Towards programme risk management

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Abstract

Interest in programme management is growing with the initial issue of *The Standard for Program Management* by the Project Management Institute (PMI®) in 2006 and its second edition due in late 2008, as well as the 2007 revision of the UK *Managing Successful Programmes* standard. Programmes cannot be treated as large projects, but require specific processes, tools and techniques to ensure their effective management. This includes a clear requirement for management of risk, since programmes are obviously risky undertakings. But just as there is a difference between programme management and project management, so programme risk management is different from project risk management. This paper explores the specific characteristics of programme risk management, drawing on current thinking and practice.

Programme risk management must be undertaken at two levels. Firstly it is necessary to manage the overall risk exposure of the programme as a whole ("programme risk"). Secondly there are a range of individual "programme risks" which arise during execution of the programme and which require proactive management. This paper outlines how to manage risk at both levels, through *implicit* and *explicit* programme risk management. Implicit management of overall "programme risk" is focused around risk efficiency, allowing risk exposure to be balanced across the programme. The elements of an explicit programme risk management process are also summarised, addressing "programme risks" from three sources: risks which have been escalated or aggregated from constituent projects and other programme components, strategic risks delegated from higher in the organisation, and specific programme-level risks.

Finally the paper outlines the challenges remaining in developing a robust and effective approach to management of programme risk.

Introduction

Projects are recognised as an effective means to deliver value to a business, which has led to the establishment of project management as a mature discipline (some would say a profession). Project-based organisations are now seeking ways to organise their delivery of projects in the most effective manner, resulting in the emergence of programme management and portfolio management. Both of these new disciplines offer frameworks for structuring project work and relating it to the needs of the business. However neither programme management nor portfolio management have yet reached the level of maturity attained by project management. Nonetheless professional associations and standards bodies have been addressing themselves to defining the new areas. The UK Government Central Computer and Telecommunications Agency (CCTA) published a full suite of guidelines on programme management in 1993-95 (*The Programme and Project Management Library*), which were formalised in 1999 with the first edition of the *Managing Successful Programmes* guide (Central Computer and Telecommunications Agency, 1999), recently updated to its third edition (Office of Government Commerce, 2007). More recently, PMI published first editions of their standards for both program management and portfolio management in 2006 (Project Management Institute, 2006a, 2006b), with second editions due in late 2008 (Project Management Institute, 2008a, 2008b). The PMI *Guide to the Project Management Body of Knowledge* mentions program management only briefly (Project Management Institute, 2004, p 16), while the most recent edition of the APM Body of Knowledge from the Association for Project Management includes programme management as one of its knowledge areas (Association for Project Management, 2006, pp 6-7).

There is clear consensus that organisations will reap benefits by managing their projects in a coordinated manner, and that programme management offers a framework for doing that. Unfortunately the precise details of programme management are not yet defined in a way that is accepted by all. Everyone agrees however that programmes are risky undertakings, so risk management must be an integral part of how programmes are managed. However, since there is no current consensus on the fundamentals of programme management, it is not surprising that programme risk management is even less well defined. This paper briefly outlines programme management basics, then discusses the elements necessary to ensure effective management of risk at programme level.

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Programme management basics

At the most fundamental level, the immaturity of programme management as a discipline is illustrated by the varying definitions of the word "program(me)" (and even its spelling!), and the varying understandings of the purpose of programme management. Exhibit 1 presents definitions from leading programme management standards and guidelines.

SOURCE	PROGRAM(ME)	PROGRAM(ME) MANAGEMENT
PMI Standard for Program Management (2006)	A group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually. Programs may include elements of related work outside of the scope of the discrete projects in the program.	The centralized coordinated management of a program to achieve the program's strategic objectives and benefits.
OGC Managing Successful Programmes (2007)	A temporary flexible organisation structure created to coordinate, direct and oversee the implementation of a set of related projects and activities in order to deliver outcomes and benefits related to an organisation's strategic objectives.	The coordinated organisation, direction and implementation of a dossier of projects and transformation activities (i.e. the programme) to achieve outcomes and realise benefits of strategic importance.
APM Body of Knowledge (2006)	A group of related projects, which may include related business-as-usual activities, that together achieve a beneficial change of a strategic nature for an organisation.	The coordinated management of related projects, which may include related business-as-usual activities, that together achieve a beneficial change of a strategic nature for an organisation.

