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Kieran Conboy

*National University of Ireland Galway*, [kieran.conboy@nuigalway.ie](mailto:kieran.conboy@nuigalway.ie)

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## Project Failure en Mass: A Study of Loose Budgetary Control in ISD Projects

Kieran Conboy  
National University of Ireland Galway, Ireland

### Abstract

This paper investigates the tightness of budgetary control over projects in a large systems development multinational. This represents a case of extreme ISD failure en mass, where all but 2 of the 22 projects in a business unit went over budget, causing senior executives to refocus their strategic priorities and cancel all current and potential projects that followed. This study focuses specifically on the two best performing (12% and 4% under-budget) and worst performing (223% and 320% over budget) of these projects. Using a framework drawn from control systems theory, this study examines the 'tightness' of budgetary control that was exerted over each project, and what was done or could have been done to avert such failure. The study then identifies a set of emerging factors affecting tight budgetary control in ISD.

**Keywords:** Budgeting, control, project management

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# PROJECT FAILURE *EN MASS*: A STUDY OF LOOSE BUDGETARY CONTROL IN ISD PROJECTS

**Kieran Conboy**

National University of Ireland, Galway

kieran.conboy@nuigalway.ie

## ABSTRACT

*This paper investigates the tightness of budgetary control over projects in a large systems development multinational. This represents a case of extreme ISD failure en mass, where all but 2 of the 22 projects in a business unit went over budget, causing senior executives to refocus their strategic priorities and cancel all current and potential projects that followed. This study focuses specifically on the two best performing (12% and 4% under-budget) and worst performing (223% and 320% over budget) of these projects. Using a framework drawn from control systems theory, this study examines the 'tightness' of budgetary control that was exerted over each project, and what was done or could have been done to avert such failure. The study then identifies a set of emerging factors affecting tight budgetary control in ISD.*

## BACKGROUND TO THE STUDY

It is well known that the majority of information systems development (ISD) projects run drastically over-budget or fail altogether. Various studies have found that between 40% and 60% of ISD projects fails to meet budget estimates and that the degree of overspend can exceed 200% (Robey and Keil, 2001, Keil et al., 2000, Goldfinch, 2007, Whittaker, 1999, Chiang and Mookerjee, 2004, Bartis and Mitev, 2008). Although somewhat dated, the Standish Group conducted one of the most extensive and often cited studies which showed that, of 8,000 projects, only 16% were completed within budget (Johnson, 1995). There is no reason to suggest that this trend is improving. Such failures are not restricted to certain industry sectors or project types; rather they occur with some regularity in systems development projects and organisations of all types and sizes (Ewusi-Mensah and Przasnyski, 1991, Ewusi-Mensah, 2001, Park et al., 2008) in both the private and public sector (Goldfinch, 2007, Whittaker, 1999).

Despite the fact that overspending is such a concern, little research has focused specifically on how budgeting or other general management accounting techniques are being used in ISD. An analysis of the relevant ISD literature shows that blame is attributed to the developers, managers or customers; the development method or process was flawed, inappropriate or obsolete, the team were not managed, directed and monitored sufficiently, or requirements were poorly elicited because the customers did not know their own business. Rarely if ever is the budget target itself ever questioned. Studies that highlight these disastrous overruns provide little or no information on how the budget was set, how it was communicated, whether it was attainable, how adherence to the budget was monitored and controlled, or how it was integrated into the performance evaluation and reward functions of the project or organisation. In particular, attention has not focused on the tightness of budgetary control over ISD projects, which is somewhat surprising given the prevalence of unacceptable budgetary performance throughout the field.

Given that there has been little research on budgetary control in ISD projects, and none specifically on the tightness of these controls, we sought in this study to identify the factors affecting tight budgetary control in ISD projects. Our research objective is thus *to investigate and identify the factors affecting tight budgetary control in ISD projects*.

The next sections of the paper summarises the pertinent literature and describes the theoretical basis and research approach adopted in this study. The findings from four 'revelatory' case studies is then presented, showing that budgetary control of all four projects was very loose. These findings are then discussed and through further analysis, a theoretical model of the factors affecting tight budgetary control is then presented. The paper concludes with a discussion of the implications of the study and possible avenues for future research.

