced scorecard” for a federal government department. The balanced scorecard suffers from the limitation of all performance indicator systems, namely that the interrelationships, and especially delayed feedback, between indicators are overlooked. Therefore it is essential to take such feedback into account. System dynamics is an appropriate methodology to achieve this. The paper outlines the modelling of causal interactions between organisational responses to work overload, staff morale and productivity, rework and output quality. The component sub-models and management implications of the dynamic BSC are discussed.*

Keywords: system dynamics; balanced scorecard; performance indicators

PROBLEMS WITH CORPORATE PERFORMANCE INDICATORS

Performance indicators are central instruments for managing organisations. A fundamental purpose of performance indicators is to give decision makers feedback on program operations in order to guide future decisions. However, in order to be confident regarding decisions made consequent on such feedback, two key conditions must be satisfied:

- the indicators chosen must be, in some sense, the ‘right’ indicators (i.e., we need some rational basis or criteria, in addition to consensus or availability, for selecting indicators); and
- there should be a way of testing decision rules for reacting to movement in these decision criteria.

A review of 700 performance management documents in the Defence Managers’ Toolbox (Department of Defence, 1999) failed to find a single reference regarding criteria for selecting indicators. They were similarly silent on the issue of developing ‘decision rules’ for guiding action consequent on indicator changes.

The wider literature on evaluation and program budgeting is similarly unhelpful in moving beyond the vague platitudes. One of the seminal documents in prompting governments to move towards program management was the 1965 *Manual for Programme and Performance Budgeting* produced by the United Nations. Despite a wealth of information on the possible uses of performance indicators, its only contribution to the process of defining them was the statement “*Such measures can be developed and refined after steps have been taken towards ... the establishment of suitable programme classifications ...*” (UNO, 1965).

Contributors to successive Australasian Evaluation Society conferences have also ignored these issues. Some provide shopping lists of plausibly relevant indicators, but give only qualitative guidelines for indicator selection. Others give a valid critique of the approaches to performance indicators in the Australian public sector, questioning in particular who gives guidance on the indicators, what the indicators actually measure and whether valid measurements can be made. But yet again there is silence on how to do better.

Neither Australian nor international evaluation literature give credible guidance on criteria for selection or design of performance indicators and are silent on the issue of assigning decision rules for action consequent on ‘indications’. This failure was the catalyst for the system dynamics research at the Australian Defence Force Academy into the development of the ‘dynamic balanced scorecard’.

System Dynamics and Performance Indicators

An implicit assumption behind Australian public sector approaches to selecting performance indicators is that the feedback they give to the decision maker (either directly or via resultant pressure or direction from others) will ‘cause’ the decision maker to make *appropriate* adjustments to the inputs or processes. However, there is abundant research in the field of system dynamics (Sterman, 1989), as well as in the fields of experimental economics and psychology which suggest that managers have great difficulty managing dynamically complex tasks. Sterman argues from his work at MIT that there is “systematic misperception of feedback” especially when there are delays in the system. Mosekilde, Larsen and Sterman (Mosekilde & Sterman, 1989) present the

results of 48 simulations of the “Beer Game” run with 192 graduate students from MIT and senior executives. The results show that their decision-making on the basis of straight forward performance indicators, but in the face of delays, resulted on average in costs more than 10 times the optimum! Simulations run at the Australian Defence Force Academy with graduate students and Defence executives have shown similar results.

In other experiments, where graduate students had full information, training and opportunities for gaining experience, Diehl and Sterman still found poor managerial performance in the face of variations in feedback strength and delay (Deihl, 1994). Diehl and Sterman argue that the mental constructs and heuristics that managers bring to bear on complex tasks are fundamentally dynamically deficient. *“Subjects were unable to account well for delays and feedback effects because (1) people’s mental representations of complex tasks are highly simplified, tending to exclude side effects, feedback processes, delays, and other elements of dynamic complexity; and (2) even when these elements are known, people’s ability to infer correctly the behaviour of even simple feedback systems is poor.”*

The first deficiency can certainly be addressed through training. The second, however, *“... is a fundamental bound on human rationality - our cognitive capabilities do not include the ability to solve systems of high-order non-linear differential equations intuitively.”*

The implications of such findings is that decision support tools which can address such dynamics are essential for managing complex environments. It is in this context that the ‘Balanced Scorecard’ (BSC) performance framework, proposed in 1992 by Kaplan and Norton (Kaplan & Norton, 1992), has great significance.

Towards the Balanced Scorecard and a more systemic approach

The BSC (Figure 1) is an outcomes oriented performance management system that seeks to link the short and long term activities of an organization with the vision, mission, and strategy of the organization through the establishment of measurable, consensus-driven goals.