Exhibit 1: Definitions of program(me) and program(me) management

Despite the obvious differences in these definitions, there is wide agreement that programmes exist at a higher organisational level than projects, and that their purpose is to deliver strategic benefits (Murray-Webster & Thiry, 2000; Reiss et al., 2006; Thiry, 2009). It is also clear that the scope of programmes is broader than just the sum of their constituent projects (Pellegrinelli, 2002; Pellegrinelli & Partington, 2006). More significantly, the objectives of a programme are not simply the sum of the objectives of the projects within that programme, since programme objectives relate to the strategic goals of the overall organisation. In simple terms, project objectives are tactical and relate to deliverables, while programme objectives are strategic and relate to benefits.

Much more could be said about the nature of programmes and the role of programme management. However the aim of this paper is to consider specifically how risk can and should be managed in the context of programmes. It is axiomatic to say that programmes are risky, and that risks need to be managed proactively, but how? Perhaps one option is simply to take project risk management and apply the same process at a higher level? But just as programmes are not just large projects and programme management is not the same as project management, so programme risk management is different from project risk management. Programme risk management has a different aim and scope, and follows a different process which requires different techniques. These are addressed in the following sections.

Aim and scope of programme risk management

The aim of programme risk management is to manage risks at programme level. However this is not as simple as it sounds. A risk can be defined generically as "an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more <> objectives". Inserting the word "project" at the point marked <> gives a specific definition of project risk (Project Management Institute, 2004, page 238). It is also possible to define other types of risk by inserting other words, including "strategic", "technical", "environmental", "personal" etc. Similarly, a programme risk can be defined as "an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more programme objectives".

Since programmes sit between projects and organisational strategy (Pellegrinelli & Bowman, 1994; Murray-Webster & Thiry, 2000; Project Management Institute, 2006a, 2008a; Thiry 2009), there are three potential sources of risk that could affect a programme. Risks could arise at programme level from three directions, as illustrated in Exhibit 2, namely up from the components of the programme, down from organisational strategy level, or sideways from the programme level itself. The scope of programme risk management must include all three sources of risk.

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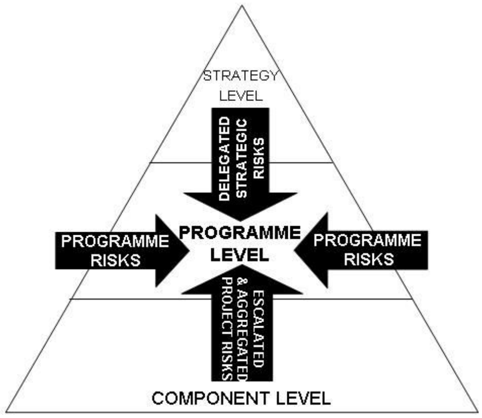

Exhibit 2: Sources of risks at programme level

Risks escalated or aggregated from below

We have already seen that the objectives of a programme are more than the sum of the objectives of its constituent projects. So programme risks are not simply the sum total of project risks. There are four sources of risk at programme level which arise from the programme components.

1. Programmes contain projects, and projects are risky, so at least some of the risks that can affect the programme will come from within the projects that constitute the programme. Of course not all project risks are relevant at programme level, so escalation criteria are required which will define the thresholds at which a project risk should be passed up to programme level. These criteria need to include project risks with programme-level impact, as well as project risks requiring programme-level responses.

2. It is also necessary to be able to aggregate project risks, where a number of similar and related risks at project level might combine to create a programme-level risk, either by simple summation (ten insignificant project risks may equal one significant programme risk), or as a result of synergy (the whole may be greater than the sum of the parts). Suitable risk categorisation schemes are required to facilitate such aggregation by identifying commonalities and possible synergies, and a generic programme-level Risk Breakdown Structure (RBS) may be used for this purpose.

3. There is a distinction at project level between individual “risk events” and overall “project risk”. The *Project Risk Analysis & Management Guide* from the Association for Project Management defines “project risk as “the exposure of stakeholders to the consequences of variations in outcome; the overall risk affecting the whole project, defined by components associated with risk events, other sources of uncertainty and associated dependencies, to be managed at a strategic level” (Association for Project Management, 2004). A similar definition is contained in the forthcoming *Practice Standard for Project Risk Management* from PMI, which says “Overall project risk represents the effect of uncertainty on the project as a whole. Overall project risk is more than the sum of individual risks on a project, since it applies to the whole project rather than to individual elements or tasks. It represents the exposure of stakeholders to the implications of variations in project outcome.” (Project Management Institute, 2008c). These definitions make it clear that “project risk” (or the risk **of** the project, as distinct from the risks **in** the project) will have an impact at programme level, and must therefore be considered within the scope of programme risk.

