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Incorporating the Balanced Scorecard Methodology into Project Management Processes

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1.0 Introduction

The Federal Government's Defence White Paper has been hailed as a strategic plan for Australian defence. The document identified the critical capabilities that the Government intends to develop over the next ten years. The development of these capabilities will be achieved by the allocation of the necessary resources to major defence programs and projects. Subsequently, the Department of Defence (DoD) developed the Defence Plan with the specific purpose of operationalising this White Paper. It sets out the strategy implementation and the performance management frameworks at the DoD level with the intent of rolling it down to operational levels e.g. Defence Materiel Organisation (DMO) Industry Division.

One of the challenges faced by DMO and the defence industry is to develop a project management framework that would be aligned with the performance management principles outlined in the Defence Plan.

Current project management techniques like Earned Value (EV) are excellent tools for managing the financial and scheduling aspects of a project. However, project managers must also be equipped with a set of management tools that would help them to manage personnel, engineering, customer, risk and safety aspects of a project. For this very reason, the US General Services Administration Office of Governmentwide Policy, following the Clinger-Cohen Act of 1996 (also known as Information Technology Management Reform Act), has identified the Balanced Scorecard methodology as the suitable performance management framework that can be applied to complex technology and IT intensive projects[1]. The management of such projects has always been associated with a high level of uncertainty and risk. There are, no doubt, great project teams that could manage complex projects without formalised performance frameworks, probably by developing their own models. However, from the Government point of view, the *consistent* delivery of such projects on time, within budget and to specification is of great importance. In Australia, one of the major suppliers of project/contract based services to the Australian DoD reported approximately $4 million of savings in the first six months after the Balanced Scorecard framework was driven down to individual contract level. At the same time the quality of their service delivery has improved. These results demonstrate that the thoroughness and the discipline of the Balanced Scorecard framework can be successfully applied to both the corporate as well as project/contract levels. However, there are many examples where the Balanced Scorecard framework has been implemented at a superficial level and not integrated with the existing reporting systems. For this reason, project managers of large Defence based programs have three barriers to overcome.

- The first barrier is to develop a project based Balanced Scorecard framework.
- The second barrier is to integrate this framework with existing project management tools and standards that are related to project financials and scheduling (e.g. C/SCS), engineering capabilities (e.g. CMM), and risk management (e.g. AS 4360) to name just a few.
- The third barrier is related to project governance and performance reporting.

This paper outlines the process that was developed over the past four years and involved three organisations participating in the defence industry in Australia.

[1] See reference 3

2.0 Project Based Balanced Scorecard Explained

The development of an integrated strategic management framework that would help managers in a knowledge-based economy is a major challenge. Project managers must master the management of project budgeting/scheduling, risk, personnel issues, engineering, technology, customer relationship, subcontractors and safety, just to name a few. This challenge has been addressed to some extent by a number of management practitioners and researchers.

Various business performance measurement frameworks have been developed over the years. In the 50's and 60's US based organisations developed project scheduling and budgeting techniques to measure tangible project performance indicators.
To the lesser extent, the measurement of non-financial or softer measures also started to make an impact on business thinking. The French developed the so-called Tableau de Bord, Peter Drucker advocated to use financial and non-financial KPIs in the 60's, while Steven Hronec suggested that a performance framework must be linked to strategic objectives. The concept of a profit chain was introduced by James Hesket et al. in 1994.

More recently, Kaplan and Norton's Balanced Scorecard model integrated the ideas of their predecessors, embracing such concepts as profit chains, financial and non-financial indicators and strategic feedback loops. The major step that Kaplan and Norton achieved was to move beyond performance *measurement*, as the Balanced Scorecard concept embraces the principles of performance *management.* We do not wish to appear to be pedantic when we contrast performance measurement with performance management, this is not just a play of words.
The performance measurement concept is based on a set of Key Performance Indicators (KPIs) grouped in a logical manner e.g. financial, customer, capabilities, etc. Certainly, the early 1992 version of the Balanced Scorecard was based just on the four perspectives and the balanced set of KPIs would be classified as a performance measurement system. However, over the course of four years, Kaplan and Norton made a quantum leap by supercharging their framework with such concepts as a strategy map, initiatives and a strategic feedback loop. These new features allowed the Balanced Scorecard concept to become strongly coupled to the strategy formulation processes and as a result it became a strategy implementation/performance management framework.

