CONTINGENCY VERSUS MANAGEMENT RESERVE

Dr Raphael M. Dua
F.A.I.C.D., M.A.I.P.M., M.A.C.S.,
CEO and Owner
Micro Planning International Australia
CONTINGENCY versus MANAGEMENT RESERVE

Table of Contents

1. CONTINGENCY VERSUS MANAGEMENT RESERVE ........................................... 3
   1.1 Introduction ............................................................................................ 3
2. CONTINGENCY IN INFORMATION TECHNOLOGY PROJECTS ................... 4
3. CONTINGENCY VERSUS MANAGEMENT RESERVE .................................... 4
4. TYPES OF CONTINGENCY .......................................................................... 5
5. ESTIMATING CONTINGENCY ....................................................................... 5
6. THE PERFORMANCE MEASUREMENT BASELINE AND MANAGEMENT RESERVE ...................................................................................................................... 7
7. WITHIN THE PERFORMANCE MEASUREMENT BASELINE PLANNING FOR CONTINGENCY ............................................................................................................ 7
8. WHERE TO LOCATE CONTINGENCY BUDGETS ........................................... 8
9. CONCLUSION ............................................................................................... 9

Copyright notice

Copyright © 2000 Prophecy Solutions Pty Ltd trading as Micro Planning International Australia. Copyright 1997 Micro Planning International Pty Ltd

This document is copyright. Other than for the purpose of and subject to the conditions prescribed under the Copyright Act, no part of this document may in any form or by any means be reproduced, stored in a retrieval system or transmitted without prior written permission from Prophecy Solutions Pty Ltd.

X-Pert™ is a registered trademark of Prophecy Solutions Pty Ltd.

On occasions, excerpts from proprietary material accessible under licence agreement may be included in this documentation. In that case such information may not be reproduced without the express permission of the proprietor

On occasions, trademarked names are used and rather than put a trademark symbol in every occurrence of a trademarked name, we are using the names only in an editorial fashion and to the benefit of the trademark owner, with no intention of infringing of the trademark. All trademarks are the property of their respective owners.

Working Papers

Our working papers presents the author’s thinking on project management issues. We encourage your feedback on the ideas provided in this paper to the author.
1. Contingency versus Management Reserve

1.1 Introduction

In any project, which has been predicated on the Earned Value Management Performance method (that is the C/SCSC criteria), there is always an issue concerning contingency and where it properly belongs. The general use of CS squared criteria tends to indicate that Management Reserve (MR) and contingency are roughly one and the same thing. However in the United States the Department of Environment (an enthusiastic user of the criteria) states in its project management policy DOE Order 4700.1 that “contingency” be clearly identified and included in the Total Estimated Cost (TEC). [TEC is generally referred to as Estimate to Complete (ETC) in the DEF(AUST) 5658 ].

The need to make provision for contingency or a management reserve for Information Technology projects has always been apparent and this view has been recently (Mar ‘95) reinforced by the Standish Group International report in the United States. Their research showed that in the current fiscal year approximately $US250 billion will be spent by American business and government agencies on applications development projects. However the predictions for success are extremely low and the research showed that about a third of this ie $US83 billion will be spent on software projects that will subsequently be abandoned. To make matters worse, further predictions showed that more than fifty percent of projects will overrun their budgets by between 89 and 105%.

Furthermore only 16% of projects actually finished on time and on budget. (It is interesting to note that Microsoft claims 85% of the project management software market, is there a causal relationship between the number of failures and MS's presence in the planning arena?).

No contingency appeared to have been incorporated in many of the projects, the most common reason being given by project managers is that the client viewed the amount of budget allowed for it as “unreasonable and unwarranted”. The clients view on the other hand was that “Information Technology people and suppliers over promise and under deliver. They are always over budget and running late”. Obviously one of the major reasons for this phenomenon is the communications gap that often exists between information technology people and business people. In fact a misunderstanding between the two parties, which with proper planning and project management can be avoided.
CONTINGENCY versus MANAGEMENT RESERVE

2. Contingency in Information Technology Projects

For Information Technology projects it is argued that contingency should be visible as a cost package clearly identifiable as an element within the Contractors’ Work Breakdown Structure (CWBS) at levels where appropriate as shown in Figure 1 below. An alternate viewpoint is to define the risk inherent in an IT projects in order to be able to provide for sensible contingency budgets during the definition stage of the project. See Appendix 1 for an outline of the methodology for risk analysis.

