

NEW ZEALAND

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**Expert meeting on
Management of Large Public Sector IT Projects**

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HAND OUT

NEW ZEALAND

Management of Major IT Projects in the New Zealand Public Sector

TABLE OF CONTENTS

INTRODUCTION	3
1. GENERAL INSTITUTIONAL FRAMEWORK.....	4
1.1. Policy	4
1.2. What constitutes a major project?.....	4
1.3. Accountability.....	6
1.4. Budget and approval process	7
1.5. Monitoring Regime.....	9
1.6. Governance of Major IT Projects	9
2. CASES	13
2.1. Case Study 1: Risk-based Funding Rules for Complex Projects	13
2.2. Case Study 2: Customs Department CusMod Project	18
2.3. Case Study 3: Performance of IT Projects in the New Zealand Public Sector	19
3. LESSONS LEARNED.....	21
Technology and Architecture	21
Governance and Management.....	22
Risk Management Process	22
Change Control	23
Project Formation.....	23
The Contract.....	23
Project Implementation	23
4. FUTURE PLANS	24
5. LITERATURE, WWW, AND STUDIES	25
APPENDIX A BUSINESS CASE CHECK LIST.....	26
APPENDIX B LESSONS LEARNED AND RECOMMENDATIONS	29
B.1. Technology and Architecture	29
B.2. Governance and Management	30
B.3. Risk Management Process.....	34
B.5. Project Formation	37
B.6. Project Approval.....	38
B.7. The Contract	39
B.8. Project Implementation	39
B.9. Approval and Monitoring Regimes	40

INTRODUCTION

PUBLIC SECTOR IT PROJECT PERFORMANCE IN NEW ZEALAND

The New Zealand public sector, as defined by the OECD “working definitions”, has around nine major IT projects in progress in any given year. Currently five of the major IT projects are classified as high risk and subject to close monitoring by the State Services Commission (SSC) and The Treasury.

History has created the impression that public sector IT projects have performed poorly due to a number of high profile failures. However recent research clearly shows this not to be so, compared to the private sector and internationally.

This research, commissioned by the Department of the Prime Minister and Cabinet (DPMC) in November 1999, was to determine:¹

- The successes and problems in New Zealand public sector IT projects.
- The key contributors to success and deliverables.
- How public sector projects compare with those in the private sector.
- How New Zealand IT project performance compares internationally.
- What opportunities exist for improving IT projects deliverables.

The key findings of this research were that IT project performance was slightly better in the public sector than the private sector; there was little difference between New Zealand and international performance; and there is significant room for improvement.

There have been a number of initiatives by Cabinet over the last 12 months to improve the IT project monitoring and approval processes. Although some changes occurred prior to the research report, it was too early for their impact to flow through into the report’s findings.

More detail from the DPMC research is included below in the Case Study Section (2).

1. ‘Information Technology Projects: Performance of the New Zealand public sector in perspective’, SIMPL Group and NZ Institute of Economic Research (Inc).

1. GENERAL INSTITUTIONAL FRAMEWORK

1.1. Policy

There is an accepted governance structure to support major IT projects in the New Zealand public sector. Within this structure the monitoring agencies (SSC and The Treasury) develop their approach to each IT project following consultation with each other and agreement from the Chief Executive (CE) of the agency planning the project.

There is an agreed budget process and monitoring regime based on the imperative that the CEs are accountable for the project business case, budget, project implementation, and deliverables.

There are also a number of guidelines, pointers to the best practice for agencies to follow and approaches to monitoring of major IT projects by the SSC and The Treasury.

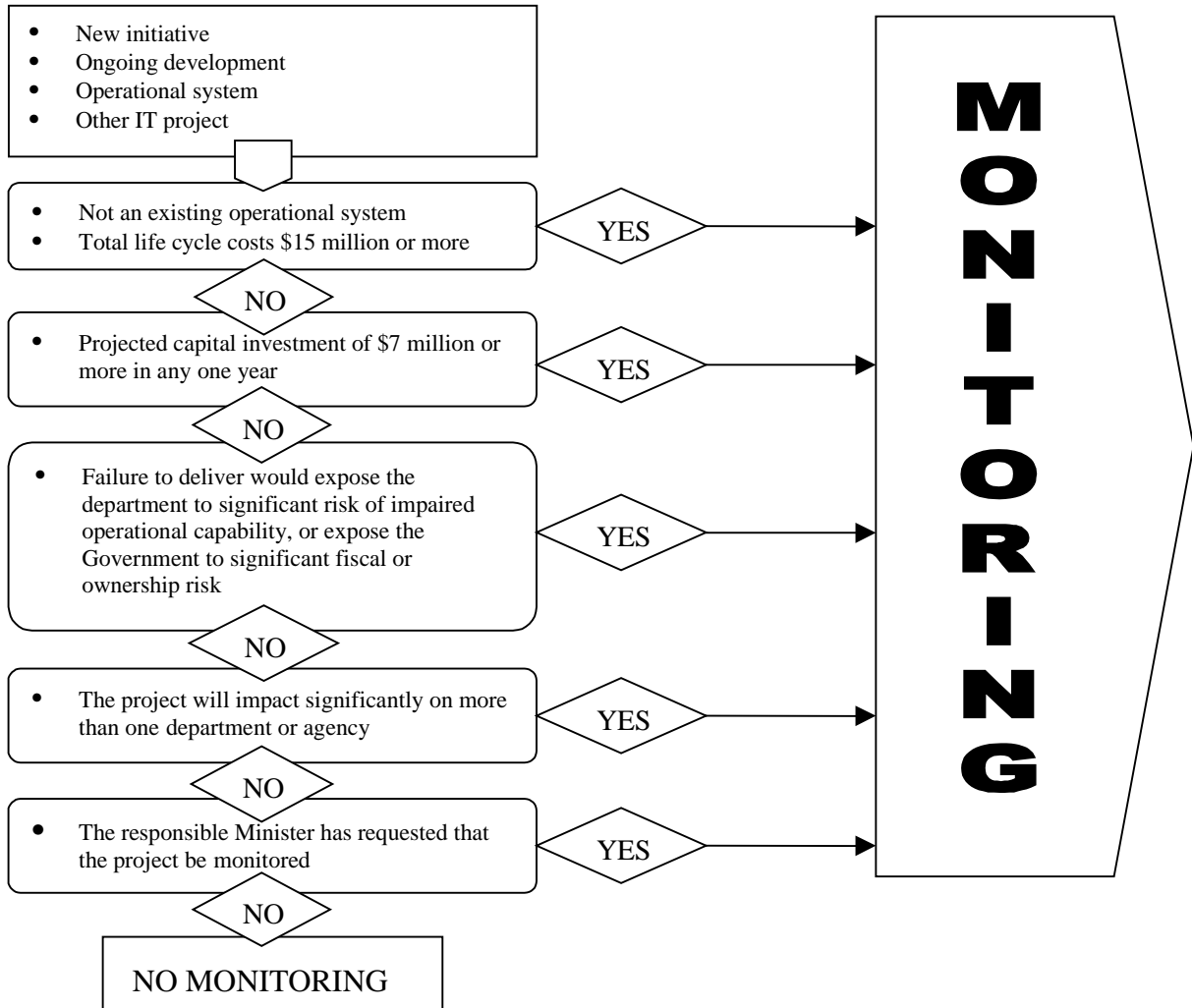
1.2. What constitutes a major project?

A major IT project is a new initiative, an ongoing development or acquisition project, an operational system, or other type of IT project (including studies against existing contracts) that meets any one or more of the following criteria:²

- The project is not an existing operational system and its projected life cycle costs are NZ\$15 million or more (gst inclusive). Costs include all equipment, software, contractor services, supplies, staff compensation and related staff costs, and inter/intra agency payments.
- The project includes a projected IT capital investment equal to or exceeding NZ\$7 million (gst inclusive) in any one year.
- Failure to deliver the project in line with the projected functionality requirements, costs and timeframes would expose the department to risk of impaired operational capability, or expose the government to fiscal or ownership risk.
- The project will impact significantly on more than one department or agency.
- The responsible minister has requested that the project be monitored.

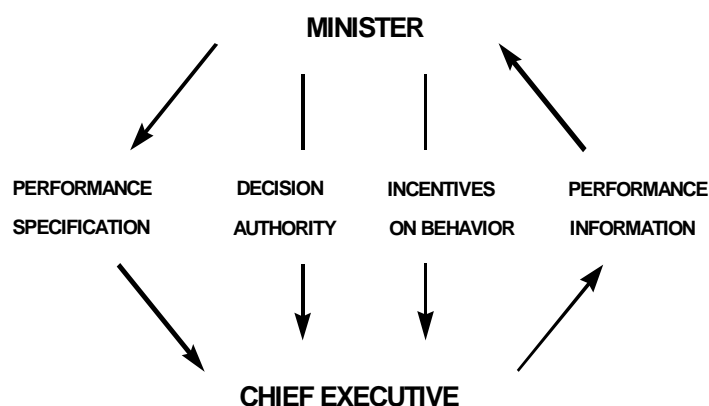
2. Cabinet decisions in 1999 and 2000.

The following diagram depicts the process of deciding whether or not a proposed project is to be monitored.



1.3. Accountability

The public service CE accountability framework consists of a series of relationships underpinned by legislation and documents. This framework is shown below.³



Under this model, the responsible minister:

- Specifies certain standards of performance for the CE to meet.
- Delegates decision-making authority (including the allocation of resources) to the CE.
- Establishes appropriate performance incentives for the CE.
- Requires the CE to certify actual performance, through independently verified reporting.

The following table shows the key elements of an IT project and how they fit into the accountability framework.