## THEORETICAL BACKGROUND

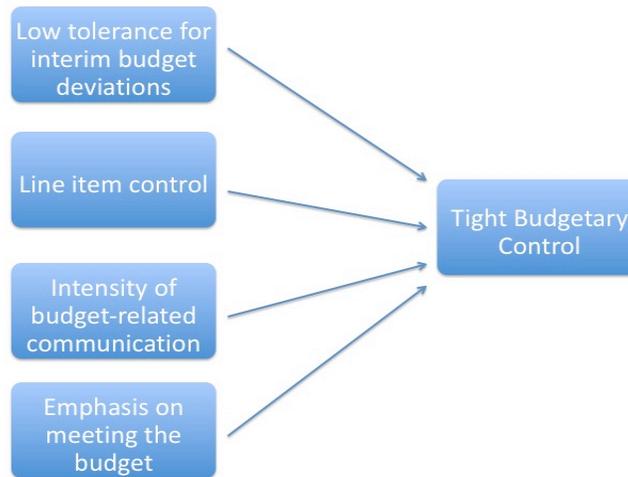
### Project Management Control

According to one of the seminal texts on management control, the concept of control itself is probably “one of the most ill-defined in the English language” (Emmanuel et al., 1990). Many others have noted the inconsistency and ambiguity associated with the term (Merchant, 1985, Merchant, 1998), none moreso than Rathe (1960) who identified 57 variants at a time when management control was said to be a relatively simple concept. Both the APMBOK (AssociationforProjectManagement, 2000) and PMBOK (ProjectManagementInstitute, 2009) contain major segments which address the issue of project control. In the former, a dedicated section includes many of the tools traditionally associated with control. In the latter, control forms part of many different Knowledge Areas such as ‘cost control’ within ‘project cost management’ and ‘schedule control’ under ‘project time management’. The importance of effective project control has been highlighted, both in general (Rozenes et al., 2006, Avison et al., 2001, Cicmil, 1997), and specifically in ISD projects (Kirsch, 1997, Henderson and Lee, 1992, Choudhury and Sabherwal, 2003, Schmit et al., 2001, Whittaker, 1999, Chiang and Mookerjee, 2004, Chow and Cao, 2008, Kirsch et al., 2002), and has been shown to “play a major role as the cause of project failures” (De Falco and Macchiaroli, 1998).

There are many ways to implement project control, and most use a combination of many input-oriented, process-oriented and output-oriented controls also referred to by Merchant (1998) as result, action and personnel controls. The focus of the control also varies, and is almost always multi-dimensional (Rozenes et al., 2006). In most projects, control is exerted over the three main axes of project management, namely time, cost, and scope (ProjectManagementInstitute, 2009, Rozenes et al., 2006, AssociationforProjectManagement, 2000). While this is not applicable in every industry and project type, this is inevitably the case where ISD projects are concerned (Chapman and Ward, 2002, DeMarco, 1982, Jurison, 1999). The three are inexorably intertwined, and an impact on one usually has an impact on the others. However, cost is often regarded as the most important and powerful control system in most organizations and projects (Armstrong et al., 1996, Ekholm and Wallin, 2000, Merchant, 1985, Merchant, 1981, Merchant, 1998, Hansen and van der Stede, 2004, van der Stede, 2001). Given the prevalence of poor budgetary performance in ISD projects as discussed earlier, the remainder of this paper focuses on this one aspect of control; issues regarding scope and schedule control are outside the scope of this paper.

### Measuring ‘Tight Budgetary Control’

Van der Stede (2001) highlights a general lack of agreement as to what defines and constitutes ‘tight budgetary control’. His study identifies one of the earliest, and at the time most commonly used interpretations of the term (Merchant, 1985), and then illustrates how subsequent research adapted and extended it (Anthony and Govindarajan, 1998, Simons, 1995, Merchant, 1998). He contributes to the literature by constructing a measurement instrument to capture tight budgetary control. His original research instrument contained five subcomponents, namely *low tolerance for interim budget deviations*, *detailed line-item follow-ups*, *intense discussions of budgeting results*, *emphasis on meeting short-run budget targets*, and *level of tolerance for budget revisions during the year*. While he found that the first four were all indicative of tight budgetary control, he found no support for the level of tolerance for budget revisions during the year. The resulting measure is presented in Figure 1.

**Figure 1: Attributes of Tight Budgetary Control (adapted from van der Stede, 2001)**

- *Tolerance for interim budget deviations:* In a loose control environment, corporate management do not routinely inspect deviations at all, or do so only if there is “something clearly amiss” (van der Stede, 2001). In a very tightly controlled environment, a deviation immediately triggers corporate reviews or other forms of intervention, and the manager is often required to report the causes of the deviation and the corrective action taken.
- *Line item control:* In some cases, senior management only analyse adherence to the overall budget, commonly referred to as the ‘bottom-line’ figure. This gives the manager a lot of freedom as they can offset positive and negative line-item variances but still achieve the overall budget target. If tighter control is exerted, a manager may be required to submit line-by-line deviation reports, and their performance evaluation may take these more detailed variances into account.
- *Intensity of budget-related communication:* This attribute of tight budgetary control covers a range of issues. Contributing items listed by van der Stede include (i) high frequency of budget-related communication between manager and corporate superiors; (ii) face-to-face meetings between manager and corporate representatives; (iii) the formation of a team to discuss budget matters comprising the manager, the manager’s corporate superiors, and the manager’s sub-ordinates; (iv) budget-related communication regardless of whether there is no negative deviations; and (v) consultation between manager and superiors as to ways of achieving the budget.
- *Emphasis on meeting the budget:* This attribute considers the importance corporate superiors attach to meeting the budget. Contributing items van der Stede suggest include the extent to which the manager’s performance and promotion prospects are judged on meeting the budget, and the extent to which meeting the budget equates to success. In addition a key item of budget emphasis is the extent to which superiors consider meeting short-term budgets essential.