2.1 Project Based Strategic Planning

Do project managers need to worry about project strategy or is it enough to treat a project purely from an operational point of view?
The answer to this question depends on the size, complexity and duration of a project. Issues covered by large projects with a multi-year duration are in many respects no different from the issues faced by small to medium size enterprises or business units of large multinationals. The major difference is the fact that a company is meant to be "a going concern", meaning that it will operate into perpetuity, while a project has a defined time boundary. Does this difference give project managers a licence to ignore a set of strategic analysis tools, like customer analysis, competitor analysis, value chain analysis, market positioning, new business development etc?
In some areas there is a direct correlation between business and project functions, e.g. value chain and supply chain, and organisational capabilities. Strategy analysis tools

covering these areas apply to both environments. On the other hand, customer analysis, competitor analysis or opportunity analysis tool sets appear to be less relevant to a project environment. However, through our association with very large projects we were able to demonstrate that it is relatively straightforward to identify more than one fee-paying customer. For instance, in the defence environment, project managers might need to address issues and needs coming out of the government, DMO, or the ADF at the same time. Each of the groups has a direct or indirect influence over the release of payments. Another strategic tool, rarely used by project managers, is that of competitor analysis. Are we better at the development of a project infrastructure, are we better at forming relationships with the suppliers we share with our competitors, are we quicker to adopt new project management techniques endorsed by the Defence Project Office?
Finally, the role of a project manager becomes critical as the corporate offices (especially of a project based organisations) often see a project environment as the cradle for the development of a new competitive advantage. The project manager should ask himself: what new skills, processes and capabilities would the project team develop during the project. And subsequently, how would the project contribute to the organisation's competitive advantage? In order to answer all these questions, project managers need to have a comprehensive set of tools that equip them to manage all aspects of the project environment.

The Balanced Scorecard is one such tool that, combined with Earned Value techniques, can offer an opportunity for project managers to address the above issues. Figure 1 below illustrates a project strategic planning process that has identified four sub-processes: the project strategy formulation, the balanced scorecard, the project budget/schedule performance process and the value creation reporting process. The objective of the project strategy formulation process is to identify project positioning, project value chain, capabilities, project SWOT analysis and others.