Accountability Element	Key Documents/Project Elements	Responsibility for Element
1. Performance specification	IT strategic plan Individual project business cases Relevant milestones in CE performance agreement	Department prepares Department prepares, monitoring agencies advise, Cabinet approves Department prepares, SSC implements and monitors
2. Decision authority	Ministerial approval	Responsible Minister (within legislative and Cabinet authority)
3. Incentives/sanctions	Annual performance review against performance agreement	State Services Commissioner
4. Performance information	Project reporting and independent QA (if required under monitoring regime) Departmental quarterly reporting (unaudited) Departmental annual reporting (audited)	Department for original preparation Monitoring agencies and independent QA for external monitoring

3. The Chief Executive Accountability Framework and Budget Process as they Relate to Information Technology Projects. The Treasury and SSC report to Government, April 2000.

The specification of performance and the delegation of authority take place during the budget process for approval of IT projects. The requirements for performance information and operation of incentives/sanctions form part of the monitoring regime for IT projects. The CE's financial accountability includes:

- Full control of the level of working capital held by the department.
- The right to sell or dispose of surplus fixed assets without Cabinet approval.
- The right to use the department's working capital to purchase new assets without prior ministerial or Cabinet approval within certain delegated limits,⁴ and provided the total value of the department's assets is not increased.
- The responsibility for capital budgeting, asset maintenance decisions and risk management.

Therefore, if the cost of an IT project is within the delegated limits and can be funded from the department's balance sheet, Cabinet approval is not required. However, if the project requires partial or full new funding, or exceeds the responsible minister's delegation limits, Cabinet must approve its funding.

1.4. Budget and approval process

Any request for new funding for a major IT project must be approved by Cabinet, as the Executive arm of government. In certain circumstances, departments seeking to invest existing capital in an IT project must also seek Cabinet approval. The Cabinet approval process is commenced when the responsible minister puts forward a department's proposal and business case to Cabinet. In certain cases the project may be considered by a Cabinet sub-committee in the first instance, but the final decision will be taken by Cabinet. This decision is then considered for ratification by Parliament as part of one of the two annual Appropriation Acts.

The table below sets out the recommended budget process for delegating authority to the responsible minister and CE. This approach may not be the most appropriate for low-risk, small or low-cost IT projects, but should be followed unless otherwise agreed between monitoring agencies, the department and the minister.

Step	Stage in process	Supporting document	Owner	Approver	Timing
1	Strategic planning	Strategic business plan IT strategic plan	Department	Responsible Minister	Any time during year
2	Initial approval for scoping for each module	Business case (focusing on strategic fit with indicative costs)	Department	Cabinet	Budget round (to allow trade-offs with other projects)
3	Approval of capital injection for each module	Revised business case (with detailed costings, benefits, deliverables and project management)	Department	Cabinet	Following completion of submission
4	Completion of each module	Report with independent QA	Department (independent QA if required)	Joint Ministers	Following completion of each module
5	Annual CE performance review	Report of achievement against business case	Department	State Services Commissioner	End of each year

4. The current limits are that CEs have authority to spend up to \$7 million on capital expenditure without ministerial approval. The responsible minister's authorisation is required where the total cost of capital expenditure projects is between \$7 million and \$15 million. Cabinet approval is required for capital expenditure greater than \$15 million. Prior to 1999, the delegation limits for capital expenditure were lower, with any project over \$5 million requiring responsible minister approval, and any project over \$10 million requiring Cabinet approval.

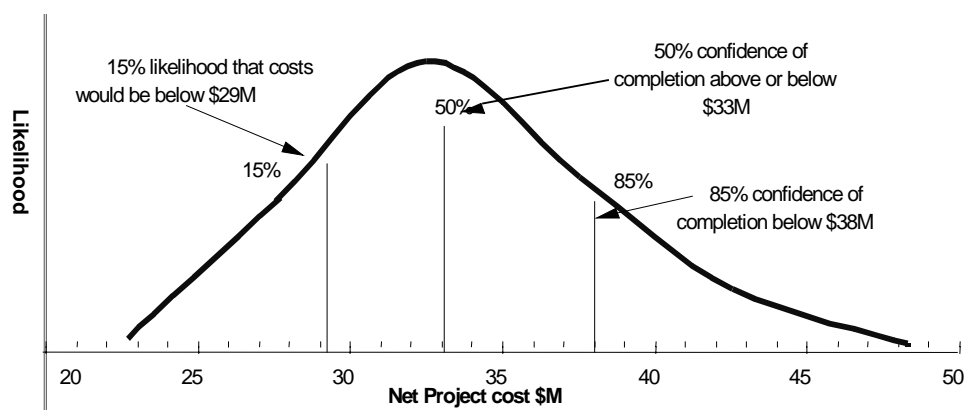
Following approval of a major IT project, a quantitative risk analysis approach is used as the basis for appropriations, access to contingency funding and cash draw-downs.⁵

Quantitative risk analysis techniques and risk-based funding, where cost-effective, incorporate the relative risk of the project into the funding decision, and make risks explicit to ministers considering the business case.

Quantitative risk analysis involves assessing each risk (impact and probability) and modelling the project outcome on simulations of these risks. This will produce an estimated probability distribution of total costs. The final probability distribution describes the range of outcomes and their relative likelihood. The potential impact of both project-specific and other risks on costs, benefits and timeframes are then considered explicitly by the department, monitoring agencies and ministers as part of the project analysis. Examining the distribution enables high risk proposals to be identified and deferred. Because such projects have a very wide range of likely total cost outcomes, their deferral may allow the department to identify or implement strategies to reduce risks.

Using this approach, the approved baseline amount would be based on the most likely cost (the 50th percentile on the distribution), but the department would initially receive cash to less than the 50th percentile. If project risks materialise, the department could seek Joint Ministerial approval for cash disbursement up to the approved baseline. For example, the funding structure for one current IT project means the department receives cash up to the 15th percentile on the probability distribution, with the facility to request Joint Ministerial approval to disburse cash between the 15th and 50th percentile. If costs appear likely to exceed the 50th percentile appropriation, further Cabinet approval must be sought to continue the project.

This is illustrated below.



While this risk-based approach to funding may not on its own prevent cost over-runs, using a funding distribution enables the fiscal impact of the project's risks to be made explicit to ministers in their consideration of the business case. At the same time, it provides some flexibility for departments to manage their projects within defined parameters. However, as the use of quantitative risk analysis techniques is resource intensive for departments, it may only be cost-effective for major IT projects.

Although both the contingency and quantitative risk analysis approaches may be appropriate in certain circumstances for "major" IT projects, quantitative risk analysis appears to be the most appropriate means of incorporating risk into the project decision and funding.

5. The Chief Executive Accountability Framework and Budget Process as they Relate to Information Technology Projects. The Treasury and SSC report to Government April 2000.

1.5. Monitoring Regime

In July 1997 Cabinet set up a monitoring function for major IT projects in the public service following ministerial concern over the management of the risks of IT projects, in particular the National Library's NDIS and the Police INCIS projects.

Since 1997 a number of refinements have been made to the CE's accountability as it applies to IT project management, and the budget process in relation to the estimation of costs for IT projects.

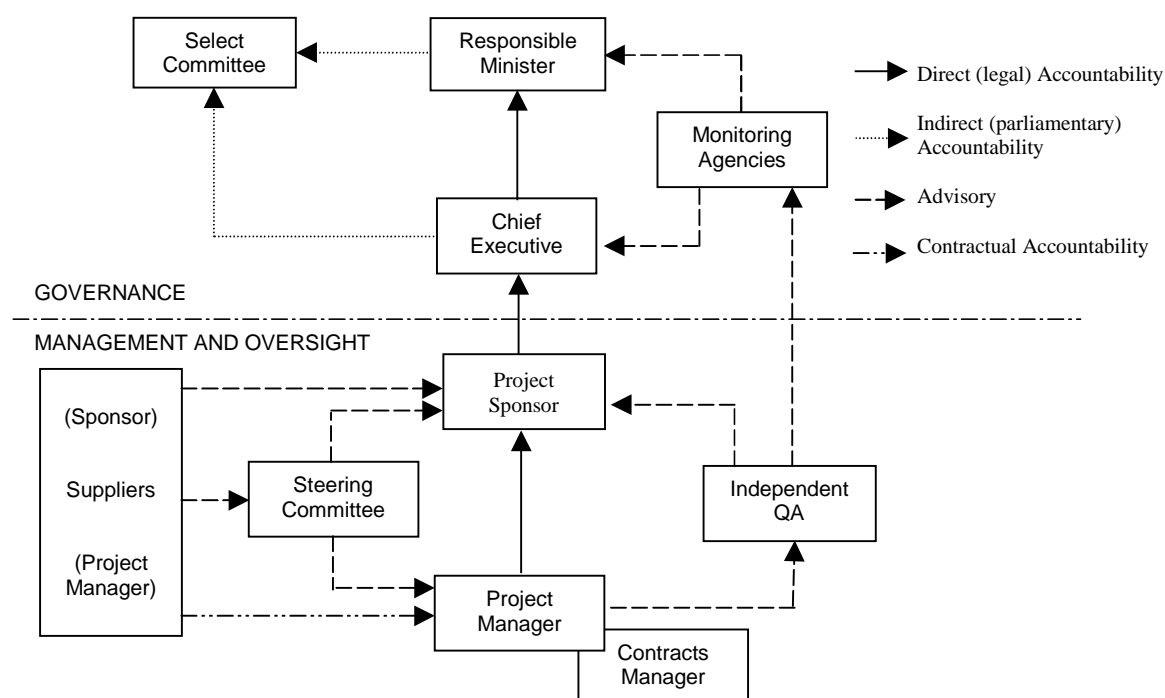
The current monitoring regime is as follows:

- For IT projects, the CE of the initiating department is accountable for:
 - a) Ensuring that the business case is sound and the department's risk management, project management, and monitoring structures follow "best practice".
 - b) Delivery of the module and associated benefits, as outlined in the business case.
 - c) Processes put in place to manage off-track projects, if this becomes necessary.
- On all major IT projects, departments ARE required to provide regular independent quality assurance (QA) reports to the project sponsor and CE on key issues and risks arising from the project.
- Departments are required to forward an unedited version of the independent QA reports to the State Services Commission (SSC) and The Treasury.
- The SSC and The Treasury will make provision for external QA of off-track projects, reporting to the monitoring team but charged to the department.
- The Ministers of State Services and Information Technology receive regular reports on the risks associated with IT projects across the public service.
- The SSC and The Treasury, with an interdepartmental group, produce "good practice" guidelines on principles, processes and practices for developing and managing projects with a major IT component.
- The agreed guidelines are used by The Treasury and the SSC when assessing departmental performance and capital funding bids.