The BSC has a number of key characteristics:

- It is focused on strategic management;
- It incorporates indicators relating to a number of sectors (in the ‘classic’ version, Customer, Financial, Internal Business Processes and Learning & Growth);
- It incorporates both ‘lead’ and ‘lag’ indicators; and
- The indicators allow ‘drill-down’ to understand the ‘cause-and-effect’ chain in the system

Kaplan and Norton explicitly recognised the systemic inter-relationship (Kaplan & Norton, 1996) within and between the various sectors, incorporating both lead and lag indicators, which impact on organisational performance. In addition, they explicitly argue for the development of decision support software which will enable managers to test the implications of decisions on the system. Unfortunately, Kaplan and Norton’s emphasis on ‘cause and effect’, where acknowledged, is often expressed in a uni-directional ‘cause and effect chain’ based simply on tracing the data trees ultimately feeding the indicators. We are not aware of any implementations which recognise the diverse interactions, and especially delayed feedback, between key decisions and performance indicators.

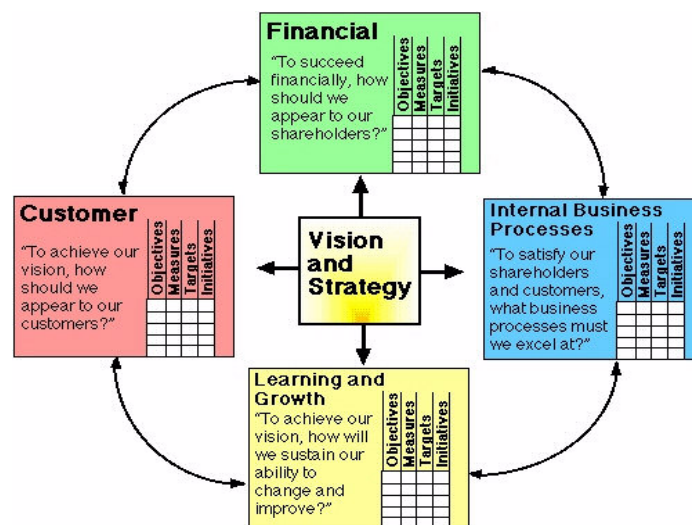


Figure 1: Balanced Scorecard (Kaplan and Norton)

TOWARDS A DYNAMIC BALANCED SCORECARD FOR THE PUBLIC SECTOR

Our research attempts to implement the Kaplan and Norton ‘ideal’ BSC. Working with a number of government agencies we are prototyping a “dynamic balanced scorecard” (in essence, a ‘management flight simulator’) which will sit on top of an agency’s performance management system and enable managers to test ‘what if’ scenarios. The aim is to provide a test bed for evaluating both performance criteria and the decision rules appropriate to those criteria, and thereby provide a basis for true ‘forward looking’ management.

Characteristics of a Public Sector BSC

The primary function of the Australian Federal Public Sector is to provide a range of services to the Government through the responsible Minister. Departments have legal requirements which set up ‘customer relationships’ to the Auditor General and to the Parliament in respect of ‘governance’. Where Departments provide services direct to the public, they are required to prepare and implement a service charter, providing a clear ‘customer relationship’. Thus there are three ‘Customers’ who may need to be addressed in a BSC:

- for most departmental activities, the Minister, and through him/her, the Government;
- in respect of governance, the Auditor General and Parliament, as well as the Minister;
- for service delivery activities, the corporate or individual service recipients.

The prototype dynamic BSC focuses specifically on the relationship between managerial responses to any ‘workload- resourcing’ gap (the ‘Capacity Gap’), and how this impacts on the first two ‘Customers’ above. The model outputs relate to an output quality index; probability of fraud / probity incidents; and probability of EEO incidents. The following causal loop diagrams illustrate the mechanisms by which these are impacted by departmental operations. The interrelationships between the respective work area outputs and their impact on achievement of outcome indicators is subject of a separate study.

(a) Interrelationships Within the Resources Sector

Figure 2 illustrates interrelationships in the resources sector. ‘Customer Demand’ represents the Government’s (through the Minister) expectations and determines the resourcing level. It is almost axiomatic that available resources will be less than that required for quality implementation of all the planned workload, let alone the inevitable unplanned demands. The quality of management also impacts through errors in workload planning (e.g. due to inexperience or poor negotiating skills). Whether the management response to any ‘capacity gap’ is innovative or dysfunctional is a function of the organisational competencies, which in turn are the result of leadership and investment in capability, the latter balancing short term impacts on recurrent resources.