There were a number of reasons for basing this study on van der Stede’s interpretation and measure of tight budgetary control. Firstly, other studies of budgetary control measures tend to focus at an operational level or certainly at some level within a particular business unit or function (e.g. Brownell, 1985, Hopwood, 1972, Merchant, 1981). Perhaps the most important motivation behind the use of van der Stede’s model is that it contains items relevant to “the junction between corporate management and business unit managers” (van der Stede, 2001), which is appropriate given that the objective of this study is to determine the extent to which ISD project managers are tightly controlled in terms of budget. The rigor and general quality of the measure is also evidenced by its use in a number of subsequent seminal studies in the management accounting domain (e.g. Marginson and Ogden, 2005, Hansen and van der Stede, 2004, Tayles et al., 2007, Bisbe et al., 2007). In fact, many subsequent researchers have directly commented on the quality of the paper. Noeverman, Koene et al (2005) believed it to be a rare example in the whole area of Reliance on Accounting Performance Measures (RAPM) that “seems to be free of validity and

reliability problems". In their call for higher precision in the specification of management accounting concepts (Bisbe et al., 2007) cite van der Stede's model as one of a few good examples to follow.

## RESEARCH DESIGN

### Research Site

This study explores the tightness of budgetary control exerted over four systems development projects. These projects were based in one large multinational organization, were part of the same business unit, and were purposively selected for this study. Firstly, the business unit within which the four projects reside was terminated solely due to poor budgetary performance (only 2 of 22 projects were completed within budget). All non-critical projects and projects in the pipeline were cancelled with immediate effect in February 2007. Tight budgetary control is unnecessary and occasionally counterproductive if meeting the budget is not considered very important by any of the stakeholders involved (Merchant and van der Stede, 2007), and so indicators of budget importance were critical when choosing cases for this study. The fact that the entire business unit was disbanded due to budgetary problems is a strong indicator that meeting the budget was very important in these cases. The two best performing projects (12% and 4% under-budget) and worst performing projects (223% and 320% over budget) were chosen as 'revelatory cases' (Yin, 2003) to allow effective comparison and contrast between projects and identify interesting insights. This choice helps distinguish between what may be an organizational or business unit problem (across all projects) and what may be problem at the project or team level.

**Figure 2: Profile of the Four Cases**

	Project A	Project B	Project C	Project D
Budget deviation at project end	12% under	4% under	223% over	320% over
Project duration	19 months	30 months	32 months	19 months
Annualised deviation	-7.58%	-1.6%	83.63%	202.1%
Random audit	Yes, after 18 months	No	Yes, after 4 months	No
Team size	20	24	31	29
Team composition	1 senior manager 2 managers 2 team leads 11 developers 4 testers	1 senior manager 3 managers 4 team leads 19 developers/testers	1 senior manager 5 managers 0 team leads 26 developers 4 testers	1 senior manager 3 managers 1 team lead 20 developer/testers
Location	Same building	Collocated in an open office space	Collocated in an open office space	Distributed across 3 countries
Development method	Scrum/XP	Scrum/XP	MethodABC	MethodABC
Senior manager experience	4 years	3.5 years	3 years	3 years
Type of system developed	Commercial product	Commercial product	Organisational intranet	System for project management accounting
Customer type	External	External	Internal	Internal
Personnel interviewed for this study (2 phases)	1 senior manager 2 managers	1 senior manager 3 managers	1 senior manager 5 managers	1 senior manager 3 managers

In terms of governance, each project was lead by a single senior manager with a number of sub-ordinate managers reporting to him or her. Within the accounting function, an account manager was assigned to each project to deal with monitoring and control of the budget and any related issues. All time and expense reports were submitted fortnightly to the accounting system, but the audit manager's formal role includes ongoing communication with the senior project manager. An audit team was also in place to conduct random interim assessments of selected projects. A steering committee was in place, comprised of senior management executives within the region. This committee evaluated and approved project proposals in line with a governing strategy emanating from corporate headquarters in the U.S.

It is clear that the four projects under scrutiny are different in many ways, varying according to team size (failed are larger), team composition (failed projects have significantly less team leads), managerial experience, use of

development method, project type and location. Any, and perhaps all of these variables may have affected the degree to which each project was over or under budget. In addition, one can question the value of analyzing the budget deviations, given that poor estimation may have resulted in the budget target itself may have been inappropriate from the outset. From a methodological point of view, however, the extent of the budget deviations, the cause of the deviations, or the accuracy of the original estimations are not a significant concern, as this study does not seek to determine whether budgetary control, or indeed any other variable, influenced the final budget deviation. Rather the objective is simply to determine what factors affected the tightness of that budgetary control.