1.6. Governance of Major IT Projects

In the central government context, it is important to distinguish between "governance" and "management" roles. Governance and oversight are undertaken by those with the authority to approve projects and the use of resources for those projects; management is about the actual delivery of projects. Overall, CEs, ministers and parliamentarians have a governance role; project sponsors and project managers a management role.

The following diagram summarises the relationships between the roles.⁶



1.6.1. Roles

Project Sponsor

The Project Sponsor is accountable for promoting the interests of the project, monitoring its progress, ensuring that it is appropriately resourced, mediating its interests with any competing interests of other business units, and, in general, facilitating achievement of the CE's interests in the project.

Project Manager

A project manager becomes accountable for a project after agreement with the CE (delegated to the Project Sponsor) that he or she will deliver the specified deliverables within the framework of the management strategies, and taking account of the project risks.

There are reciprocal responsibilities between the Project Manager and the CE.

From the CE's perspective, the Project Manager is responsible for ensuring the project deliverables within time and budget unless variations are approved by the Project Sponsor. The CE relies on the professional expertise of the Project Manager to achieve these deliverables.

From the Project Manager's perspective, this assumes that the CE, through the Project Sponsor and his or her staff, has confidence that the specification of the new system and contracts with suppliers will deliver what the Department wants, and that the CE will provide the framework and resources to enable this.

6. Governance and Oversight of Large IT Projects. Office of the Controller and Auditor-General.

Contracts Manager

This is an emerging, usually part-time role, which is likely to require a commercial or legal background, and might be sourced either externally or internally.

The Contracts Manager is accountable for monitoring and reporting on the compliance of each party's formal and informal obligations, on behalf of the customer.

Establishing and monitoring reporting requirements is a key part of this role.

The Contracts Manager advises the CE of the impacts any proposed change may have on the contract, especially liabilities and warranties.

Chief Executive

The CE is responsible for the resourcing and appointment of key personnel for the project. These are amongst the most critical decisions to the project's success. The CE needs to be fully satisfied that the Sponsor and the Project Manager have the requisite skills and experience.

The CE is also accountable for the use of funds allocated to the project, ensuring:

- that the business case is sound, and:
 - a) is linked to the strategic plan.
 - b) is able to deliver the business benefits.
 - c) identifies the proposed technology for delivering these.
 - d) specifies the method of implementation, for example, usually to free the infrastructure from applications and provide for the delivery of business benefits in modules.
 - e) assesses any uncertainties in the financial estimates.
 - outlines the main risks and the proposed risk management process.
 - outlines the project governance and management structure.
- that the project team is actually delivering the specified system to the schedule.
- that the organisation is preparing itself to use the new system and its business processes to meet the department's business objectives.
- that the risks arising from the project are manageable and reported to Government.

Monitoring Agencies

The Treasury and SSC officials are accountable to their ministers to provide correct, complete and timely advice on the viability of the business case, on monitoring project progress against benchmarks, on the risks arising, and to alert ministers in advance of any difficulties. There should be no surprises.

Responsible minister

The responsible minister is accountable to Parliament for the performance of the department, including its management of the project. Government periodically modifies its political direction. Where

this changes the business objectives of a department with a project in progress, the minister needs to consider the impact on the project deliverables, time scale and budget in the following ways:

- Is there any conflict between the objectives and deliverables of the existing project and the new policy or legislation?
- If there is, should the project proceed?
 - If so, what changes are needed to ensure it delivers the new political direction? What allowance should be made for the new time and cost to deliver to the modified policies?
 - If not, the minister should withdraw funds and cancel the project.

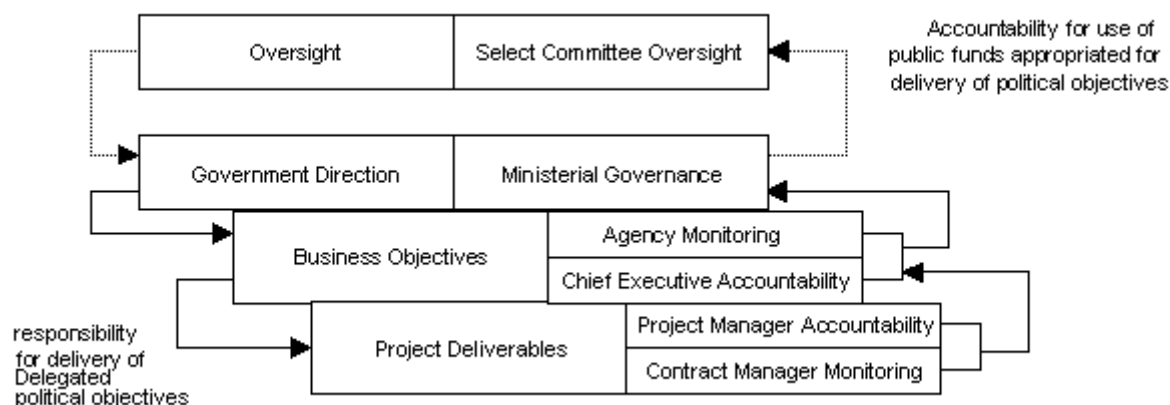
Select Committee of Parliament

The functions of the Select Committee are to:

- review the capital components (if any) of the Estimates for each department, during examination of the Estimates; and
- review the department’s performance and current operations – and its capability (including IT capability) during the annual financial review.

Select committees can also undertake special inquiries into any aspect of departmental activities, including IT projects.

This means that, unless a project requires a significant capital injection, or is a very significant part of a department’s activities, the Committee is unlikely to be proactively informed of its status and health by the department.



Independent Quality Assurance

Independent Quality Assurance (QA) has an established role in the project. As a general rule, QA reports should be made directly to the highest level of project management - such as the CE, Project Sponsor and Project Steering Committee. QA reports are most effective when they are distributed unfiltered to the Steering Committee. They should not be subject to any undue influence from the Project Manager. They should also be made available directly to monitoring agencies.

Major IT projects should ensure that QA consultants are very senior, experienced and independent, thus able to provide objective opinions. Extra cost incurred for this expertise is low relative to its benefits.

2. CASES

2.1. *Case Study 1: Risk-based Funding Rules for Complex Projects*

Overview

Land Information New Zealand (LINZ) and The Treasury have improved management and ministerial decision-making by adopting quantitative risk analysis techniques to estimate costs and completion time for a major complex IT project – “Landonline.”

Endorsement of this approach by Cabinet and the Auditor-General is a major development in the evolution of public sector IT project planning and implementation. The quantitative risk analysis approach has also been adopted by a number of public and private sector organisations.

About LINZ

LINZ holds more than 30 million land records and provides annually 1.5 million title searches, processes 900 000 land transactions, and approves 18 000 survey plans. LINZ started the Landonline project in 1997 to automate processes for title registration and survey approvals.

At the time, public sector approvals for business case expenditure were based on collating single-point estimates for the likely least cost and duration of each project component, with no formal contingency funding.

Due to the limitations of this funding approach for projects such as Landonline, LINZ and The Treasury developed a quantitative risk analysis and associated funding methodology. This methodology has now been endorsed by Cabinet and the Auditor-General and adopted by other public and private sector users as a basis for deciding on investment in high-risk projects and controlling ongoing project funding.

Conception

LINZ used the old approach in 1997 to estimate and secure funding for Landonline but its limitations became apparent when market quotes exceeded initial cost and time estimates. Unquantified risks that materialised in 1999 compounded the situation.

LINZ and The Treasury decided to develop a better way to assess possible cost, timeframe, and benefit deliverables for IT projects, based on the likelihood and impact of identified risks materialising. The type of quantitative risk analysis used to simulate risk impacts on oil exploration project costs and timeframes was seen to have potential.

Implementation and Evolution

Undertaking quantitative risk assessment involved:

- Risk identification to create a risk register and assign owners for each risk.
- Risk impact workshops to assess their effects.
- Detailed assessment of project dependencies and the inter-relationships between individual components.
- Using quantitative risk analysis software to build a model of the impact of risks on *Landonline*, generating a probability distribution curve. Rules were developed to control access to funds based on agreed reporting arrangements and project governance. The risk analysis and associated rules were used to support Cabinet submissions seeking funding and support.