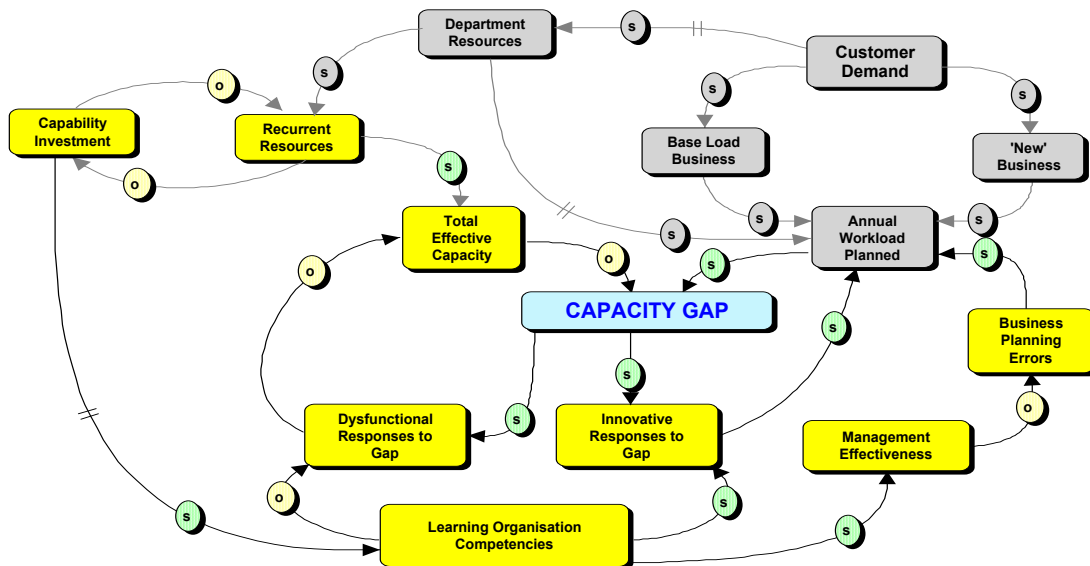


Figure 2: Key Resource Sector Interdependencies

(b) Interrelationships Underpinning ‘Excellence’ in Internal Processes

The “Internal Processes and Procedures” sector in public sector organisations is complex. Very high staff turnover over the past decade (typically average 18 to 24 % per annum in key policy areas) suggests that people and workload management is an underlying process that what “we must excel at”.

Whilst Government establishes the policy and program outcomes to be achieved in exchange for the financial resources, management translates the vision and allocates the capabilities to achieve the agreed outputs. The resource management framework thus provides a backdrop for an integrated planning process that links corporate plans, business plans and individual plans.

Once the budget framework is set, Federal Departmental managers have limited scope for obtaining extra resources. Any increase in workload, and any workload underestimate, typically will be addressed through:

- more intense and longer hours of work (unpaid overtime)
- reduction in time devoted to training and development
- reduction in strategic management activities (through redirection of 'management time' to 'task time')
- deferring some work (which simply postpones the day of reckoning) and
- reduction in target quality of inputs (e.g. through cutting background research effort) or outputs