### Data Collection & Analysis

Data was collected over a 6 month period from March to August 2007. Data collection was primarily personal face-to-face interviews, a technique well suited to case study data collection, and particularly for exploratory research such as this because it allows expansive discussions which illuminate factors of importance (Yin, 2003, Oppenheim, 1992). The information gathered is likely to be more accurate than information collected by other methods since the interviewer can avoid inaccurate or incomplete answers by explaining the questions to the interviewee (Oppenheim, 1992). The interviews lasted between 50 and 120 minutes. The questions were largely open-ended, allowing respondents freedom to convey their experiences and views, and expression of the socially complex contexts that underpin ISD (Yin, 2003, Oppenheim, 1992). The interviews were conducted in a responsive (Rubin and Rubin, 2005, Wengraf, 2001), or reflexive (Trauth and O'Connor, 1991) manner, allowing the researcher to follow up on insights uncovered mid-interview, and adjust the content and schedule of the interview accordingly. In order to aid analysis of the data after the interviews, all were recorded with each interviewee's consent, and were subsequently transcribed, proof-read and annotated by the researcher. In any cases of ambiguity, clarification was sought from the corresponding interviewee, either via telephone or e-mail. Supplementary documentation was also collected, including project management plans, budgets and budget reports, meeting minutes and relevant e-mail communications.

Data analysis used Strauss & Corbin's (1998) *open coding* and *axial coding* techniques. Open coding is "the process of breaking down, examining, comparing, conceptualizing, and categorizing data" (Strauss and Corbin, 1998). Glaser (1992) argues that codes and categories should emerge from the data, while with Strauss & Corbin's approach (1998) these are selected prior to analysis. The approach adopted in this study is more akin to the latter, where the interview questions and subsequent analysis was based on van der Stede's (2001) model of tight budgetary control, and specifically its four underlying constructs (*tolerance for interim budget deviations*, *line-item control*, *intensity of budget-related communication* and *emphasis on meeting the budget*). These provided a list of "intellectual bins" or "seed categories" (Miles and Huberman, 1999) to structure the data collection and the open coding stage of data analysis. A sample of open coding data is shown in Appendix A.

The second phase of analysis used axial coding. Axial coding is defined by Strauss and Corbin (1998) as a set of procedures whereby data are put back together in new ways after open coding; whereas open coding fractures the data into categories, axial coding puts the data back together by making connections between the categories and sub-categories. As the data was coded, theoretical questions, hypotheses and code summaries arose. These were documented in analytic *memos* (Miles and Huberman, 1999) to aid understanding of the concepts being studied and to refine further data collection. Miles and Huberman (1999 p. 72-74) offer advice on effective analytic memos, and these practices were followed where possible. As categories emerged follow-up interviews were arranged to elicit further, richer, more focused information. This was done to confirm, extend, and sharpen the evolving list of categories. As categories became integrated, further data collection did not tend to cause any additional categories to emerge, but rather reinforced those already in existence. At this point, the categories were deemed to be "theoretically saturated" (Strauss and Corbin, 1998), and data collection ended.

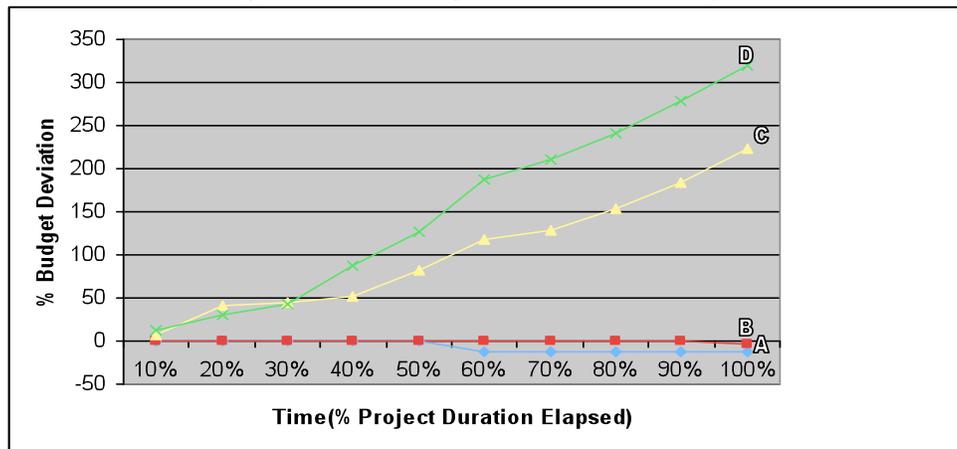
### FINDINGS

In this section, the results of the four case studies are presented and discussed. Firstly, the tightness of budgetary control over each project is discussed, in accordance with the four measures of control in the conceptual framework adopted in this study. The factors affecting tightness of budgetary control, which emerged from the axial coding phase of the analysis, are then presented and further illustrated with quotes from the interviews.