Purpose

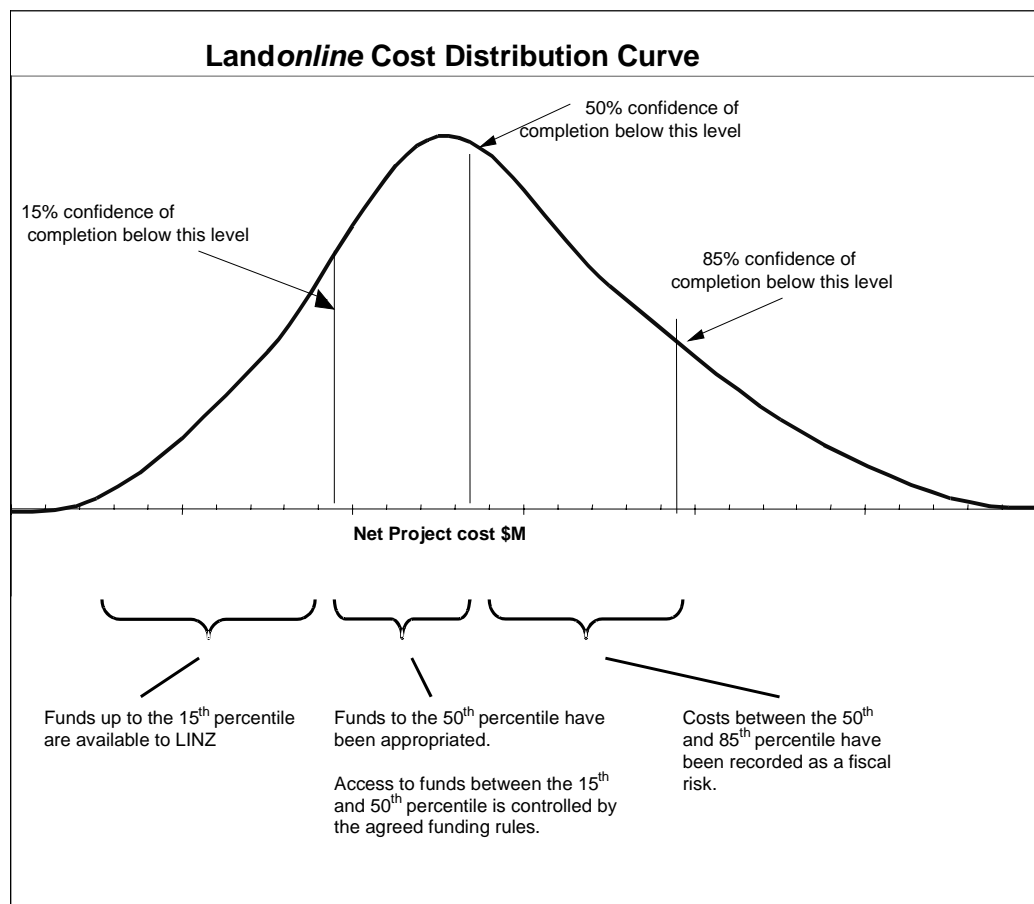
LINZ and The Treasury adopted quantitative risk analysis and developed the associated funding methodology to:

- Create a tool capable of identifying benchmarks to monitor progress and performance of the entire *Landonline* project.
- Monitor individual components of the project over the course of each financial year and over the project's life.
- Provide LINZ management, The Treasury and the Minister with a better understanding of the cost and time risks associated with *Landonline*.
- Provide LINZ and the Minister with a clear understanding of accountabilities for the financial management of the *Landonline* project.

Nature and Scope

Outputs of the risk analysis provide decision-makers with representations of possible outcomes. The level of uncertainty (as a result of risks that may materialise) can be presented graphically as a spread of the distribution of likely outcomes (see Figure 1).

Figure 1.



The distribution curve makes it easy to see that a range of possible project outcomes exists. This enables ministers and public sector officials to understand and accept that project costs are not fixed but are expected to fall within an identified range, depending on the likelihood of risks materialising.

Funding Methodology

Because the range of project funding costs is linked to the likelihood of risks materialising, LINZ and The Treasury were able to develop a clear set of funding rules to govern access to appropriations. Cabinet has accepted these rules.

Using the new methodology, LINZ has been appropriated funds for Landonline to the 50th percentile of likely completion cost but may incur expenditure only up to the 15th percentile.

Access to funds above the 15th percentile requires ministerial approval and is subject to LINZ demonstrating that additional expenditure is justified because an identified risk has materialised. Only Cabinet can approve expenditure that results in the total cost of Landonline exceeding the 50th percentile.

Controls

Deriving distribution curves for individual project components enables management control, management reporting, and creation of incentive frameworks to control activities and monitor progress throughout the project's life.

The work required to quantify risks within discrete components of the overall project enables early identification of risks materialising, and early implementation of mitigating strategies.

Specific Innovations

Specific innovations related to the introduction of this methodology include:

- Introduction of an explicit risk management approach to public sector project management.
- Introduction of funding rules that recognise the uncertainty in cost and timeframes, and that allow for expenditure variations on individual project components and variations in expenditure between financial years.
- Incentives for project managers to identify and disclose risks.
- Recognition of the likelihood and impact of risks, making them more visible and measurable.

Improved Communications

Other innovations include the clarity with which projects can be explained and communicated to interested parties. Graphical representation of likely and possible project outcomes simplifies explanation of the parameters of key project variables.

Better Budget Management

The methodology supports integrated control frameworks for measuring, reporting and monitoring progress against estimates of cost, quality, time and other identified risks.

Project component budgets are now managed within approved ranges rather than as discrete budgets based on single-point estimates. An incentive framework that fosters desired outcomes can be applied to each project component.

Better Project Management

Management control and financial performance is reinforced because funding rules give flexibility to transfer under-expenditure or over-expenditure between financial years and between project components, without resubmitting the business case. This rolling risk-adjusted funding increases management control and the ability to enforce accountability by:

- Risk ownership and early development of mitigation strategies.
- Providing incentives for managers to manage risks for which they are accountable.
- Easily and rapidly modelling the effect of changes to business case assumptions.
- Providing timely information on the effect of a change in any component on the likely outcome of the entire project.

- Involving monitoring agencies, vendors, operational staff and users in identifying and quantifying risks.

Multiple Benefits

Quantitative risk analysis in the public sector budgeting and appropriations process benefits many stakeholders, including:

- Taxpayers – benefit from improved assessment of the viability of complex projects and from better management of public sector risks.
- Ministers – benefit from improved assessment of the viability of complex projects, better disclosure and communication of project risks, and a clear set of rules governing accountability for project budgets.
- Monitoring agencies – benefit from improved assessment of the viability of complex projects and from the existence of benchmarks against which to measure progress.
- Public sector – benefits from an approved methodology to construct business cases for approval, and from the fact that effective project monitoring limits media and public perceptions of poor management.
- Project managers – benefit from improved understanding and management of risks through better identification, assessment and modelling of their impact and likelihood.
- Professional bodies – benefit from a wider understanding, acceptance and use of quantitative risk analysis techniques.

Benefits for LINZ

As a result of developing this methodology:

- LINZ managers are more aware of risks, their impacts and mitigation options.
- Quantitative risk analysis is now a standard technique in LINZ.
- Control and monitoring is more robust, and processes for adjusting estimates are seen to have a sound, objective basis.
- LINZ's relationships with monitoring agencies have improved because of their involvement in risk identification and an agreed framework for monitoring and adjustment.

Confidence in Outcomes

Integration of the quantitative risk analysis methodology into government budget, appropriation and public sector control processes, replacing single-point estimates, is a measure of its success. This is illustrated by the following:

- Cabinet has endorsed the methodology and made it a requirement for all major public sector IT project business cases.
- The Auditor-General has sanctioned the methodology.
- Ministers, ministerial sub-committees and advisory boards have greater certainty and confidence in the outcome of *Landonline* due to the rigour applied to identifying cost and time risks and the clarity of communicating their impact.
- *Landonline* is progressing on target and operating within the new business case parameters.
- The LINZ CEO spends less time dealing with media inquiries about budget issues.

Cabinet Endorses for Wider Use

The initiative is easily replicable, and benefits projects with risks on account of long timeframes, or where a large initial investment is required before benefits are realised. Evidence of replication is seen in Auditor-General and Cabinet endorsement throughout the public sector and adoption by other organisations. The cost of replicating this innovation is minimal compared to the scale of potential savings and the gains in better management and financial control.

Adopted in the Private Sector

One of LINZ's private sector IT vendors has adopted the methodology and is applying it to the internal risk analysis and project tendering processes.

LINZ is applying the methodology to non-IT projects, such as the Continental Shelf Delimitation programme and Crown property litigation cases.

2.2. Case Study 2: Customs Department CusMod Project

From 1992 to 1997, the NZ Customs Service underwent an extensive and successful programme of change called CusMod7 (Customs Modernisation) in order to improve its organisation.

The management team began by preparing an intensive strategic plan, with the purpose, as the CE put it, of getting "everyone pointing to the same compass point".

The team started to work with other senior managers to understand better the wider environment in which Customs operated. In particular, they had a series of meetings with key stakeholder groups to identify the ways in which Customs could become more effective. These meetings showed that there was not only a need for a change in work processes, but also for some major "attitudinal" change. Customs was widely perceived as a "policing, law enforcement agency" with little regard for customer service or client responsiveness.

It became clear that the old system of random checks would no longer work. Customs needed to become more sophisticated, to capture high-quality intelligence in order to target its interventions. This new philosophy was based on striving for minimum intervention by stopping only "high-risk" goods and passengers.

7. Building the Intelligence-Based Organisation: The New Zealand Customs Service. June 1999, Derek LeDayn and David Keane.

Once this vision was in place, and senior executives supporting it, CusMod had a clear mandate to proceed. With key stakeholder expectations under close management, the CusMod programme could begin transforming the organisation. Customs soon discovered that this would require substantial outside support, both in sheer resources to do the work, and in knowledge and expertise (especially in change management) which were not available in-house.

Customs decided that it wanted a “business partner” who would work with them in understanding the business, work out the goals, architect a solution, and then help in selecting and building the component parts of the solution. Above all, they were looking for a partner who would share responsibility for implementation – thus reducing risk to Customs.

Following a tendering process which produced a shortlist of three candidates (from 55), Customs appointed Andersen Consulting as its partner. This firm had recently completed a high-profile IT project with the New Zealand Inland Revenue Department. Although it did not have a track record in the customs business, its proposal showed a “genuine willingness to share responsibility throughout the programme.”

By establishing new work processes, systems, technology, and modes of behaviour, New Zealand Customs has developed a robust and responsive infrastructure and become one of the most innovative customs organisations in the world. The successes of the CusMod programme have been dramatic:

- The average time to clear goods through Customs has been reduced from 1.5 days to 40 minutes or less, for 90% of imports.
- Over 50% of goods are now cleared in transit. Goods can be collected directly from ships and aircraft without being stored on the wharf or in warehouses, thus reducing importers’ costs.
- All communication for the importation of goods into New Zealand is now fully electronic.
- Passengers can now be “cleared in the air”. High-quality intelligence targets and checks high-risk individuals as they leave their aircraft, so that less than 2% of passengers are stopped (down from 10%).
- Client satisfaction across a range of services has been significantly improved.