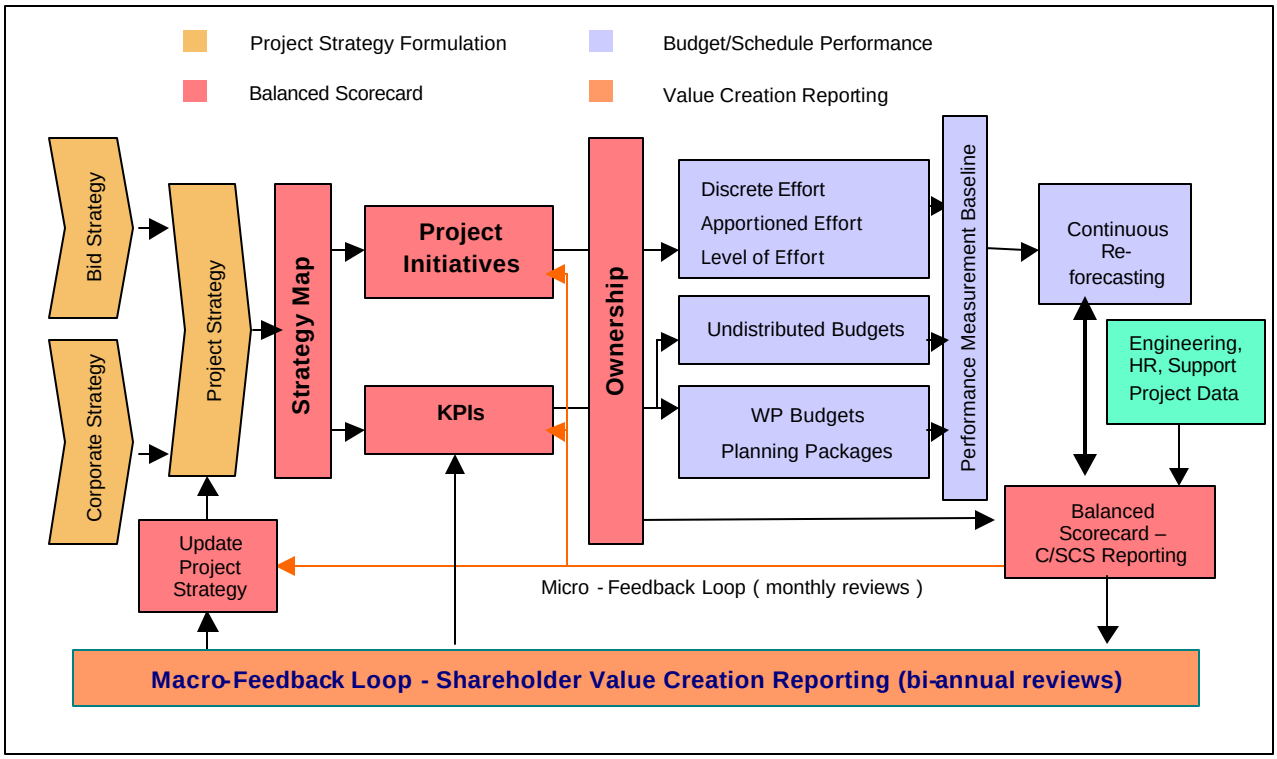

Figure 1. Project Based Strategic Planning Process

Some of the information (e.g. project positioning) would typically come from the bid documents, because it is at this time that an organisation, after analysing customer needs, decides whether it will adopt cost leadership or higher value added positioning. In other words, in order to win the contract, will the organisation utilise already existing and proven technologies and well-known engineering processes or will it need to develop new technologies and new engineering processes?
In Australia, one could think of the Mine-Hunter Costal project as an example of the cost leadership positioning, while the Collins Class Submarine would be an example of the higher value added positioning. Project strategy also should embrace components of corporate or business strategy. Too often projects are seen by the corporate offices just as cash cows with hopefully positive net present values (NPV). Linking project strategy with that of the corporate would provide an opportunity to guide the project manager to develop unique processes and skills that will contribute to the pool of marketable core competencies that in turn lead to the development of competitive advantage.

2.2 Project Strategy Map

Having developed a project strategy, a project manager is ready to adopt the balanced scorecard as a performance management framework. The first step in translating a project strategy is the development of a strategy map as illustrated in Figure 2. The function of a strategy map is to tell a story of the given project. In the example given below, the project strategy identified three strategic themes: *engineer contracted capabilities*, *optimise project resources* and *manage project risk*.

- *Engineer Contracted Capabilities*: This strategic theme focuses on the engineering aspect of the project. At the financial level, not surprisingly, the delivery of the project's milestones was the ultimate strategic objective. However, at the customer level strategic objectives were less obvious. It was a long-term project, which meant that the current technological solutions could become obsolete at the end of the project. For this reason, the customer was expecting the supplier to provide unsolicited advice regarding a possible future solution. With this background the project management team opted to develop *relationship based* project positioning. At the same time, the government was aware of the unusual project set up and was interested in this new model. Project management, although aware of this interest, did not have the mandate or resources to actively liase at this level. For this reason it became the responsibility of the corporate marketing department, as a shared resource, to cover this aspect of this implied requirement.

  In order to develop a relationship with the customer, the contractor had to develop a superior *project communication processes*, and in addition, the project team needed to demonstrate that they mastered standard project management principles by *delivering work packages on time*. The internal project processes perspective illustrates the project's value chain. *The maintain empathy with project goals* strategic objective was related to the project's big picture outcomes, reminding the project team what the customer really expected to procure. The remaining strategic objectives were covering the project initiation, product development, etc. The supply chain is a part of the value chain. This is where the project manger needs to understand, map and measure performance in this area. In order to deliver efficient processes that deliver the products required by the client, the project manager must be able to develop the necessary skills, systems and capabilities. In

addition, to develop a consultative approach to the customer, the management believed that it was necessary to *foster the culture of innovation and motivated employees*, which in turn was a product of other strategic objectives related to skill development, reward policy and IT systems.