3. Contingency versus Management Reserve

Contingency funds are controlled by the client externally to the project office, this is due to the uncertainty of the existence of a contingency, its nature, whether or not there is a likelihood of an occurrence, or even the scope and magnitude of the impact. Thus in this context, contingency is an effect which may arise from such properties as incomplete design, changes due to unforeseen circumstances, market conditions, or even the client themselves changing the scope of the project.

When estimating total project costs, contingency costs should be estimated to cope with materials, resources, market conditions, technology changes and risk situations which are an integral part of the scope of work defined in the project charter, but which are not specifically catered for anywhere else in the project financial metrics.

Management Reserve is that part of the project budget controlled by the project director within the project office, for management purposes and not assigned for the execution of any specific tasks. When it is used Management Reserve is allocated to specific cost accounts to create a budget for activities that were not envisaged when the original project charter was signed off.

At first glance contingency and management reserve appear to be for the same thing that is for unknown work scope such unknown work scope is unavoidable in any project. The distinction between them is how they are used and at what management level they are controlled and the way in which the budget has been defined.
CONTINGENCY versus MANAGEMENT RESERVE
The Australian view of Management Reserve in Def(Aust) 5657 is very similar to the US view, except that it specifically states that, “MR is not a contingency fund and may neither be eliminated from contract prices by Defence nor used to absorb the cost of contract changes.”

4. Types of Contingency

In defining the various types of contingency it is necessary to determine how the dictionary defines it and how the project director defines it in terms of the project. The “Shorter Oxford” dictionary defines contingency as “A thing dependent on an uncertain event”. Webster’s defines it as “something liable to happen as an adjunct to something else”. These definitions then cover the cost control schedule estimator’s view of contingency as well as the project manager’s view of Management Reserve. In other words the entire gamut of contingencies; schedule, business, financial, technological and industrial relations.

The disciplines that make up the cost control scheduler’s processes will establish the differences between schedule, business, financial, technological and industrial relations contingencies and the degree of risk inherent which may or may not be forecast in those areas. Thus the probability of a contingency occurring in a specific area when measured which may be so low, would not be worth including in the cost estimate. Thus the only proper way to account for it would be to include that low risk contingency in a cost package budget within the ambit of the Management Reserve.

The converse of this then is a high risk of the contingency occurring, thus the only proper course open to the cost control scheduler is to include the cost of the risk in the cost estimates. The cost of the high risk contingencies are then visible to the project manager, allowing them to monitor the particular areas which produce the most risk to the success of the project.

Invariably when the initial costs are estimated they will be only preliminary estimates and more than likely have a high degree of contingency built in due to the immaturity of the project information. As the data matures and the cost estimates become more detailed, more often than not the estimate of risk declines and so the better the cost estimate reflects what is likely to happen during the project.

Interestingly enough the Australian Department of Defence does not specifically mention contingency nor defines it in any of the Def (Aust) standards. Basically all the project work performed must be budgeted for and it must be accurately assigned to identified units of work. Thus if unforeseen circumstances occur and work which was not budgeted for has to be undertaken, then the process by which budget can be found, is to use the Authorised Unpriced Work category. Provided this work is authorised by a documented management system (ie change control), then funds from the Management Reserve can be used to provide a temporary budget. The amount of the budget change required to cater for the unforeseen work is then negotiated as a contract change to the amount of Management Reserve. The revised work is now formally identified and can be reported against. This may cause the new level of Management Reserve to be greater than the original agreed reserves. It is not likely that this change in itself would require a rebaselining of the Performance Measurement Baseline. The CSSR formats cater for these new budget costs.