The main reasons for CusMod’s success were:

- The philosophy of “striving for minimum intervention by stopping only high risk goods and passengers” had real meaning to management and staff.
- Staff and management participated in the development and achievement of the strategic plan.
- Changes to the business processes were clear to all stakeholders and most staff did not feel threatened by the change.

In other words, staff knew what needed to be done, were in agreement with it, and focused on its achievement.

2.3. Case Study 3: Performance of IT Projects in the New Zealand Public Sector

The following are edited extracts from the report commissioned by DPMC summarising the results of the five areas commissioned for research. They provide a good overview of current New Zealand public sector IT projects performance.

The research approach and criteria were similar to that used by The Standish Group.⁸

8. The Chaos Chronicles. The Standish Group (1999).

The rate of successes and problems

Two sets of project performance criteria were adopted:

Tight (*project management*) – “Was the project on time, within budget, and to scope?” (These were the criteria used by Standish, and were adopted for this project in order to achieve comparability with the US results.)

Broader (*project product*) – “Did the project achieve organisational goals, in an acceptable timeframe and at an acceptable cost?” (This was adopted as a pragmatic basis for assessment of projects in the New Zealand private and public sectors, and to indicate the sensitivity of results to the definition of success adopted.)

New Zealand public sector results were:

	Tight – all projects	Broad – all projects
Success rate	38%	88%
Problem project rate	59%	9%
Failure/cancellation rate	3%	3%

The key contributors to success and deliverables

The respondents from core government identified the following top six factors as contributing to project success, problems and failures. The weightings reflect the aggregate importance placed on the factors by all core government respondents.

Top six Success Factors	Weighting
Professional project management and planning	20%
Clear statement of requirements	16%
Executive management support and ownership	14%
Clear vision and objectives	11%
Competent, hard-working, focussed staff	9%
Realistic expectations/expectation management	6%

Top six Problem Factors	Weighting
Changing or escalating requirements	13%
Incomplete requirements	13%
Lack of project management/ownership	11%
Lack of resources/insufficiently skilled resources	9%
Lack of executive support	8%
Unclear objectives	6%

Top six Failure/Cancel Factors	Weighting
Lack of project ownership/management	15%
Incomplete requirements	14%
Lack of executive support	13%
Changing and/or escalating requirements	10%
Unclear objectives	6%
Unrealistic timeframes	6%

Comparing the New Zealand public sector with the private sector

The same approach was used to analyse the results of the private sector IT projects reviewed. The comparative results were:

Success Rate	Tight – all projects	Broad - all projects
Government	38%	88%
Non-core public sector	38%	83%
Private sector	31%	82%

How New Zealand IT project performance compares internationally

	Revised US (Standish) findings	New Zealand study (development projects only)
Success rate – all projects	36%	32%
Problem project rate – all projects	64%	66%
Success rate – government projects	25%	30%

Using the “tight” criteria, New Zealand organisations as a whole recorded success rates broadly similar to those reported by Standish for the United States.

Opportunities to Improve Outcomes

The main lessons arising from the research were:

- Project risk increases with project size and duration, so special attention needs to be paid to major projects.
- Project management skills are essential to the conduct of complex IT projects.
- Risk of failure increases with the extent of development activity.
- In almost all cases it is good strategy to avoid using leading-edge but untried technology.

3. LESSONS LEARNED

There have been a number of documented project successes and failures in New Zealand over recent years from which to draw lessons and recommendations. This section summarises the more comprehensive list provided in Appendix B.

As most of the lessons have general application, they are grouped into categories familiar to IT project management, and listed below to provide context to their circumstances. The index characters (*e.g.* B.4) represent the relevant section in Appendix B.

Technology and Architecture (B.1)

Key issues impacting on technology and architecture were:

- Use of emerging technology, and that unproven in the planned environment.
- The application development was not broken down into a number of discrete business deliverables. Unable to measure project progress and baselines continually changed.

- No sound process to verify the proposed technical solution was deliverable and would meet the business requirements. Caused significant delays whilst a deliverable solution was sought.
- The proposed technical infrastructure met the requirements of the new application but within a very short period of time did not meet the requirements of the wider organisation. The resulting changes caused significant project delays and costs.
- Significant technology advancements took place in the industry during the project placing significant pressure on the project to change its technical direction.
- No business and technical blueprint at the beginning of the project led to change management and systems integration problems.

Governance and Management (B.2)

Governance and management has been the greatest contributor to project failure. Some of the issues to arise were:

- Lack of sound governance and management structures led to a loss of support from a large section of the business, significant risks were not quickly addressed, the project manager felt isolated and the monitoring agencies were not receiving balanced reporting.
- The chief executive didn't have strong links with the project. This caused continual resourcing issues, poor risk management processes and lack of support from the business.
- An inexperienced project manager appointed to run a large complex project. Too many problems arose from this project to list here, suffice to say there were significant cost overruns and most business deliverables were not met. The cost of a good project manager is insignificant compared with the losses incurred from a failed project.
- Expert advice is sought for a number of reasons. There were occasions where the expert's terms of reference were poorly drafted causing key areas for review to be omitted from their report. Also the reports were either presented or interpreted too positively. This led to poor decision making and major risks were not addressed adequately.

Risk Management Process (B.3)

The key findings with relevance to risk management were:

- Typically, the risks in a major IT project are very high both because of its complexity and also because the context of rapidly developing technology leads to a high degree of uncertainty. Without a pervasive and thorough quality management and risk management policies at all levels, there is a high likelihood of under-performance if not outright failure.
- It is imperative that a business case addresses all relevant issues to enable a sound business decision to be made. Business forecasts and financial estimates are worthless unless they are based on sound and well understood technical and operational plans.
- One of the major functions of a contract is to specify and manage risk. It specifies how risks are distributed between the parties. It follows that if this role is not well understood, and if the nature of the risks is not clear, then there will be trouble, particularly if the risks are later perceived to be unfairly distributed.

A number of lessons arise from viewing the failure of a project to fully achieve its objectives from the point of view of risk indicators. The main lesson is that indicators of potential trouble and increased risk are there to be seen well before difficulties arise. Priority must be given to looking for such indicators, and if they are found, then prompt action must be taken.

Change Control (B.4)

Change control is normally a well understood process. An unusual problem arose in one project where the issue was due to the level of inscope change. The project had difficulty holding to a plan primarily because a business process re-engineering (BPR) sub project was generating a large number of 'minor' inscope changes for the application developers.

Project Formation (B.5)

Care needs to be taken in the strategic formation of a large IT project. This includes the initial research, business case, RFI/RFP process, identifying the key risks, methodology to test the business proposal and supporting technology, governance structures and appointment of key personnel.

One approach to address technology concerns is to carryout a 'proof of concept' exercise. A proof of concept should be completed prior to any technology commitment, in an environment capable of saying 'No Go' without loss of face or credibility.

The Contract (B.7)

For large IT projects provision should be made for a Contracts Manager to regularly verify both parties are conforming to the contract. The Contracts Manager should be a legal expert reporting to the sponsor, not necessarily a full time role.

Some recent lessons:

1. The contract should be used to define where risks will fall – purchaser verses supplier. For example, a fixed or capped priced contract places most of the risk on the supplier. However if the price has been seriously underestimated there is a real likelihood the supplier will make a commercial decision to walk away from the project.
2. Many provisions in a contract maybe designed to provide flexibility, however unless there is a common understanding between the supplier and purchaser over the life of the project significant problems can arise. As an example, a contract provided for technology substitution to future proof the project delivery. With a change of key personnel, the provision was used for a range of reasons other than future proofing leading to significant change control problems, delays and cost overruns.
3. Changes to the project deliverables should always be checked against the contract to ensure they do not impact warranties and end to end guarantees. Technology changed from that defined in the contract may relieve the supplier from warranties and performance guarantees.

Project Implementation (B.8)

Some lessons within this phase of the project were:

- There is interaction between the business changes and technology associated with a major IT project. The business changes should drive the technology and not vice versa. If business process re-engineering is not carried out till after the technical solution has become fixed (normally at the latest at the time of the signing of the contract), there is an increased risk that technology will drive the business changes. There can then be an underground function creep that is hard for management to detect.
- For a major IT project to be successful it must be adequately resourced, particularly in terms of skilled and experienced personnel, and governance and management at all levels.
- Many major IT projects are likely to be subjected to pressure from many sources. Governance and management should be aware of and guard against negative aspects of pressure.

4. FUTURE PLANS

We are now seeing benefits arising from the approaches the monitoring agencies are taking *e.g.* recognising and taking corrective action where risks have risen to a prohibitive level, and better understanding and communication of risk to Government. However the approaches tend to fall into the reactive category. There is significant potential benefit to be gained (improving the 38% success rate) by augmenting current monitoring practices with more pro-active initiatives.

A key imperative to be taken into account when addressing pro-active initiatives, is to ensure CEs continue to be fully accountable for the successful completion of major IT projects. The initiatives should strengthen the agency's ability to attain a successful outcome, not take over their responsibilities. Potential avenues to achieve this are to:

- Establish and publish standards that should apply to major IT projects *e.g.* risk management, project management methodology and selection criteria;
- Improve the knowledge of those participating in projects. The 'Governance and Oversight of Major Information Technology Projects' report by the Controller and Auditor-General is a good example of this approach;
- Provide the means to communicate best practice; and
- Provide advisory services where appropriate.

There are examples where other countries have made significant progress down these paths including the provision of online support facilities. New Zealand does not wish to 'recreate the wheel' and plans to take on board the experiences of these overseas initiatives.