- *Optimise Project Resources*: This strategic theme's focus is to ensure that the project resources are used efficiently. The ultimate goal of this theme is delivering the project within the budget. To achieve this goal, the project management adopted the policy of transparency that would allow the customer to have an insight into the budgetary issues related to the project (surpassing contractual obligations). This objective was supported by the development of contract-based commercial processes as well as the project *communication processes* and the development of world-class project management processes.

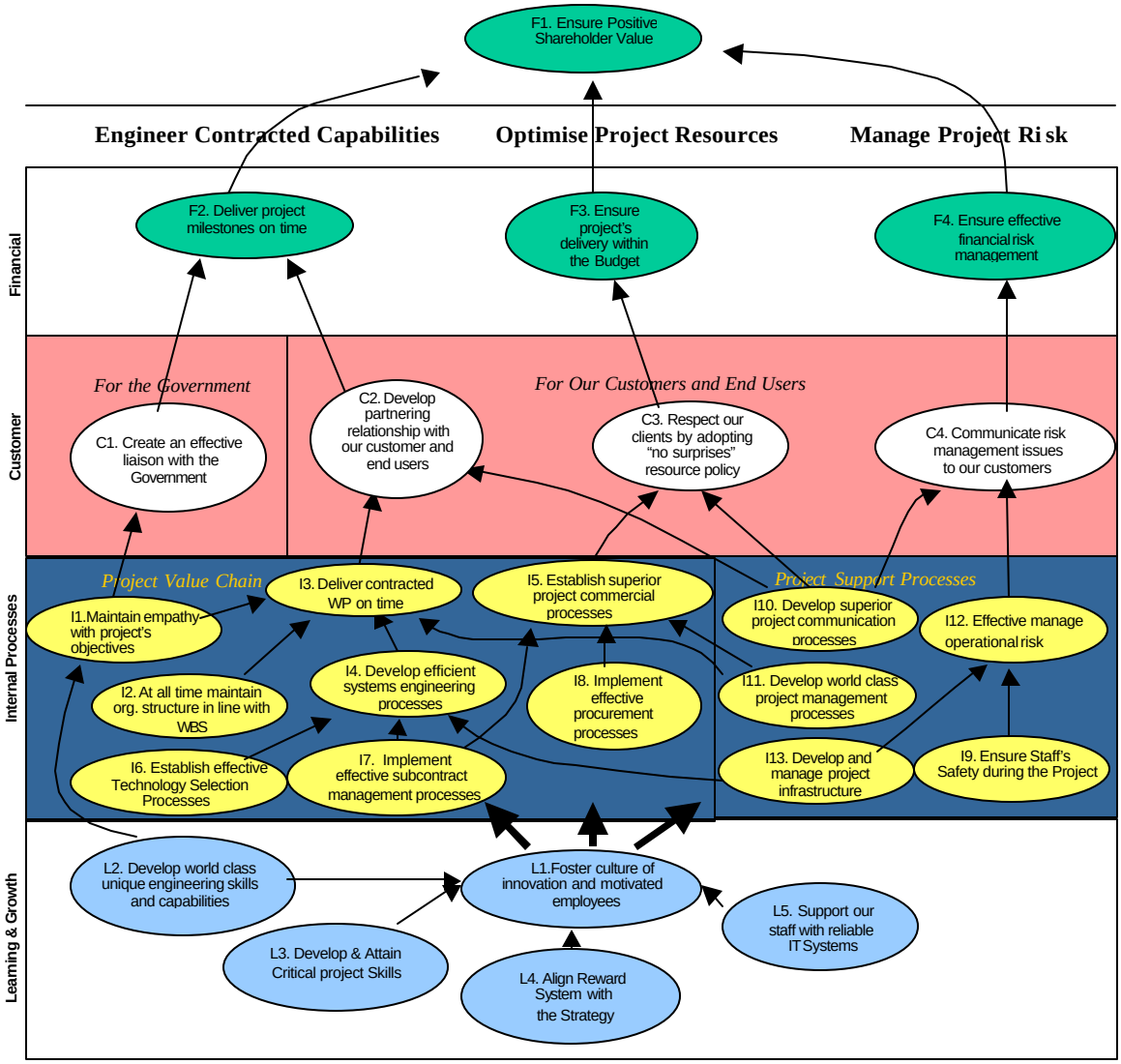

Figure 2. Project Based Strategy Map

- *Manage Project Risk*: With the rapid technological advances and new developmental methodologies, managing project risk became one of the most important strategic themes in the 90's. Projects with no risk are not worth pursuing, while on the other hand projects with unstructured approaches to risk

management will probably fail. The project team divided the risk between two categories: financial and operational. The financial objective is to ensure that project capital reserves are managed prudently by adopting appropriate hedging and cash management techniques. At the operational level, risk management process included six components: risk identification, analysis, evaluation, treatment, monitoring and communication. This risk management process covered the areas of technology selection, engineering difficulty, personnel status and others. As with the previous strategic theme, the project management wished to provide the customer with full transparency to the issues related to the project risk management. For this reason the performance of Key Risk Indicators (KRIs) were reported to the customer regularly.

2.3 Project KPIs and Initiatives

In order to develop a Project Scorecard a project team needs to develop a set of KPIs that underpin the strategic objectives identified on the strategy map. The real challenge is to identify a balanced set of KPIs that include both lagging as well as leading indicators and which will inform the management whether the project's strategic objectives are being achieved or not. In order to illustrate this principle we will analyse in more detail the strategic theme – *Optimise Project Resources*. At the financial level, the project team identified three financial KPIs that support the strategic objective – *Ensure project delivery within budget.