5. Estimating Contingency

Just how much percentage of the cost estimate should be allowed for contingency is a matter for debate. For too many years the “lets just add 10% contingency” syndrome had always proved to be inadequate. Not unnaturally senior management has not wanted to see any contingency, it has been a political problem for as long as there has been cost estimates. A street smart project manager always added large contingency amounts knowing full well that senior management would take the knife to the project costs.
CONTINGENCY versus MANAGEMENT RESERVE

As was stated previously, in the United States the Standish report showed that in the IT project arena, 84% of all IT projects failed to make their delivery and budgeted costs. Over 50% of projects had cost overruns of between 100 and 200%, which amounted to billions of dollars. Most did not have any contingency or management reserve. Having interviewed 891 senior managers, 71% of them stated that contingencies in the region of 100% of the budgeted project cost were probably not enough. In fact a number of large and complex IT projects had overrun by 500% or more. If this is the case then these types of IT projects probably should never have been given the green light.

The Department of Energy in the US state in their Estimating Handbook, that expected contingency range in “Preliminary” estimates is 30 to 70% of the Estimate To Complete (ETC) and that for “Detailed” estimates, the range is 15 to 55% of the ETC.

Obviously any new and unproven technology project may well require 100 to 150% of the ETC. Until sufficient historical data is available for that type of project, there will always be difficulties in estimating just what the percentage should be.

Any project that has a large percentage allocated for contingency should probably be broken down into a series of staged deliverable’s and estimated accordingly. Should the project not perform to expectations and even though changes have been kept to the minimum, the project should be terminated and rethought.
6. The Performance Measurement Baseline And Management Reserve

The Performance Measurement Baseline is a time phased budget plan which actual contract performance is measured against. It is created by the budgets assigned or computed to a scheduled cost accounts and the implied indirect budgets. For future work, not planned down to the cost account level, the performance measurement baseline will also include budgets allocated to higher levels in the contractors work breakdown structure elements and undistributed budgets. It is important to note that the performance measurement baseline equals the Total Allocated Budget less the Management Reserve. Thus the budgeted amount of the Management Reserve is clearly visible to project management as a lump sum at the highest level of the WBS. As shown in Figure 2 below:-

As a result Management Reserve is formally identified and as such must be reported and controlled. This is achieved by reporting usage of it in format 1 of the Cost Schedule Status Reporting standard Def (Aust) 5658.

7. Within The Performance Measurement Baseline Planning for Contingency

As has been previously stated one way of planning for contingencies is to establish a Management Reserve within the Total Allocated Budget. It is probably not a good idea in the main to use Management Reserve for contingency planning, because it has be taken out of the projects operating budget. The alternative choice is to use a cost estimating process where the probability of the occurrence and level of risk are weighted as a means of quantifying the cost implications.
CONTINGENCY versus MANAGEMENT RESERVE

associated with the particular type of risk. High-risk type projects are without doubt major information technological changes, research into new areas etc. These types of contingency can be planned and estimated to provide a budget. However this budget is controlled from above the project manager and the project office, for example, controlled by the client. So these budget costs are outside the project budget execution level and are subject to a more stringent contractual negotiation. This is shown in Figure 3 below:-

There are many occasions in certain types of project, for example, where the contingencies are more likely to be known. In the construction industry (especially in Queensland) where there are well-known weather problems. There are also industrial awards that have wage rate changes resulting from normal industrial relations processes. These types of contingency do not conform to the types that have been previously specified. In fact they are more consistent with the classical dictionary definition. These risks can be costed in the detailed estimate with a degree of certainty, and thus form part of the performance measurement baseline. Where this type of contingency has been included in the baseline, it must be supported by documentation giving past performance statistics in order for it to be included in the detailed estimate. If insufficient historical data exists to justify the contingency to be an integral part of the detailed estimate, then the costs must be included in the separate contingency WBS element as shown in Figure 1 above. Unless this is done the veracity of the cost elements must be in doubt.

8. Where to Locate Contingency Budgets

The contingency costs once established need to be included in the baseline, but where to locate them? There are at least four major locations within the cost control system to allocate them to.