As many of the issues arising from IT projects are common to the public and private sectors, there is potential to improve the management of projects through the co-operation of both sectors. An initiative to explore ways for this to happen should be considered.

5. LITERATURE, WWW, AND STUDIES

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**APPENDIX A
BUSINESS CASE CHECK LIST**

Overview Questions	Comments
Does the sound business case comply with Cabinet criteria (refer to Annex 3 to CO(98)17)?	
Are there technical issues that need to be resolved prior to consideration by Cabinet Committees and/or Budget Ministers?	
How ready would the proposal be to proceed if approved, and would alternative timings be viable or preferable? What impact would timing changes have on investment and baseline implications?	
Will the project assist the department in achieving its strategic goals?	
Do these strategic goals contribute to Government policy or the Key Government goals?	
Have possible alternatives been identified, and how do these compare?	
Is the investment in the department appropriate to the likely projected outputs to be purchased? Is the level and mix of assets appropriate?	
Are other votes/departments affected by the project?	
How is the collective interest affected? <i>e.g.</i> Where there are multiple users of a facility and one withdraws, the costs to those remaining may increase.	
Is the capital expenditure greater than \$7 million? Have Cabinet delegation procedures been followed in accordance with CO(99) 7?	

Questions on the estimation of costs and benefits	Comments
How strong is the business case (<i>e.g.</i> are there net benefits to proceeding, how robust are these, what is the financial return to the Crown)?	
How have the project costs been estimated? Can the department substantiate the robustness of the cost estimates and assumptions supporting them?	
Have people actually involved in the management of the project been involved in the estimation of the costs?	
Does the business case set out the total cost of the project, including non-cash items such as depreciation?	
Does it detail the assumptions made in discounting future cash flows (<i>e.g.</i> real or nominal cash flows and discount rate)?	
Does the project result in any social costs or benefits outside the department?	
If the estimated costs and/or benefits do affect other votes/departments, have they signed up to the costs/benefits?	
<p>Where internal staff costs are involved:</p> <ul style="list-style-type: none"> · Do the project costs include additional costs for internal personnel above normal operating costs? How many staff are required? · Are these reasonable? What comparisons or benchmarks are available to support these? · What happens to staff surplus to requirements following the implementation of the project? · Have redundancy costs, if applicable, been included? Does the timing align with the project milestones? 	
<p>Where consultant costs are involved:</p> <ul style="list-style-type: none"> · What comprises these costs? Are these costs likely to change during the course of the project? · Is it more cost-effective to utilise the department's own staff? Do internal staff have the appropriate skills? <p>Does the report justify the use of consultants and identify the risks of using consultants or internal staff?</p>	
Will the project lead to the avoidance of any costs? (These costs should be quantified and included in the analysis as benefits.)	
Will the project lead to increased or decreased business compliance costs, in terms of the requirements of the department acting in its own right and acting as agents for other Government departments? Has the department established appropriate mechanisms to meet these requirements?	
How have the benefits been estimated? Has the department broken the estimates into separate categories of benefit, <i>e.g.</i> operating efficiencies, decreases in corporate overhead, etc.?	
Are salvage values for assets at the end of the project accounted for?	
What is the impact on the price of outputs? For example, is there a trade-off between quantity and quality; price and quantity (increased prices may lead to lower demand)?	
Is the change in the price of outputs directly related to the project? (Are there extraneous variables?)	
Are the assumptions made in the benefit estimation realistic?	
Does the project result in any intangible benefits? Have these been detailed in the business case?	
Are NPV calculations included in the proposal?	
Could the timing of the costs and benefits change? Have different timing options for receipts and payments been explored?	

Projects that have positive *ex ante* NPVs sometimes fail because the actual costs are much greater than estimated, or the benefits or savings are not realised, or both. In many cases, the difference between *ex ante* estimates and the *ex post* realisation can be attributed to poor project management and implementation.

Questions on the control of the costs and the realisation of benefits:	Comments
Does the department have a formal project management structure for the project? Is there a Project Sponsor; Steering committee; Project managers? Are the roles and responsibilities of each of these clearly established?	
Does the department have the requisite expertise to oversee the successful implementation of the project?	
To what extent have relevant risks (either of proceeding or not proceeding with the proposal) been adequately identified?	
How will changes to the scope and scale of the project be approved?	
How will the actual project costs and benefits be tracked? Have appropriate milestones been developed? Will individual managers be held responsible for controlling costs and realising benefits?	
How frequently will reporting be? What will be covered in the reports? Who will receive the reports? Are these included in the recommendations to OCEC? Note that for IT projects, reporting requirements are set out in CAB(99)M24/6B - have these been followed?	
Is there an independent post-implementation review?	

Questions on the financing of the project	Comments
Is the department seeking an additional capital contribution from the Crown?	
<p>Are there alternative financing options that would avoid the need to draw on constrained Government capital funding <i>e.g.</i> financing from within baseline or from reprioritising the department's existing capital programme? Does the business case consider the pros and cons of alternatives for funding <i>part</i> of the project from within the current baseline?</p> <p>Note that additional capital from the Crown as owner should be the last resort for capital expenditure or working capital injections. The entity needs to show that other financing options such as accumulated depreciation and cash and asset sales are not available.</p>	

APPENDIX B

LESSONS LEARNED AND RECOMMENDATIONS

This list is not exhaustive, but includes issues experienced throughout the life of a number of large IT projects in New Zealand.

- B.1. Technology and Architecture
- B.2. Governance and Management
- B.3. Risk Management Process
- B.4. Change Control
- B.5. Project Formation
- B.6. Project Approval
- B.7. The Contract
- B.8. Project Implementation
- B.9. Approval and Monitoring Regimes

B.1. Technology and Architecture

Proposed Solution

Lesson	Recommendation
The project sought to achieve its objectives by implementing technology and architecture unproven in terms of size, complexity and geographical distribution.	Normally it is desirable to use proven technology. Where it is necessary to depart from this, a New Technology Testing programme (<i>e.g.</i> proof of concept) should be completed prior to contract and the CE and monitoring agencies should be satisfied that the technologies will deliver the business benefits.
Major IT projects will normally change the technical infrastructure and applications. The two are separate, though complementary, and should be dealt with as such. The bundling of applications and IT infrastructure into a single contract for a major IT project will significantly increase the project's complexity which will, in turn, increase the risk of serious problems.	For major IT projects, the IT infrastructure should preferably be "unbundled" from the applications and, where possible, the applications should be modularised into discrete business deliverables.

Core Architecture

The extensive changes to core architecture, whilst a major application development is in progress, will adversely affect the project.	Core architecture should not be changed unless absolutely necessary. Any changes should be in strict compliance with change control, be referenced to the business case and be reported by the Project Manager and to the Monitoring agencies. Where possible, changes should be delayed until after the application development has been completed.
The rate of change of technology over the life of the project can create significant pressures on project governance.	The life of the project should normally be limited to no more than one year. Any project of greater length needs to be broken down into a number of modules and predefined points where decisions can be made to modify technology to meet the new requirements.

New Technology Testing

A contract requirement for emerging or unproven technology brings high risk. The normal approach would be to complete a New Technology Testing programme <i>e.g.</i> proof of concept. In the absence of New Technology Testing, the risk is usually prohibitive.	Emerging or unproven technologies should be subject to New Technology Testing, and used only after careful assessment of risk.
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Blueprint

Without a blueprint at an early stage, a major IT project will lack the essential and integrating focus required for guiding the detailed design, development and change process.	Any major IT project should develop an effective blueprint prior to application design.
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Technology Substitution

<p>A technology substitution regime should not be used in place of a sound technical solution at the outset.</p> <p>A technology substitution provision in a contract is in principle an appropriate approach, as it is a means of giving some of the technical flexibility necessary for a major IT project. There are other ways of providing flexibility, however, such as in the form of the contract itself. A danger inherent in a technology substitution provision is that it is open to misuse. It cannot be used as a means of making up for shortcomings in the contract, such as the lack of a clear technical specification, and its use as a mechanism for changing major technical components of the solution will lead to increased delay and risk.</p>	Major IT projects should have sound technical solutions at the time of contract and any technology substitution should be limited to substitution of items or components within the existing technical solution. Technology substitution provisions should not be used as a primary means of managing a contract.
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Role of Systems Integration

Systems Integration for major IT projects is a skilled operation, normally requiring specialist advice.	Major IT project should normally engage a systems integration specialist.
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B.2. Governance and Management

Governance and Management of the Project

Good governance and management structures, and experienced and skilled personnel are essential for the success of a major IT project, at the commencement and throughout the project.	Government and government agencies should ensure that major IT projects have sound organisation structure, adequate resources, and experienced and skilled personnel for project governance and management.
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Chief Executive

<p>Projects are likely to suffer without CE attention to governance and management.</p>	<p>The Chief Executive should oversee the governance and management of a major IT project by:</p> <ul style="list-style-type: none"> Ensuring acceptance and continued commitment by the whole of the organisation to the project. Ensuring the project and business case support the overall strategy of the organisation. Ensuring adequate resourcing. Appointing a qualified Project Sponsor. Being fully briefed, at least monthly, on progress, major risks and resourcing issues. Receiving and acting on relevant reports and information. Ensuring achievement of objectives. <p>The CE should be aware of and resolve any serious dispute between senior project personnel that impacts adversely on the project.</p>
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Project Sponsor

<p>The primary responsibility for the appointment of the Project Manager rests with the Sponsor. The appointment by the Sponsor of a Project Manager lacking the appropriate skills and experience carries high risk.</p> <p>The Project Manager should report to the Sponsor and departure from this carries increased risk.</p> <p>Failure by the Sponsor to ensure good relationships amongst senior personnel can be detrimental to the project.</p> <p>Lack of commitment of all personnel in the business can be detrimental to the success of the project.</p>	<p>The Sponsor should be either the CE or a senior executive manager.</p> <p>Sponsors should appoint a Project Manager who has the necessary project management skills and experience.</p> <p>The Project Manager should report to the Sponsor.</p> <p>The Sponsor should address and resolve any unsatisfactory relationship between senior personnel immediately.</p> <p>The Sponsor should continually reinforce commitment to the project by the entire staff.</p>
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Project Managers and CIO