* These are the standard Cost/Schedule Control System's (C/SCS) KPIs: Budgeted Cost of Work Performed (BCWP), Ratio of Budget At Completion (BAC) to Estimate At Completion (EAC) and Project Liquidity. BCWP identifies work physically accomplished while the ratio BAC/EAC indicates whether the total cost of the project will be confined to the original estimates. A value of one or above indicates that the project is being delivered within the estimated budget. Project Liquidity on the other hand will allow managers to ensure that the project expenditure is less than the cash flow generated by the project.

At the Customer Communication Perspective level, project managers wished to provide reporting transparency to the customer that would go beyond contractual obligations. For this reason the organisation developed online project management reporting, accessible by the selected customer officials. Two KPIs were identified: Accuracy of Planning Parameters and Project Resourcing Index. The accuracy of Planning Parameters KPI represents the assumptions supporting planning decisions. If project plans are based on inaccurate data or planning parameters, the project plan itself will inevitably be inaccurate. The intention behind the second KPI is the acknowledgement that the project embraces several classes of resources e.g. financial, human/skill, information and knowledge, etc. The index is an aggregate of all resource classes identified by the project management team. It monitors whether the project has the right resources in the right place at the right time. At the Internal Processes and the Learning and Growth levels, the project team identified several KPIs underpinning each of the strategic objectives.

Major KPIs for the Optimise Project Resources theme are summarised in the table below. The traditional view of project management has been that project goals could be achieved by manipulating two variables: time and resources. It is clear that there are more variables that affect project outcome as illustrated by the strategy map and strategic objectives. As the strategic objectives indicate what we wish to achieve, and the KPIs and Targets inform the project team whether the objectives are being

achieved, initiatives specify how the project team is going to execute the project strategy. These are the active programs that help to influence project drivers. The third column in the table above contains a representative list of project initiatives.

