IMPROVING ESTIMATING AND COST MANAGEMENT ON IT PROJECTS

Author: Martin Vaughan (with review/input from Chris Dwyer)

INTRODUCTION

The recent economic downturn has seen focus shift once again to cost and schedule performance in IT projects. New projects have to fight harder for limited investment funding and in flight projects are being more closely scrutinised for Business Case outcomes. Project Managers and IT Professionals are being asked to deliver greater maturity in their Estimating and Cost Management approaches. This paper will explore attributes unique to IT projects, as well as those common to other project types. It will propose a number of focus areas which, we argue, will improve success from the perspective of project cost.

IS THERE A NEED TO IMPROVE ?

What the research says

Cost overrun has been a feature of Standish Group's CHAOS Report since it was first published in 1994. Through its many updates the report has proposed there were major problems with cost overrun in IT Projects with claims ranging from the rather ambiguous 189% overrun in 1994 to a more realistic 54% in the 2008 study. Other studies[1] indicate a cost overrun of 33% is more realistic. Regardless, executives in most organisations would argue that an overrun of that magnitude is unacceptable in today's climate.

As an investor considering a Business Case, what would sensitivity analysis show if you added 30% to the project cost? Many positive NPV Business Cases may well find themselves unviable. Attitudes such as "All IT Projects overrun, you should expect that" arise, with excuses made for poor performance. Clearly this is not sustainable.

Unique to IT ?

Some people believe IT projects are unique compared to other engineering disciplines so estimating and cost management techniques are therefore not transferable. We will argue differently in this paper. Having worked within IT for many years as well as in Construction, we recognise that there are some complex aspects to IT Projects including:

- Funding issues (particularly year to year funding)
- Senior Management's limited understanding of Project Cost management
- Lack of Requirements clarity
- High degree of integration to business process change

What is not unique to IT is that the projects are made up of large labour components, some material and fixed cost components and a reasonably significant risk budget. Like Engineering projects there may be large procurement contracts with suppliers and a heavy involvement by the customer. What is typically lacking is the ability to create definitive statements of scope and the discipline to keep scope aligned with budget.

One aspect interesting to note on Engineering and Construction projects is the role of the Quantity Surveyor. On larger projects a trusted practitioner will be appointed by either the customer or the builder to measure the project scope. Unit costs are then applied to establish a project cost estimate and budget. The Quantity Surveyor will then assist throughout the life of the project with scope change and hence changes to budget. On IT projects this important role does not exist (with the exception of some application development projects which use Function Point Analysts). It is typically left up to the Project Manager to fulfil this role, however the role is a discipline in its own right and can be very difficult, even for experienced practitioners.

Another unique aspect to some application development projects is where the solution is built progressively through iterations using Agile or other techniques. In many cases time and manhours are fixed while scope is then chosen to fit the window. Even in such a project, the scope is often defined in terms of quantities such as function points or use cases. More traditional estimating techniques are then used for other scope elements such as infrastructure, business change, training, etc.

Games played

The other aspect worthy of noting in relation to Estimating and Cost Management is the games played by management, finance, sponsors and IT staff. IT Projects exist in an environment where some would argue they are under funded to fulfil an operational role, where resources need to be backcharged to ensure "recovery" occurs, where outsourcers and IT groups work in "partnership" but in reality only work on funded work orders. Funding is restricted by senior management, contingencies cut or removed, projects are deliberately established with inadequate budgets with an expectation by all that funding will be revisited. Funding may be restricted on a period to period basis with projects encouraged to speed up or slow down expenditure.

Managers sometimes use power and coercion to pressure IT Teams, particularly around estimates. It is often the same managers who then criticise the IT Teams for not meeting those estimates. There is much written on these games, some very funny. Like Dilbert, beneath the humour there is sometimes a serious message. In this case it is about the distortion of scope and/or estimates when forming budgets.

Skills decline ?