The success of a major IT project is critically dependent on the skills and experience of the Project Manager. For a large complex project it is more important to get good IT project management skills than to appoint an unskilled Project Manager from within the organisation.	The person appointed as Project Manager should have the appropriate skills and experience in management of major IT projects.
Difficulties can arise in a major IT project if there is an inappropriate reporting structure. There are likely to be problems where Project Managers are not reporting directly to the Project Sponsor, for example, reporting to a line manager.	The Project Manager should report directly to the Sponsor.
There are serious risks to a project if proper procedures are not followed in the appointment of key personnel.	Governance and management should follow proper procedures, <i>i.e.</i> a “from the top down” process, in relation to the appointment of key personnel.
Serious disagreements between or within governance or management of a project can be detrimental to its success.	Governance and management should be aware of the potential for conflict in human relationships, and take action to avoid this. Where a serious dispute arises, governance or management need to address and resolve the dispute promptly.
Poor or inadequate reporting inhibits proper governance and management and is prejudicial to the efficient operation of the project.	In order to perform their functions, government and management must enforce timely, full and frank reporting at all levels and in particular by the PM, independent QA and audit. Any departure from that should be heeded by governance, management and monitoring agencies.

Steering Committee

The lack of an effective Steering Committee as part of the project governance and management structure is detrimental to a project.	It is essential that all major IT Projects have an effective Steering Committee. The membership should include senior line management. Monitoring agencies should insist on a Steering Committee, and attend, or receive minutes of, meetings.
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Baselines and Milestones

Proper baselines and milestones need to be established to enable effective management and monitoring.	Cabinet ministers and monitoring agencies should require that proper baselines and milestones are indicated in the business case, and that material changes be referenced to the business case and reported to the monitoring agencies. Reports on project progress should reference the original business case baselines.
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Project Managers' Reports

The lack of timely and comprehensive PM reports is detrimental to the project and to monitoring.	PM reports need to be at least monthly, address key risks, and be concise, focused and properly reflect the current project status.
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Culture

<p>The culture of an organisation can have a detrimental impact on the ability of a major IT project to perform and deliver its objectives.</p>	<p>Governance and management needs to be aware of the adverse impacts culture may have on major IT projects.</p> <p>Monitoring agencies should also be aware of the problems that might arise if a major IT project is being managed within a culture likely to impact adversely on the project deliverables.</p>
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Experts' Reports

<p>There are many occasions when outside experts must be asked to review and report on aspects of a major IT project. However, the effectiveness of the process can be reduced for a number of reasons.</p> <ul style="list-style-type: none"> • Difficulties can arise if the terms of reference are not clearly defined. • The report may be deficient in some way and not deal adequately with the issues it addresses. • At times, reservations and negative comments in the body of the report are missing from or downplayed in the report's executive summary. • Selective quotation from an expert's report can give a very wrong impression of its findings. <p>A report can be used as a substitute for action. Reservations and negative findings in a report by outside experts often appear to be ignored or downplayed.</p>	<p>Agencies, when considering an expert's report, should:</p> <ul style="list-style-type: none"> • Check the terms of reference of the report; • Assure themselves of the adequacy of the report, use a peer review if needed; and • Consider the whole of the report, particularly any reservations and negative comments. <p>Management needs to be sure that an expert's report is adequate, accurate and balanced, and should look out for any indicators to the contrary.</p>
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Approved Quality Management and Warnings not Heeded

<p>Major problems in a major IT project do not arise suddenly. There are always warnings of trouble and indicators that all is not well. If these are sought, seen and dealt with promptly, the risks to a project can be reduced and problems averted. On the other hand, not heeding warnings and hoping optimistically that all will be well is a sure path to disaster.</p>	<p>Throughout major Government IT projects, policies and practices should be adopted that encourage an awareness of the need to notice and, where appropriate, take immediate action on warnings and indicators of trouble.</p> <p>Monitoring agencies should be alert to any departure from this requirement and should pay particular attention to how, and how promptly, issues are resolved.</p>
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B.3. Risk Management Process

General

Typically, the risks in a major IT project are very high, both because of its complexity and because the context of rapidly developing technology leads to a high degree of uncertainty. Without pervasive and thorough quality management and risk management policies at all levels, there is a high likelihood of underperformance, if not outright failure.	Major IT projects should have comprehensive formal quality management and risk management processes that are fully integrated into all aspects of project management. All personnel should be aware of risk, and of the risk consequences of all their decisions and actions. Monitoring agencies should monitor the observance of and adherence to the formal risk management process.
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System Complexity

Highly complex processes are difficult to manage successfully. They require special systems-related skills. The unexpected and often unpredictable interactions within complex systems leads to counterintuitive consequences and to high uncertainty and risk.	Major and complex IT projects should ensure that they have special systems skills available to their management.
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Risk Manager

It is difficult to manage the risk within a major IT project and to adhere to a formal risk management process without a Risk Manager, whose role should be to ensure the presence and continuing health of the risk management process.	Major IT projects should have a Risk Manager.
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Governance

Major IT projects are particularly vulnerable to increases in complexity and uncertainty arising from lack of a clear and central integration and focus. Too frequent changes of technology and direction will also increase the risk.	Major IT projects must have tight management and control.
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Reporting

A major IT project requires full and frank reporting of both positive and negative information and assessment. Where problems and issues are known but information about them is not distributed either within governance and management, or to monitoring bodies, serious trouble can be expected.	The reporting mechanisms, communication channels and culture in major IT projects must both allow and encourage full dissemination of all relevant information, no matter how unpalatable it may be.
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Business Case

It is imperative that business cases address all relevant issues to enable a sound business decision to be made. Business forecasts and financial estimates are worthless unless they are based on sound and well-understood technical and operational plans.	Cabinet should prescribe a comprehensive specification for all the aspects to be addressed in a business case. These should include assurance of and evidence for the soundness of the technical and operational solutions underlying the business forecasts and financial estimates. The forecasts and financial estimates should address risk by including estimates of uncertainty. Government and monitoring agencies should ensure that these aspects are covered effectively.
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Contract

<p>One of the major functions of a contract is to specify and manage risk. It specifies how risks are distributed between the parties. It follows that if this role is not well understood, and if the nature of the risks is not clear, then there will be difficulties, particularly if the risks are later perceived to be unfairly distributed.</p>	<p>In a major IT project, risk and risk management matters should be specifically addressed before a contract is signed.</p> <p>Flexible forms of contract should be used for major IT projects.</p> <p>If there is material change in risk from those identified in the business case, the change should be referenced to the business case and be reported, including a report to the Monitoring agencies.</p> <p>Government agencies contracting out major IT projects should monitor risk control mechanisms within the contract.</p> <p>Government agencies should not sign a contract for a major IT project without first being assured that the risks inherent in the project are:</p> <ul style="list-style-type: none"> · Well understood. · At an acceptable level. · Capable of management in accordance with the risks identified in a business case. · Fairly distributed between the parties.
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Communication

<p>Good communication is essential in a complex project. Good communication is clear, complete, balanced and accurate. Furthermore, it is a two-way process.</p>	<p>The governance and management of a large and complex project should ensure that good communication is in place.</p> <p>Reports must also be written in clear language and be delivered on time.</p>
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Role of Advisers

<p>Independent expert advice is particularly important in projects with a high degree of complexity and with a major technological component. Two things follow: that the advice is certified to be sound, and that it is acted upon appropriately.</p>	<p>The management of large and complex IT projects, and monitoring agencies involved with the approval and oversight of them, should seek independent expert advice where appropriate.</p> <p>A peer review or second opinion on expert advice should normally be sought where there is doubt, or where the issues are critical.</p> <p>Project management must deal promptly and thoroughly with issues raised by independent advisers.</p> <p>Expert advisers must make every effort to ensure the advice contained in their reports is sound, and that their reporting of it is clear and balanced.</p>
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Risk Indicators

<p>A number of lessons arise from viewing the failure of projects to achieve its objectives fully from the point of view of risk indicators. The main lesson is that indicators of potential trouble and increased risk are there to be seen well before difficulties arise. Priority must be given to looking for such indicators, and if they are found, prompt action must be taken. More detailed lessons are:</p> <ul style="list-style-type: none"> • Pressure on a project to succeed can arise from a number of quarters. A high degree of pressure can lead to increased risk. • New technology can bring high risk to a project. • Management inexperience leads to increased risk. • Major organisational change brings high risk. • Human relationship difficulties in a complex project lead to increased risk. • The complexity inherent in major IT projects leads to increased risk. • Inexperience and inappropriate technical skills in a major IT project bring with them increased risks. 	<p>Priority must be given to looking for risk indicators. If they are found, management must take prompt action.</p> <p>Management must be aware of the danger that pressure on and within a project can lead to increased risk. It must therefore watch for symptoms of high pressure and take steps to deal with its sources, which can be many. Where this is not possible, care must be taken with other aspects of the management of risk.</p> <p>New or emerging technology should be avoided wherever possible. Where it is adopted, the high risk it brings must be managed. Wherever possible, proven technology and off-the-shelf packages should be used for major IT projects.</p> <p>High priority must be given to the risk management of major organisational change.</p> <p>Because complex projects bring high risk, complexity should be reduced wherever possible.</p> <p>Human relationship difficulties in a complex project must be dealt with promptly.</p> <p>Because risk management and quality management are closely related, where there is high risk there must be thorough quality management.</p> <p>Large and complex IT projects must have management with particular skills for dealing with complex systems.</p> <p>The increased risks brought to a major IT project by inexperience and inappropriate technical skills must be appropriately managed by bringing in external reviews and other means.</p>
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Project Manager