### Tolerance for Interim Budget Deviations

While we know that projects A and B completed under budget while projects C and D's eventually performed very poorly, this does not necessarily mean that the interim budget figures followed similar trends. One single event near the end could have brought a trend of overspending back on target, and likewise may send a previously well-managed project spiraling out of budgetary control. However, Figure 3 shows that this was not the case in any of these projects. Project A and B never went over budget at any stage, and it is also clear that in the case of C and D, signs of the eventual overruns were evident from an early stage in the project, and this trend continued consistently throughout both projects. As A and B experienced no significant interim deviations it is difficult to determine from Figure 3 alone whether tolerance would have been low or high. The early and continuous overruns on Project C and D suggest that tolerance was high. However, this is by no means conclusive; all that is evident from this data is that corporate superiors did not terminate either project prior to its completion.

**Figure 3: Interim Budget Deviations Across Projects**



An analysis of the underlying sub-constructs within the tolerance for interim budget deviations reveals more conclusively that the projects were loosely controlled in this regard. In a tightly controlled environment, the project manager is required to explain (i) causes for interim deviations and (ii) corrective action that will be taken to correct or address the deviation. At the time of the interviews, the formal organizational procedures in ABC required all project managers to submit a monthly status report. This was a very rudimentary, one page document where each project was flagged as green, amber or red, signifying increasing levels of concern, ranging from 'no issues' to 'show-stopper' issues. This document did include a field for explanation of variances and details of any corrective action to be taken. However, according to all four managers, the norm in the organization was that all managers tick the green, amber or red status box, but never complete the explanation or corrective action columns. Regardless of whether managers did or did not complete this document, there was evidence to suggest this document was not effectively used as a mechanism for tight budgetary control. For example, 15 of the 19 reports submitted by Project Manager D had his project statuses set to red, yet there was no subsequent query or action taken as a result. Project Manager B never submitted any of these reports throughout his 30 month project, and while an automatically generated reminder was issued, there was no subsequent follow-on query or action taken by the accounting function.

### Line Item Control

Apart from Project C where travel spending was restricted to 11% of the overall project budget, there was no evidence of control at the budget line item level across any of the four projects. The control reports did not have to explain budget variances on a line-by-line basis. The project managers all stated that corporate superiors were only interested in the bottom line budget figure. Regardless of the managers' opinions, it was also clear from the interim management accounts that corporate superiors did not investigate budgets on a line-by-line basis. The line items on the Project A, B, and C interim account reports were all incorrectly aligned to some degree. One monthly report of Project C's budget provides an illustrative example (Figure 4).

As the account was set up incorrectly, all labour expenses were being allocated as 'travel'. Therefore the travel

spend was reported as being over by more than 600%, when in actual fact very little had been spent. Also £150,990 of regular, in-house developer labour was incorrectly labeled as a subcontractor cost, a line item which had a zero budget allocation. £87,460 was spent but reported simply as ‘other costs’. All three of these issues had a significant material affect on the budget and caused three line items to incorrectly appear grossly over budget. The interesting issue here, however, is that none of these adverse figures triggered a query from corporate head office, showing that line item control was not just loose but non-existent.

**Figure 4: Example of Line Item Discrepancies – Project C Interim Budget Status**

<b>BUSINESS UNIT: SERVICE GROUP: CLIENT: PROJECT CODE:</b>	<b>Budget</b>	<b>Actual To Date</b>	<b>Committed</b>	<b>Budget % Remaining</b>
	<b>£</b>	<b>£</b>	<b>£</b>	
PRE-CONTRACT				
LABOUR – BUSINESS UNIT	625,123	0	0	100.0%
LABOUR – NON-BUSINESS UNIT	0	0	0	0
LABOUR – SUBCONTRACTOR	0	150,990	0	-
TRAVEL	122,000	523,280	190,140	-601.16%
DURABLES	50,413	40,117	0	20.42%
TRAINING	221,818	0	0	100.0%
SERVICES	0	0	0	
OVERHEAD	0	0	0	100.0%
OTHER	0	87,460	0	-
.	8,455	0	0	
<b>TOTAL EXPENDITURE</b>	<b>8,455</b>	<b>0</b>	<b>0</b>	<b>100.0%</b>

It must be noted in the analysis that detailed, line-by-line budgeting was not particularly relevant in Projects A and B. Developer time accounted for 97% and 94% of these projects’ original budgets respectively, and so other costs were insignificant and not worthy of detailed monitoring and reporting; essentially there was only one line item on each project, and so was more or less equivalent to the bottom line figure. This was not the case with Project C and D where line-by-line budgeting was very relevant. In the case of Project C, significant line items included not just developer time (62%) but also training (22%), travel (11%) and materials (5%). Part of Project D was outsourced, causing an external consultants line item of 41%. Due to the distributed nature of the project, costs included travel (13%) and accommodation/subsistence (17%). In addition to the regular line item of developer time (29%), this meant that Project D’s budget was dispersed across many significant line items.

#### *Intensity of Budget-related Communication*

Formal budget-related communication between the project manager and corporate superiors was low across all four projects. One formal meeting was organized by the managing partners every six months and was attended by the project managers of each of the 22 IS development projects. While the meeting did focus on budgeting issues it was minimal, and consisted of approximately five minutes discussion around a slide which ranked the projects in terms of budget performance.