Strategic Objectives	*Representative KPIs*	*Representative Initiatives*
F3. Ensure project's delivery within the budget	BCWP	Implementation of Earn Value methodologies
	Cost Variance	
	Project Liquidity	
	BAC/EAC	
C3. Respect our clients by adopting "no surprises" resource policy	Accuracy of Planning Parameters	Development of an on-line project performance reporting
	External Variances Resolved/External Variances Reported	
I5. Establish superior project commercial processes	Variations Approved/Number of Project Variations Submitted	Strategic alliance management training
	Number of unresolved commercial issues	Commercial processes documentation init.
I10. Develop superior project communication processes	Frequency of Communication with Customer	Strategic alliance management training
	Clarity of Communication with Customer	
I7. Implement effective subcontract management processes	Level of subcontractors involvement in project process	Implementation of EV methodologies at subcontractor level
	Stability of relationship with subcontractors	
	Delivery of milestones on time and budget	
	Level of satisfaction with partner's services	
I8. Implement effective procurement processes	Cost of infrastructure acquisition	Development of suppliers evaluation criteria
	Depth of relationship with suppliers	
	Material and Parts Availability / Stock Outs / Inventory	
I11. Develop world class project management processes	Best practice coverage	Update of project management manual
	Plan/Schedule stability	
	Cost of acquiring and maintaining best practices	Project management internal audit
L1. Foster culture of innovation and motivated employees	Staff satisfaction survey	Best innovation award competition
	Number of application per vacancy	
	Number of new patents	Inter-departmental golf competitions
L2. Develop world class and unique engineering capabilities	Multi-skilling	Engineering practices audit
	Best practice engineering	
L3. Develop and attain critical project skills	Skill coverage	Skill gap analysis
	Impact of Training Programmes on Org.	Revision of training programs
		Project induction program

Table 1. KPIs and Initiatives allocated to Optimise Project Resources

Let's take the strategic initiative I10- *Develop superior project communication processes.* The management identified a gap in the area of communication issues with the customer.

For this reason the project team, together with human resources, identified a training program that would help project staff to develop relationship-driven interactions with the customer staff. *Strategic alliance management training* was introduced to raise the project staff's awareness about effective communication styles needed to develop alliance-like relationships with the customer.

3.0 Identifying the Points of Interface between BSC and C/SCS

We have already noted that while the Balanced Scorecard is a performance management system, C/SCS is classified as a performance measurement system. In the project environment, the two approaches are actually complimentary. The government publications related to C/SCS specify 35 criteria that contractors' performance measurement systems must cover. However, it is up to the contractor to decide how to implement these criteria which are divided to five groups: organisation (5 criteria), planning and budgeting (11), accounting (7), analysis (6), revisions and access to data (6). For this reason, once the development of the BSC framework is completed, project managers need to integrate the newly developed framework with the C/SCS.
In order to achieve this goal, it is important to understand the points of interface and the disparities between these two methodologies. Appendix 1 highlights the points of interface between C/SCS and BSC.

The first point of the interface is between the two financial strategic objectives F2 and F3 (see Figure 2) and C/SCS's planning and budgeting criteria (P6, P9, P10 and P11)[2]. This cross-reference is perhaps the most obvious because both methodologies' ultimate goal is to deliver a successful project. As an example let us analyse how the criterion P6 (*Provide that the sum of all work package budgets, plus planning package budgets, within a cost account equals the cost account budget*) interfaces with objective F3 (see Figure 2), which was defined by the project team as: *Ensure that the project is delivered within the budget and that the work performed equals budgeted costs at all time*. In order to be able to measure performance against this objective the project team identified two KPIs. One of them, Project Liquidity was an aggregate measure that included calculations needed to satisfy the P6 criterion.

The second strong point of the interface is between C/SCS's organisational criteria and the first few strategic objectives defining the project value chain. To illustrate how this interface works we will use the O2 criterion (*Identify the internal organisational elements and the major subcontractors responsible for accomplishing the authorised work*). In this case two strategic objectives I2 and I7 (see Figure 2) covered C/SCS' requirement. The project directors saw that managing the internal team required a different approach than managing an external supplier. In addition, the two sets of KPIs for the two objectives formalised this philosophy, further adding to the clarity of the internal and the externally supplied monthly reports.

The third point of the interface is between I10 and I11 strategic objectives and several C/SCS criteria. This is an important point that demonstrates complimentary nature of

[2] For full C/SCS criteria definitions see reference 2.