In the actual cost account level work package that reflects the effect of the contingency in that work package because it is experiencing the contingency.

Into a cost account level work package specifically set up to accommodate the contingency.

In a cost account level planning package which provides the ability to plan for a specific project contingency which may occur at some time in the schedule, and so allowing for the decomposition of the planning package into work packages.
CONTINGENCY versus MANAGEMENT RESERVE

Intermediate level planning elements which provides the ability to plan for a specific project contingency (for example industrial disputations which may be inevitable but not consistent enough on a historical basis to allow for detailed planning. The location of this element is high enough in the WBS to allow for decomposition into planning packages and then subsequently into work packages should the contingency occur.

9. Conclusion

Without a doubt all senior management currently does not generally accept the application of contingency and/or Management Reserve formally across the board. The definition and usage of contingency within all projects in an organisation should be established as a project office standard. The amount of the project budget withheld either as contingency or Management Reserve should not be so great as to impact the ability of the project manager to effectively manage the project. Perhaps IT projects with their inherent risk should be implemented in phases or stages. Thus allowing a smaller work package philosophy enabling a more detailed estimate to be made with a much lower risk factor built in.

Where a client prefers to specify contingency as an identifiable budget item within the CWBS, it will always remain out of the project manager’s control. The use of contingency then becomes subject of contractual negotiations. If it is considered part of Management Reserve, then the project office can exercise control.

In either case it remains the responsibility of the project office to identify risk as quickly as possible and to minimise its impact on the Total Allocated Budget and ensure that contingency budget allocations exist.
Appendix 1

The need for Risk Analysis

During the past forty years or so, the proliferation of risk has increased hugely. The real size of projects and investment in major Information Technology systems has expanded dramatically and as has already been said, with a great deal of failure to deliver. Increasingly resources have been downsized out of existence and economic instability within corporate as well as government environments have also increased beyond reason. Within this uncertain and volatile environment the need for risk analysis of potential projects and investments within the IT area has become crucial to the ultimate success of them. The need to carry out risk analysis is specifically apparent when projects have the following characteristics:

- Large capital requirements
- Unbalanced cash flows, requiring a large proportion of the total investment before any returns are obtained
- Significant new technology
- Significant change in information technology methods within the corporation
- Unusual legal, insurance or contractual
- Important financial, economic or political ramifications
- Sensitive environmental or health and safety issues
- Re-engineering of existing business processes to new methods
- Stringent regulatory or licensing requirements.

In most instances the extra information needed to minimise risk and contingency to acceptable levels before initiating a project is simply not available or is too costly and may be too time consuming to obtain. More often than not the risk is pushed into the “too hard basket” and management piously hopes that it will be able to control the risk if and when it occurs. Naturally this hope is dashed every time.

Before large budgets are irrevocably committed to a risky project, early assessment using risk analysis techniques should be carried out. The risk is then properly quantified and the appropriate funds allocated for any contingency required minimising the identified risk.

Risk, Risk Analysis and Risk Engineering

Risk is defined as being exposure to the possibility of economic or financial loss or gain, physical damage or injury, or delay, as a consequence of the uncertainty associated with following a particular course of action. Source: Dr. Dale F. Cooper
CONTINGENCY versus MANAGEMENT RESERVE

Risk Analysis involves a number of methods to deal with the problems created by uncertainty, including the identification, evaluation, control and management of risk.

Risk engineering is the process of integrating all the varied aspects of risk analysis, it provides methods to identify and measure uncertainty as defined and to produce the necessary results to reduce the incidence of risk. The results are arrived at by effective and efficient management decision.

Risk engineering is a structured means of looking into the life cycle of a project. It differs from the usual sensitivity analysis that is traditionally carried in the following areas:-

- utilising the work breakdown structure at the fourth or fifth level and analysis the uncertainty associated with each planning or work package
- identifies the causes of time delays, cost changes, resource constraints, technological constraints, the amount of R&D that needs to be carried out; and evaluates responses to associated potential problems, before assessing net effects
- considers the degrees of dependency between risks and between the project activities.