According to the managers, these meetings simply highlighted which projects were underachieving, but did not focus on constructive ways of rectifying the situations and achieving the budgets, something recommended by van der Stede.

*“I wasn’t that enthralled by my project being listed as an underperformer, but I was still looking forward to this meeting. I expected to get great feedback from these executives, with point-by-point*

*recommendations drawn on their vast experiences of projects across the globe. Maybe it was just me but I didn't take anything away from this meeting.*"

Project Manager C

The only other communication initiated by corporate superiors was with the managers of Project A and B. Ironically, both of these queries related to the reasons for the budget underspend. According to van der Stede's model, face-to-face meetings to discuss budget deviations are the strongest indicator of budget-related communication intensity. However, none of the four managers were called to discuss budget deviations face-to-face. This is despite the fact that three of the four managers (A, B and D) were located in the same building as their managing partners and both the financial accounting and management accounting functions.

Van der Stede's model advocates the creation of a team comprising a project manager, his superiors and his subordinates to discuss and solve budgeting matters. No meeting involving all three parties took place at any stage in any of the four projects. While this form of corporate superior controller was non-existent, according to all four managers, budget-related communication between the managers and their respective subordinates was very frequent and intensive.

#### *Emphasis on Meeting the Budget*

According to all four project managers, meeting the budget was certainly a factor when their end-of-year performance was assessed. However, all felt that the budget attainment was a much lower priority criterion than the quality of the system, customer satisfaction and the extent to which it is eventually used.

*"Going over budget is never a problem at all here. The key issue is that when we inevitably seek more money after the first allocation runs out, and we always will have to seek money, we need to have a good rationale for the additional funds and how we are going to use it."*

Project Manager D

In van der Stede's model, a measure of budget emphasis is the extent to which unforeseen opportunities are considered more important than achieving the budget. Project Managers A stated that this was not the case on his project, and that while meeting the original budget wasn't mandatory, they did not believe they were in a position to go well beyond the budget simply to exploit new opportunities.

*"I knew there was a comfort factor and that missing the budget wasn't a problem. I would draw a line between letting the budget slip because we simply fell behind versus letting it slip because we went after some large new piece of functionality. Something like that would be require renegotiation of the budget and the setting of a different target."*

Project Manager A

On the other projects however, a looser interpretation was clearly evident:

*"We were adding in new specs all the time. I would say after a month the budget was nothing more than a nominal figure."*

Project Manager B

*"We had a budget figure, but this wasn't tied to any set list of requirements. We were always looking for new opportunities to improve the system from the customer perspective and the budget was rarely considered."*

Project Manager C

*"New opportunities we always chased. The budget was only an afterthought."*

Project Manager D

These comments suggest that there was not much emphasis on meeting the budget and thus is further evidence of loose budgetary control.

#### **EMERGENT FACTORS AFFECTING TIGHT BUDGETARY CONTROL**

It was clear from the first phase of data analysis that budgetary control was quite weak across all four projects. There was a high tolerance for interim budget deviations, there was little control at the budget line-item level, budget-

related communication was largely non-existent and there was little emphasis on meeting the projects. As a result of the subsequent axial coding process, a number of core factors emerged across the four constructs. Table 1 shows which seed categories (the four measures on tight budgetary control list on the horizontal axis) informed each of the emergent categories (vertical axis), according to the empirical data. An “X” denotes each of these linkages i.e. where it is evident that a emergent factor affected one of the constructs of tight budgetary control. Relevant quotes are then presented to further illustrate each of these factors.

**Table 1: Emergent Factors Influencing Tight Budgetary Control in Systems Development**

	Tolerance for interim budget deviations	Line item control	Intensity of budget-related communication	Emphasis on meeting the budget
<b>Development Context:</b>				
System Type	X	X		
Organisational Culture	X		X	X
Project Culture	X		X	X
Customer Type	X	X	X	X
Accounting staff familiarity with ISD context	X	X	X	X
<b>ISD Method Factors:</b>				
Personnel involved in budgeting process	X	X	X	X
Transparency of budget progress	X	X	X	X
Length of iteration		X	X	
Customer involvement	X		X	X

#### *Development Context Factors*

The *type of system* being built did affect the ability to exert tight control. For example, Project A involved the simple creation of a web-based version of an existing system. Therefore requirements were clear and unambiguous and much of the work was simple and repetitive. Project C and D involved the development of completely new systems, both of which were highly complex, involved emerging, untested technology and requirements were very abstract and vague. Budgeting and measuring progress against a budget in this turbulent environment proved very difficult.

*Culture* was also an issue, according to Project Manager C, who claimed that in his previous organization, budget overruns were openly discussed among managers “around the water cooler” and that even if the accounts office tolerated it, poor budgetary performance would informally be the talking point of every managerial conversation. In contrast, within the current organisation “I don’t think anybody else even knows whether my project is over or under” (Project Manager C). It was also clear that this cultural issue was not just an organizational variable, but that *project culture* was also a distinguishing factor. A team lead on Project A stated that her manager “instilled a belief in meeting the budget, whether it was important or not”, while on projects C and D this was clearly not the case.