BSC and C/SCS. The BSC framework does not specify the type of a project management technique that should be utilised by the project team. However, in the definition of the strategic objective-I11 the usage of C/SCS processes were specified and it became apparent that it was necessary for the project team to understand the quality of these processes during the project lifecycle.

Finally, the fourth point of interface exists between the Revision Criteria and the strategic objectives related to the commercial and customer aspects of the project. Here, both frameworks identify the need for the formal communication channel between the customer and the contractor. However, the non-financial KPIs associated with the strategic objectives will allow the management to assess the effectiveness of this communication link more pragmatically.

4.0 Project Governance and Performance Reporting

The next challenge, once the project office has developed the blueprints for the project performance framework, is to deploy this framework throughout the project structures. This typically would require the project team to set up a comprehensive project performance template that allow the rapid production of monthly reports and the delivery of these reports to the interested parties in a such way that the reader could understand the project story quickly.

In order to achieve this goal it is necessary to disseminate the spirit behind the new performance framework. The last thing the project management team would want to happen is for the project staff to think that this is yet another control system imposed on the project by the corporate. For this reason it is critical to convey the logic of this framework to project staff in order to develop communication protocols between different project groups. This phase simply seeks to ensure that the performance framework becomes virtually a project nervous system. To achieve this goal all managers need to be trained in the usage of the framework on a daily, weekly or monthly basis. Project performance monthly meetings need to be adjusted so that the project's performance is analysed and discussed against defined strategic goals. In addition, information systems need to be aligned to aid in the automation of the monthly reports and to deliver the single version of the truth about the project's performance.

5.0 Summary

With increased, multi-faceted complexities, project managers need a set of tools that help them manage project dimensions like financial/scheduling, personnel, engineering, risk, technologies, etc. The Balanced Scorecard, integrated with a standard project measurement system based around Earn Value techniques is such a framework. The two approaches cover different aspects of project management. The Balanced Scorecard links projects to the rest of the organisation through the project strategy map, and allows the project team to define strategic objectives covering such aspects of a project as financial/scheduling, risk, technology, people, etc. On the other hand, EV covers in some detail the financial and reporting criteria that need to be addressed by the project manager, especially on a government sourced project.

This paper described a three-phased approach to the development of a comprehensive project based performance framework. It presented and discussed in some detail a

project based strategy map, a set of KPI and project initiatives. It identified the points of interface between BSC and C/SCS and discussed the project governance issues that must be addressed by the project team. A comprehensive approach to project management such as this can enhance the chances that projects are consistently delivered on time, within budget and to the specification.
However, one of the remaining challenges organisations have is to take a disciplined approach to the development of such a framework. Both executives and operational staff need to be involved at various stages of such project, and all groups need to be adequately trained in the usage of the resulting system.

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Appendix 1 Balanced Scorecard and C/SCS Interface Schedule

		Financial				Customer				Internal Processes												Learning and Growth				
		F1	F2	F3	F4	C1	C2	C3	C4	I1	I2	I3	I4	I5	I6	I7	I8	I9	I10	I11	I12	I13	L1	L2	L3	L4	L5
Organisation	O1									✓																	
	O2										✓					✓											
	O3																			✓							
	O4				✓																						
	O5										✓									✓							
Planning & Budgeting	P1																		✓	✓							
	P2											✓	✓							✓							
	P3													✓													
	P4																			✓							
	P5		BSC Initiatives																	✓							
	P6			✓				✓																			
	P7																			✓							
	P8		BSC Initiatives																								
	P9			✓																							
	P10			✓																✓							
	P11			✓																							
Accounting	A1																			✓							
	A2																			✓							
	A3																			✓							
	A4																			✓							
	A5																			✓							
	A6																			✓							
	A7																			✓							
Analysis	AN1		BSC Feedback					✓												✓							
	AN2																		✓								
	AN3																		✓								
	AN4																		✓								
	AN5																										
	AN6																			✓							
Revision	R1							✓						✓					✓								
	R2																			✓							
	R3																			✓							
	R4							✓						✓						✓							
	R5																		✓								
	R6																		✓								