With technology improvements to Project Management software and a general skilling up in Project Management across IT, one would expect that Estimating and Cost Management skills would have increased. The sad fact is that planning and estimating has been "dumbed down" with mass access to scheduling tools and estimating spreadsheets masking this fact. Date driven scheduling, the lack of basic formalised planning via a logical WBS and incomplete spreadsheets focusing just on budget vs actuals or just on external costs are all warning signs. Status reports which don't clearly articulate when the project will finish and what it will cost or reports that simply provide palatable information should be of concern.

All projects should have logic based schedules, cost models focused on Estimate at Completion, a comprehensive costed Risk log and a definitive Scope Change log. These are the keys to managing cost which are lacking in many IT Projects. Every certified / qualified Project Manager has the knowledge to apply these basic principles, yet many don't. Skilling

up inexperienced IT Project Managers and raising expectations of experienced IT Project Managers will help put these fundamentals in place.

AUTHORS OPINION

It is the author's opinion that a major reason IT projects overrun is due to insufficient budget, often due to the original estimate being flawed. We believe that a better initial estimate would see a more realistic budget formed and hence an increase in project financial performance. An improvement in project cost management skills, by Project Managers as well as Senior Management is also needed.

In the longer term the Project Management profession working in IT projects should consider formalising the role of an IT Quantity Surveyor role.

A MODEL FOR THE FUTURE

Focus on Scope

Scope management is fundamental to managing cost, regardless of project type. Some projects are delivered over budget, while others which are delivered on or under budget fail to deliver all the scope. Earned Value Management theory recognised this as a fundamental aspect of managing cost, EVM theory does not allow a change in budget without scope change, nor a change of scope without budget change.

A return to basics such as a definitive product based Work Breakdown Structure is recommended. Definition of responsibility for each WBS element and establishing those elements as the cost control points is critical. These are all basics of cost management adopted in other project disciplines, they can apply just as well in IT.

Definition of the project WBS, including a WBS Dictionary (providing more detail of the scope as necessary) will soon establish the boundaries and define the exclusions. Definition of exclusions is more important than inclusions, particularly in IT projects.

Control points (People and Codes)

Through definition of the WBS as discussed earlier, Control points can be established for scope, cost and schedule. The Control point code will drive the accounting system for collection of actuals, the resource and cost model for derivation of an "Estimate to Complete" and the schedule for delivery of milestones and deliverables.

Selection of an estimating technique which suits the Control point will ensure as accurate an estimate as possible. Major dependencies between WBS elements will help define the overall master schedule by providing a focus for Project Managers on interaction between the project team. Clarifying responsibilities and setting realistic budgets at a control point level will ensure an achievable plan is established.

Rolling wave planning

Rolling Wave Planning is another concept borrowed from Earned Value Management. It is an approach that states most of the planning effort should be spent on near term packages of work, and future "planning packages" can be left for the future. This technique comes intuitively for many people and will necessitate the use of "top down" or "analogy" techniques for future work. Near term work can be planned more "bottom up" or with more sophisticated techniques as required.

Adoption of Rolling Wave Planning will necessitate, in the future, more detailed planning activity when these "planning packages" are opened. An example is testing, most IT projects determine a test strategy which sets the test windows, then plans in much more detail as testing approaches. Project Managers will inevitably face situations whereby the "top down" allowance and "bottom up" estimate needs to be reconciled. Where there is a significant variance, the ability to manage uncertainty and contingency is tested.

Uncertainty

Uncertainty, Contingency and Management Reserve are among the most misunderstood topics in IT Project Management and form the basis of many of the games noted earlier.

While it is clear that certainty in project estimates improves as projects achieve requirements signoff and solution design, it is puzzling that most project approval processes require budget to be locked in very early in the process, when uncertainty is high. There is a "chicken and egg" scenario existing whereby only through the scoping and solution design can a more definitive estimate be made but only thorough an estimate can a project get a budget and some projects cannot even start without a budget. We would recommend that uncertainty be quoted with a definitive number as a plus/minus percentage. Alternatively a higher level of contingency must be added during early stages.