The *type of customer* also influenced the tightness of control applied. The managers of Project A and B raised the point that, as their systems were for external, commercial sale i.e. for profit, there was an expectation that the profitability of the project would be assessed at some stage in the future. All four managers agreed that an internal project is not so critical in terms of profitability and that functionality and adoption are much more vital metrics of project success.

It became clear from the interviews that it was not just a lack of accounting skills among developers that caused the breakdown in communication. According to the managers, a *lack of familiarity among the accounting function staff* also contributed:

*“HQ accountants don’t really understand what we do here (in the ISD group) and that is why they don’t drill down on the variances on our projects”.*

Project Manager D

These claims are supported by a report (Table 2) listing the acceptable deviation bands for every project in Britain.

This shows the extent to which a budget can deviate before trigger a query from the accounting function. The most restrictive of the 22 ISD projects was 15%, and in 19 of the projects there were no variance controls at all. This compares to the other types of project, many of which were allowed zero deviation; even the most restrictive trigger was 7%. This shows that the accounting function did treat ISD projects differently to the others. This eliminates the possibility that such loose control as discussed earlier is simply prevalent across the organization and all project types, and not just ISD.

**Table 2: ABC Consulting- Acceptable Interim Budget Variances by Project Type**

Type of Project	Lowest variance allowed	Highest variance allowed	Mean variance allowed	Std. deviation of variances
IS Development ( <i>n</i> =22)	15%	No limit	n/a	n/a
Administration/Process Reengineering ( <i>n</i> =7)	0%	7%	6%	0.72%
Management & Strategy ( <i>n</i> =4)	0%	0%	0%	0%
Accounting & Performance Evaluation ( <i>n</i> =41)	0%	7%	5.7%	0.8%
Sales & Customer Relationship Management ( <i>n</i> =12)	0%	7%	5.82%	0.8%

#### ISD Method Factors

Developer involvement in the estimation and budgeting process was important in some of the cases studied. In Project A and B, the developers decided upon all estimates, recorded them, and tracked their own progress against them. According to both managers, this self-regulatory process resulted in “healthy competition” (Project Manager A) between the developers, “a sense of pride” (Project Manager B), and of particular relevance in this study “a heightened awareness of budget issues” (Project Manager B) and “a much tighter control over the budget than I could ever manage” (Project Manager A)

*Transparency of budget progress* also seemed to be a distinguishing factor, tightening budgetary control when present. For example, on projects A and B, peer-reviewed estimation, daily stand-up meetings, pair programming, and storyboards highlighted excess time spent on user stories the day they occurred.

*“There was no opportunity for developers to hide delays. They would have to tell us at the 4pm stand up meeting, and if not the developer they were paired with would soon say something. If not we can also tell if their post-its are not moving across the storyboard”.*

Project Manager B

*“Every developer estimate was discussed by the team. Nobody would give bloated or overly safe estimates of their own work in front of their peers”.*

Project Manager A

In Project C and D where the more plan-driven ABCMethod was used, it was clear that transparency was lower and was loosening control.

*“We did have status meetings but some developers’ work never saw the light of day until testing began. Only then would it become obvious that the work was sub-standard and that there would be budget implications to fix it.*

Project Manager D

The *length of iteration* was also an important factor. The contrast between Project A and C highlighted this issue:

*“Each 2 week iteration highlighted any deviations incredibly quickly. We estimated how many hours or days it will take to complete each user story. At the end of each iteration we automatically know how many hours we are over budget.”* Project Manager A

*“Major deliverables occurred every 4 – 6 months. It was only within the last week or so that we could start to say whether we would hit the budget target or not”* Project Manager D

The level of *customer involvement* also played a role in the tightness of control. In the projects where a customer was continuously involved (A, B and C), the managers acknowledged that there was more emphasis on accurate estimation and progress against those estimates. According to Project Manager D, the lack of a customer presence meant the project “operated in a vacuum”, and the team was not exposed to “the pressures of accountability

## IMPLICATIONS & FURTHER RESEARCH

Despite the pervasiveness of ISD project failure, and that overspending in particular is such a concern, little research has focused specifically on how budgeting or other general management accounting techniques are being used in ISD. An analysis of relevant ISD literature shows that blame for poor budgetary performance is attributed in many different directions, but rarely if ever is the budget target or process itself ever questioned. In particular, attention has not focused on the tightness of budgetary control over ISD projects, which is somewhat surprising given the prevalence of unacceptable budgetary performance throughout the field.