<p>A PM's reports to the project sponsor, independent QA, auditors and oversight bodies provide a major means by which the health of the project can be assessed. It follows that where there are deficiencies in the reports, particularly with regard to project risk, the consequences can be serious. However, it is generally the case that deficiencies in the reporting process are indirectly signalled for all to see by, for instance, a lack of timeliness or a failure to report on risks.</p>	<p>It is essential that a PM give full and timely reports, particularly with regard to project risk.</p> <p>Monitoring agencies and others overseeing major projects should ensure there is comprehensive reporting of risk by the PM.</p>
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B.4. Change Control

Change Control

<p>An effective change control process is essential for a large complex project. The process should reflect changes to the project budget and impacts on the business case.</p> <p>The process should record both change out of scope as well as change within scope.</p>	<p>The governance and management of major IT projects should put in place and enforce a proper change control process. Monitoring agencies, as part of their duties, should confirm that a proper change control process is in place and being observed.</p> <p>The impact of changes should also be reflected in the project budget and on the business case.</p>
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B.5. Project Formation

Project Development (RFI, RFT and RFP)⁹

<p>Unless care is taken in the strategic formation of a major IT project, risks can be increased and this was apparent in the project by the adoption of a fixed or capped price contract for the whole of the project including infrastructure and application development.</p>	<p>The CE should ensure that there are adequate resources for the consideration of strategic formation and that decisions in accordance with generally accepted practice are made on relevant issues including the nature and type of the contracts for infrastructure and applications. A fixed or capped price contract for the whole of a major IT Project should normally be avoided.</p>
<p>The RFT and RFP should not have had such an emphasis on the technical solution and in particular on unproven technology and architecture.</p>	<p>In major IT projects the tender documents should normally specify the business objectives, state a preference for proven technology, state any conditions regarding already installed technology, and require the tenderer to specify the technical solution.</p> <p>Today the inquiry would recommend obtaining the maximum flexibility through an open system. A major IT project should have a blueprint and a proof of concept.</p>

Role of Advisers

<p>The lack of a peer review just prior to contract meant increased risk to the project. This was particularly so given the complexity of the project and the unproven technology proposed.</p>	<p>Normally the CE and the monitoring agencies should require an independent peer review of the project and the proposed contract before proceeding to contract.</p>
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Proof of Concept

<p>The lack of a proof of concept results in increased risks and this is particularly so where unproven technology or architecture are proposed.</p>	<p>Major IT projects should perform a proof of concept before contract, particularly where unproven technology is proposed or when the credentials of the supplier are in doubt.</p>
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9. Request for Information, Request for Tender and Request for Proposal.

Business Process Re-engineering (BPR)

BPR should be completed or substantially completed prior to contract or application development, as the information from BPR is necessary to define the scope of the contract. If this is not done, subsequent variations to the contract are inevitable.	A failure to complete or substantially complete BPR prior to contract is usually detrimental to the Pproject and carries a risk that the BPR will result in an increase in scope not provided for in the contract.
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B.6. Project Approval

General and Business Case

Operational and financial risk attending a proposed project must be included in an application for project funding and approval, and the technical and functional soundness of the proposal should also be established. Otherwise, a project should not be approved.	<p>Cabinet should specify the components required for a sound business case so that operational, technical and financial information supporting this is disclosed.</p> <p>The CE is responsible for the preparation of the business case and should approve and sign it to acknowledge that responsibility.</p> <p>Cabinet should be assured by the monitoring agencies that a proposed project is technically, functionally and financially sound.</p>
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Role of Advisers

<p>The terms of reference of an expert adviser need to be carefully defined and carefully considered by any person relying on advice. This person should:</p> <ul style="list-style-type: none"> • Check that the advice is timely and accurate. • Study the whole of the advice and not just an executive summary. 	The terms of reference of experts, the timeliness and applicability of advice, and the advice of an expert included in an application for approval should be critically reviewed in full by monitoring agencies, and any uncertainties or contradictions resolved.
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The Role of Monitoring Agencies

Unless the actions of the monitoring agencies are effective, Cabinet may be requested to approve a major IT project without having reliable information.	The monitoring agencies should be sufficiently resourced, skilled and experienced to advise Cabinet effectively on major IT Projects.
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Financial Return

The focus on financial return and government participation can cause a distortion to the application to Cabinet for approval for the project	<p>Government should specify that non-financial matters can properly be put forward in support of an application and give them due weight.</p> <p>Government should require an explicit assessment of the uncertainty underlying financial estimates put forward in applications for funding.</p>
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Application as a Whole

Any application for funding is likely to be couched in the most favourable terms possible. It will therefore contain a certain degree of bias and distortion. Care needs to be taken to detect any unduly favourable presentation.	Monitoring agencies should be aware of any tendency to present an application in an overly favourable way, and should adopt a critical appraisal.
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B.7. The Contract

Form of Contract

A fixed price contract for the whole of a major IT project has a high level of risk; a more flexible form should be used, requiring delivery in stages.	A flexible form of contract or contracts should be used for major IT projects, normally with separate contracts for infrastructure and applications, with delivery in modules of business benefits and infrastructure, and in time for delivery of applications.
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Off-Ramp and Lay-By

Off-ramp and lay-by provisions are important means of risk control. When in a contract, they must not be overlooked and instead be kept under proper assessment.	Governance, management and monitoring agencies should require that procedures are in place to ensure that critical issues such as the contract off-ramp are properly assessed.
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Time Not of Essence

In a major IT project where time of delivery is always critical and delays are costly, time should be of the essence.	The CE should not agree to a contract in which time is not of the essence unless the time issue is specifically addressed and there are compelling reasons for taking such a course
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Warranties

The warranties and end-to-end guarantees in a contract are an important means of risk control. Therefore any decision that affects warranties or guarantees needs to be carefully assessed in relation to the risks of the project.	In major IT projects any decision that affects warranties or guarantees should be carefully assessed by the Project Sponsor, Project Manager and Contract Manager in relation to risks of the project.
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Technology Substitution

<p>A provision for technology substitution in a contract can be worthwhile. However, it is not a surrogate for having a sound technology solution in place.</p> <p>There are risks if the effect of a technology substitution clause is perceived to be wider than a correct interpretation of the clause.</p>	<p>Care needs to be taken in interpreting and assessing the effect of a technology substitution clause. It should not be used beyond its scope nor as a surrogate for a sound technology solution.</p> <p>Significant technology substitution should be avoided whilst the application is being developed.</p>
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B.8. Project Implementation

Business Process Re-engineering (BPR)

There is an interaction between the business changes and technology associated with a major IT project. The business changes should drive the technology and not vice versa. If BPR is not carried out until after the technical solution has become fixed (normally, at the latest, at the time of signing the contract), there is an increased risk that technology will drive the business changes. There can then be an underground function “creep” that is hard for management to detect.	<p>In major Government IT projects BPR should be completed or substantially completed prior to contract in order to stabilise the level of change impacting on application design and development.</p> <p>Furthermore, during the course of a BPR, every effort should be made to ensure thorough acceptance and buy-in throughout the organisation of the whole project, including both organisational and technical changes.</p>
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Project Charter

<p>A project charter is the project's management and governance "glue". Without a charter, or where the contents are spread over a number of documents and not maintained throughout the life of the project to reflect change (especially when the project lasts longer than one year), there is a high risk of the governance and management of the project becoming unstuck.</p>	<p>A project charter should be completed and agreed to by all the major stakeholders, including the monitoring agencies, immediately following project initiation. The charter should be maintained throughout the life of the project. The charter should be readily accessible to all interested parties.</p>
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Personnel and Resource Issues

<p>For a major IT project to be successful it must be adequately resourced, particularly in terms of skilled and experienced personnel, and governance and management at all levels.</p>	<p>In large and complex government IT projects, there should be appropriate resourcing of skilled and experienced personnel at governance and management levels, and monitoring agencies should monitor the proposed and actual resourcing throughout the life of the project.</p>
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Pressure

<p>Many major IT projects are likely to be subjected to pressure from many sources.</p>	<p>Governance and management should be aware of and guard against negative aspects of pressure.</p>
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B.9. Approval and Monitoring Regimes

General

<p>Annual accounts and reports to Parliament will not, under GAAP, disclose contingent liabilities in respect of contracts for major IT projects unless special risks are identified.</p>	<p>Government agencies and their auditors should ensure that there is inquiry and investigation of the issue of special risks in relation to major IT projects and that any special risk is reported in the annual accounts and reports.</p>
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Approval and Monitoring Regimes

<p>The approval and monitoring regimes (until a late stage) in the project did not provide sufficient information on which Cabinet and ministers could base decisions.</p>	<p>The approval and monitoring regimes should be made more robust by:</p> <ul style="list-style-type: none">Cabinet and ministers specifying the requirements for an application and attaching directions to any approval.The monitoring agencies having sufficient resources to participate effectively in the approval and monitoring regimes.
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Use of Experts

<p>In the approval and monitoring regimes, care needs to be taken in the instruction and use of experts and the assessment of their reports. Failure to do so can lead to adverse consequences for government and the project.</p>	<p>Monitoring agencies should develop skills in instructing and using experts and the assessment of their reports.</p>
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Improvements to Monitoring

<p>Defects in the business case and lack of proper baselines, milestones and measurements inhibit or preclude effective monitoring. Likewise, the lack of an effective change control process can result in material changes or de-functioning not being properly recorded or reported, to the detriment of effective monitoring.</p>	<p>Cabinet, ministers and the monitoring agencies should require a proper business case, baselines and milestones that provide a base from which effective monitoring can be performed. Monitoring agencies should identify specific measurements and reporting they require from the project and independent QA. Likewise, there should be a direction that in the event of an effective change control process be implemented, and that any material change or de-functioning be referenced to the business case and be reported to the Monitoring agencies.</p>
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