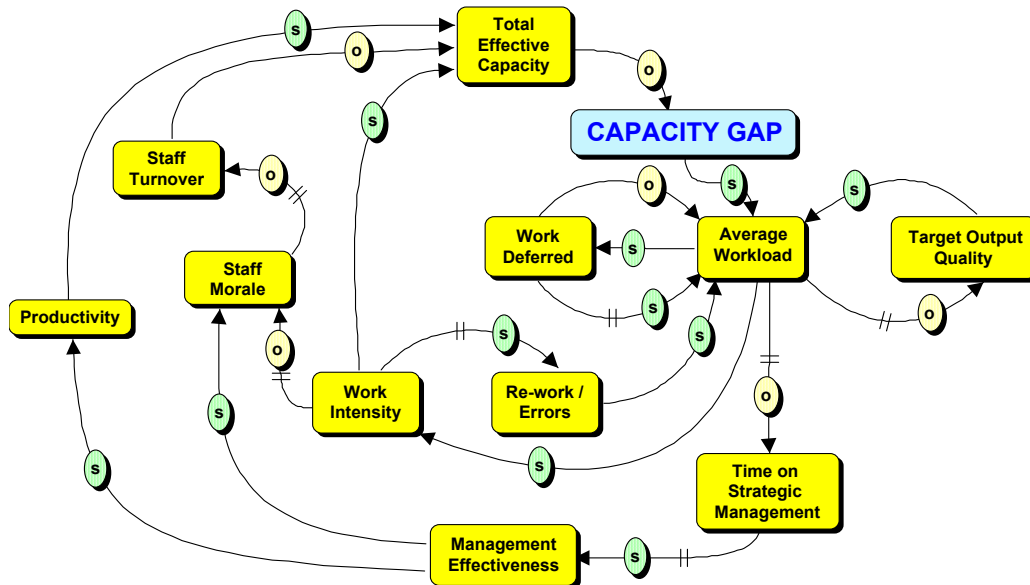


Figure 3: Key Interrelationships Impacting on Internal Processes

As illustrated in Figure 3, if such management responses are prolonged, they tend to produce dysfunctional feedback effects which eventually increase the capacity gap, through increased re-work, falling moral, increased staff turnover.

Where there is excellence in leadership and a culture characterised by the 'learning organisation' one could expect innovative responses to any significant or prolonged 'capacity gap'. In essence such innovation changes the 'rules of the game' to achieves the desired result. Whilst there are local examples of such behaviour across the bureaucracy, the authors would be sparing in their application of 'learning organisation' to Departments as a whole. Only dysfunctional responses have been incorporated in to the model at this stage because of lack of data to permit modelling of the 'learning organisation' response.

(c) Interrelationships in the Learning & Growth Sector

Recruitment standards to the Federal Public Service are high. Almost 50% of all recruits have a Bachelor Degree or higher. Staff receive support to upgrade qualifications. Middle & senior management training in principle has a high priority, but takes second place to meeting targets. Work pressure on all staff, and unpaid overtime, has increased significantly over the past 15 years, which is an impediment to self-development. In the face of work pressures, informal and formal staff development tend to be among the first areas to be constrained. Figure 4 shows the key causal relationships impacting on the learning and growth sector.

The very high staff turnover across many Departments is indicative of problems in the learning and growth sector. The Federal Finance Ministry is the most striking, where the average turnover at the executive levels has been 25% to 30% per annum, and 20% per annum across all staff. The Department has quite evidently lost the reputation for excellence it had in the 1980's.

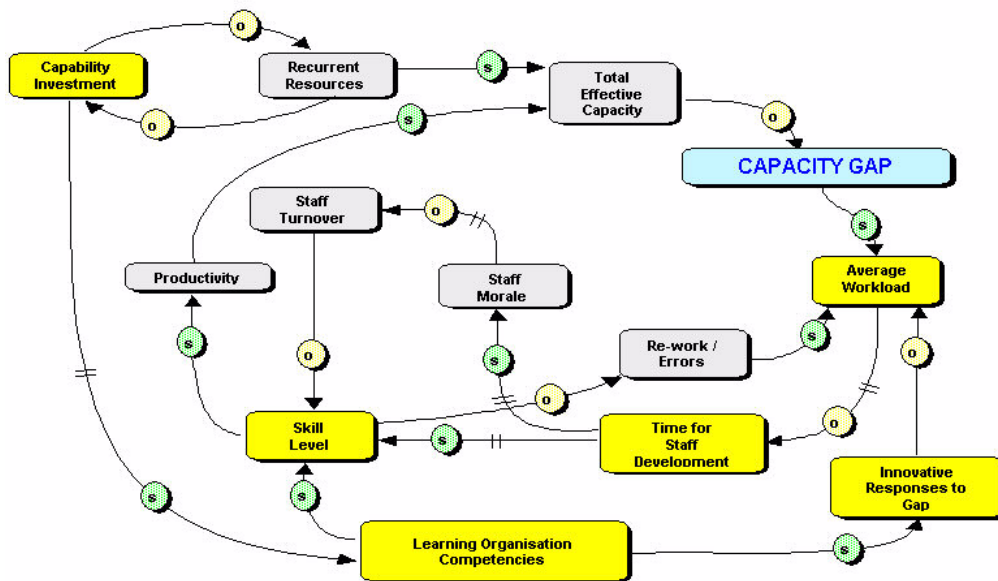


Figure 4: Key Interrelationships Impacting on Learning & Growth

Corporate Governance & Corporate Health

We have been undecided whether corporate governance and corporate health should be regarded as sectors in their own right. On the one hand, Corporate Governance might be viewed as a key indicator in the Customer Sector, whilst Corporate Health might be an indicator for the Internal Process Sector. On the other hand, failures in these areas tend to have major political implications for the Minister and the Government as well as significant feedback interrelationships with the other sectors. In the current model implementation, they are presented as distinct sectors.