This study describes an organization which where there was a distinct lack of emphasis on budgetary matters, and loose control throughout the projects studied, but then the projects in question, and in fact the whole division, were terminated solely due to poor budgetary performance. It is very significant that the problem did not seem to be symptomatic of poor control across the organization; relatively tight control was imposed on non-ISD projects (process re-engineering, management/strategy, accounting/performance evaluation, sales/CRM), and the problem seemed limited to ISD initiatives. Given the fact that so many ISD projects fail drastically in terms of budget, it is therefore worth questioning whether such loose control is prevalent across the field. Organisations who use cost as the primary determinant of success need to evaluate the extent to which they exert control over project budgets, particularly if they are prone to cancellation as was the case in this study. By no means does this study alone suggest that this apparent lack of control is prevalent across the ISD field; this was simply a revelatory case of four projects in a single organisation. However, it does provide one possible explanation as to why ISD projects perform so poorly, and merits further, more extensive research across a much greater number of these projects.

The primary objective of this paper was to investigate and identify the factors affecting tight budgetary control in ISD projects. The factors that emerged from this study are (i) system type, (ii) organizational culture, (iii) project culture, (iv) customer type, (v) the familiarity of accounting staff with ISD, (vi) the personnel involved in the budgeting process, (vii) transparency of the budget process, (viii) length of development iteration, and (ix) customer involvement. As far as we are aware, this makes a theoretical contribution to the field, as it is the first study that focuses on the tightness of budgetary control in ISD, and the first to identify a set of ISD-specific factors that can hinder such control.

These factors have significant implications for practice. Organisations can use the list of factors to determine if their projects are amenable to tight budgetary control, to identify potential shortcomings, and to determine mechanisms for overcoming these shortcomings. For example, the research showed that the familiarity of accounting staff with ISD projects can cause loosening of what would otherwise be tight budgetary control. To address this, senior management could provide accounting staff with ISD-specific training, or could increase exposure to these projects by requiring face-to-face meetings between the ISD manager and the accounting staff, as opposed to the standard uploading of monthly reports. They could also ‘lock’ the control measures to ensure that ISD projects are forced to comply with the same limits and rules as any other project type, which was not the case in the projects studied as part of this research. The factors above can be used as the structural basis for an action plan to increase amenability to tight budgetary control e.g. justification to provide new managers with project accounting training.

In terms of limitations of the study, it should be noted that while budgets are a key mechanism for exerting tight control, they are by no means the only mechanism; see Merchant and Otley (2007), Merchant and van der Stede

(2007) and Anthony and Govindarajan (1998) for extensive discussions of other control mechanisms. Organisations should ensure that budgetary control is considered within this wider portfolio. Furthermore, it should not be assumed that tightening budgetary control is always a good thing; while tight budgetary control is often positively co-related to budgetary performance, this is not always the case, and overly restrictive budgetary control can stifle a project and increase the chance of failure (Simons, 1995, Widener, 2007). Therefore, before measuring the tightness of budgetary control over an organization or project, assessing the factors affecting that control, or taking any corrective action, it is important to determine whether meeting the budget is the most important dimension of success in that instance.

The study also identifies opportunities for future research efforts. This study identifies potential factors affecting tight budgetary control that were evident in the four cases studied. We suggest that further research could elaborate this list and seek to derive measurable hypotheses. Also, while this study identifies emergent factors, there is no attempt to show how these factors relate to one another and to develop a resulting theoretical model. This could be addressed by future research. Given that some of the blame in this study was attributed to the accounting function overseeing these projects, interesting insights could also be gained by studying the perception of people in that role.

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**APPENDIX A: EXAMPLES OF OPEN CODING**

Quote	Key codes
<i>“Going over budget is never a problem at all here.”</i>	Budget_Emphasis / Loose_Control
<i>“New opportunities we always chased. The budget was only an afterthought.”</i>	Budget_Emphasis / Loose_Control
<i>“I expected to get great feedback from these executives, with point-by-point recommendations drawn on their vast experiences of projects across the globe. Maybe it was just me but I didn’t take anything away from this meeting.”</i>	Intensity_of_Communication / Loose_Control
<i>“I knew there was a comfort factor and that missing the budget wasn’t a problem.”</i>	Budget_Emphasis / Loose_Control

**APPENDIX B: EXAMPLES OF AXIAL CODING (EMERGING FACTORS)**

Quote	Key codes
<i>“There was no opportunity for developers to hide delays. They would have to tell us at the 4pm stand up meeting, and if not the developer they were paired with would soon say something. If not we can also tell if their post-its are not moving across the storyboard.”</i>	Emerging_Factors/Method_Factors/Transparency
<i>“Each 2 week iteration highlighted any deviations incredibly quickly.”</i>	Emerging_Factors/Method_Factors/Length_of_Iteration
<i>“HQ accountants don’t really understand what we do here”</i>	Emerging_Factors/Decelopment_Context_Factors/Lack of ISD Familiarity
<i>“Every developer estimate was discussed by the team. Nobody would give bloated or overly safe estimates of their own work in front of their peers”.</i>	Emerging_Factors/Method_Factors/Transparency
<i>“I don’t think anybody else even knows whether my project is over or under”</i>	Emerging_Factors/Decelopment_Context_Factors/Culture

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