While definitions vary between Contingency and Management Reserve, for the purposes of this paper we define Contingency as those funds used to offset Risk which are managed by the Project Manager and Management Reserve is similar but managed by the Sponsor. Without going into word gymnastics such as known unknowns and unknown unknowns, Contingency should fund Risk response plans which will be undertaken as well as funding for anticipated unknowns. It should be noted that approaches to Contingency vary with some organisations separating the Risk Response costs and distributing within the lower level budgets while others have a centralised budget. Scope Changes would be typically funded out of Management Reserve at the discretion of the Sponsor, they may also hold some additional funding for unknowns. It should also be noted that some organisations hold a Risk Reserve, which is used across a program or portfolio to fund risk impacts and/or Contingency plans.

We can learn from engineering projects where some degree of Contingency is always allowed, eg for inclement weather. While the percentage allowance in IT projects may be open to debate, there is certainty that the percentage shouldn't be zero. The actual percentage will depend on the project, the confidence in the estimate, and the number and magnitude of unknowns. If nothing improved research would indicate an allowance of 30% may be required.

Managers who insist on zero contingency are either building a "hide it" culture or are ensuring there is a zero probability of achieving budget.

Education

Implicit in the paper so far has been the need to further the education of Project Managers in relation to estimating and cost management. The Project Management profession has rightly focused education in the last few years around leadership, communication and soft skills. The profession needs to go back to basics and revisit fundamental planning and estimating skills.

What is more important within IT Projects is the need to educate senior managers, particularly those involved with Finance and those on Steering Committees. We are seeing a basic misunderstanding of key project terminology and a lack of ability to analyse and fully interpret project financial reports. A change of focus to "at completion" rather than "year to date" together with rewarding accurate, if unpalatable forecasts is needed. Removing the games and assisting Project Managers to professionally form realistic budgets will see an improvement in overall project cost performance.

Assurance

There is a role for assurance in Estimating and Cost Management, to set standards and ensure that as a minimum they are met. Standards will help ensure that recipients of reports can interpret them and also help to ensure that a common basis of reporting is established. Assurance can include independent review of estimating and cost models, again to validate that figures quoted truly reflect the latest forecast and that budgets are maintained without uncontrolled or unauthorised change.

History

History is one of the most powerful estimating tools an organisation has. The Project Management Office, if one exists, should be collating historical data on "typical" projects and in doing so feeding these back to the organisation. Development of "rules of thumb" and other simple measures can help all IT Teams, particularly the Project Manager putting together an estimate.

CONCLUSION

Schedule and cost reporting exist as the heart of most Project Status reports. Schedule and Cost estimates form the basis of the Business Case and help determine which projects are funded. Schedule and cost reporting drives most project related meetings. Given the focus, and given the poor reputation IT Projects have for cost overruns it is logical to deduce that a blend of education, standards and a fundamental change to how uncertainty is managed will help build financial success rates.

REFERENCES

1. Jorgensen & Molokken (2006), How large are software cost overruns ? A review of the 1994 CHAOS Report
2. The Chaos Report, published by The Standish Group (1994, 1996, 1998, 2000, 2002, 2004, 2006, 2008)
3. Practical Project Estimation 2nd Edition (2005), published by the International Software Benchmarking Standards Group
4. Estimating Games, published on Thomsett International web site
5. Dilbert cartoons, various written by Scott Adams

ABOUT THE AUTHOR

Martin Vaughan is a Senior Consultant and Director of Core Consulting Group (www.coreconsulting.com.au). With 20 years Project Management experience, he also lectures regularly in Project Management at Melbourne University at a Post Graduate level. Martin takes a strong interest in Project Management career development and has implemented a successful Graduate Program for Project Management.

Martin brings a breadth of knowledge, using proven approaches in Defence, Construction, Government and ICT industries, integrating technology and business change aspects of projects. With over ten years experience as a company Director in private industry as well as the Not-for profit sector, he also has a broad understanding of business and community.