The Australian National Audit Office (ANAO) defines corporate governance to encompass authority, accountability, stewardship, leadership, direction and control (ANAO, 1997). The dynamic BSC model, at this stage, uses fraud events as a general surrogate for the effectiveness of governance across the broad range of departmental activities. The structure of the Corporate Health Sector sub model is similar.

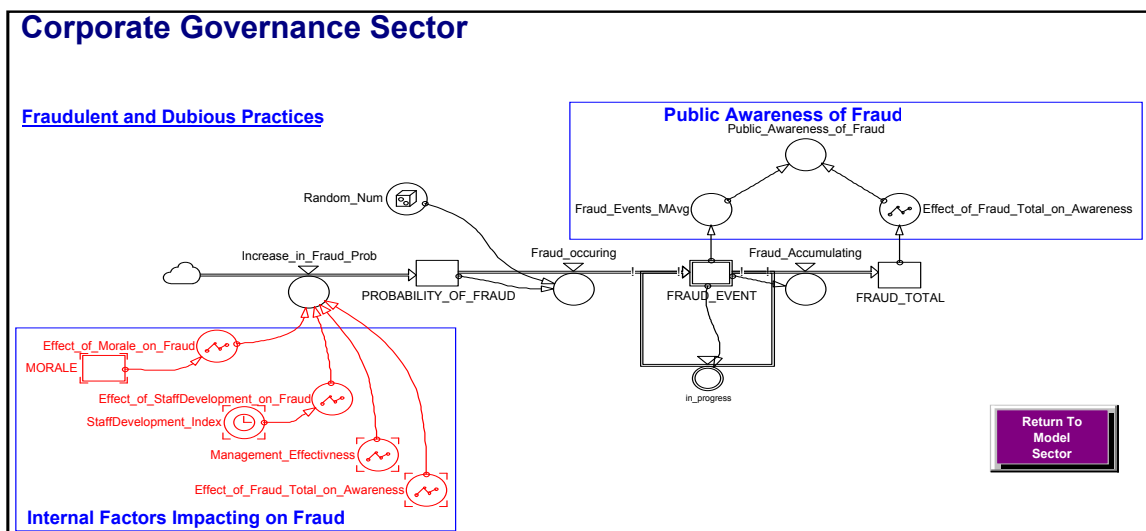


Figure 5. Corporate Governance Sector of Dynamic Balanced Scorecard

Future Developments

(a) Model Validation & Verification

Whilst basic validation has been carried out during model construction, a wide range of parameter values at this stage are simply based on the diverse management literature or the judgment of experienced public service

officials. Analyses will be undertaken to identify the model's sensitivity to such parameters and the more significant ones will be subject to more detailed research. At the same time a very wide range of management literature is being reviewed to provide as much support as possible for the key relationships.

(b) User Validation

The real test of the model will be seeing it in use by corporate managers in their testing of business scenarios. Whilst we have not progressed to this stage, we already have certain foreboding. With the dramatic changes in financial management (especially with the introduction of accrual accounting) and changes in corporate governance, many senior executives do not yet have management information systems which allow them to meet basic reporting requirements. Their focus is still on "avoiding the crocodiles" rather than on the strategic vision of "managing the swamp". Planning the "politics" of implementation is an important aspect of the overall research.

(c) Integration With Balanced Scorecard Software

The final stage of this project will be to link the dynamic simulator with the Department's proposed enterprise information system. At this stage no firm decision on the software has been made: contenders include SAP, PeopleSoft and CorVu. The model design is such that it should be relatively straight forward to draw base data directly from the corporate system regardless of the software choice.

CONCLUSION

Management performance indicators provide the feedback information which triggers management decisions an intervention. They are central to any understanding of organisational dynamics. This paper described ongoing research at the ADFA campus of UNSW which has developed a prototype test led for evaluating the effectiveness of specific indicators and their associated business rules, and "management flight simulation" which enables users to understand the implications of possible management actions consequent an performance information.

Key issues which have been identified from the research project relate more to organization change factors than to modeling. Even the most brilliant modeling will not bring about culture change unless there is a supportive climate. The project has had strong support at the level of the Minister's office and at junior management levels in the Department, but senior management is concerned more about policy than about strategic thinking. The following points are also significant.

- A comprehensive strategic planning framework is a pre-condition to implement a BSC system. BSC is not a magic solution to poor strategy.
- Without a top level "champion", the likelihood of implementing any significant change in management practice is limited.
- System dynamics modeling is most effective where it is done as a mutual learning process between client and consultant. Where the relationship becomes one of 'expert' – 'recipient', the value of any model, however brilliant, is limited.

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