4. It is also important to remember that programmes can contain non-project components (see Exhibit 1), so risks may also be escalated and aggregated to programme level from these programme elements, and not just from projects.

Risks delegated from above

Programmes exist to deliver benefits which are aligned with the organisational strategy, and there are strategic risks associated with the overall direction of the organisation. While many strategic risks can and should be addressed wholly by the senior leadership of the organisation, some will have implications for those programmes which are used to deliver the strategy and create the business benefits. Strategic risks which can affect programme objectives or which require programme-level action will need to be delegated. This requires well-defined delegation criteria and thresholds, as well as clear channels of communication to ensure that management of strategic risks delegated to programme level is reported back to senior management. The goal is delegation without abdication.

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Risks arising at programme level

In addition to risks escalated from below or delegated from above, programmes are affected by specific uncertainties at the programme level. These include both threats and opportunities across the full range of risk types, including technical, management, commercial and external risks. Thiry has suggested that opportunities may be more relevant at programme level, due to the emerging nature of programmes (Thiry, 2009). Programme-level risks fall into two main categories: those arising from interfaces between programme components, and "pure" programme risks relating to the execution and management of the programme itself.

Managing programme risk

It is a common misconception to limit the understanding of programme risk management to the need for a structured risk process at programme level. While this is one part of the solution to the challenge of programme risk, it is not the first, and perhaps not the most important. In the same way that there are two levels of risk affecting projects as discussed above, namely overall project risk ("risk") and individual risk events ("risks"), programme risk management should occur in two main ways: implicit (addressing overall "programme risk") and explicit (tackling individual "programme risks").

Implicit programme risk management

Overall "risk" can be managed implicitly at programme level through the inherent structure of the programme itself. This occurs at two levels: component selection, and programme execution.

1. The components of the programme should be selected in order to maintain risk exposure at a level which is consistent with organisational risk appetite while offering the required return to the business. This "risk efficiency" approach has been promoted widely within project risk management (for example Chapman & Ward, 2003, 2004), based on the pioneering work of Markowitz (1959), and it is clearly also applicable to programme management, particularly in relation to selection of programme components. This element of the management of programme risk must be closely linked to the overall strategic risk process of the organisation, which will determine the selection criteria for programme components. The level of overall project risk exposure for each constituent project within the programme will form a key input to this analysis, and quantitative risk analysis techniques may be useful at this point. Overall programme risk should be reviewed and monitored on a regular basis throughout the programme lifecycle, as part of the routine management of the programme, and the composition of the programme should be adjusted as necessary in order to maintain an acceptable level of overall risk exposure within the programme.
2. Programmes are usually divided into chunks or tranches, in order to provide incremental delivery of useful packages of benefits. This division of the programme parallels agile or lean project development methodologies, and is intended to reduce the overall risk exposure of the programme. Risk can be reduced by decoupling the tranches, and creating so-called "islands of stability" (first described in Central Computer and Telecommunications Agency, 1994). This allows the programme to be executed in cycles, interspersed with periods of stability when benefits can be examined and quantified, and the next chunk can be planned in detail. Programmes should be structured with built-in flexibility and resilience in order to allow the content of future tranches to respond to the current level of risk exposure.

Explicit programme risk management

In addition to managing "risk" implicitly at programme level, there is a requirement to explicitly manage "risks" that emerge during the execution of the programme. This requires a structured programme risk management process analogous to the project risk management approach, which must iteratively identify risks, assess their significance and importance, develop appropriate responses, implement those responses, and monitor subsequent changes.

Many of the programme management guides and textbooks limit their descriptions of risk management to this type of explicit risk process, and most simply recommend adopting or adapting the methods of project risk management (examples include Murray-Webster & Thiry, 2000; Thiry, 2004, 2009; Project Management Institute, 2006a, 2008a; Reiss et al., 2006; Office of Government Commerce, 2007). While the structure of the programme risk management process matches that for projects, there are some important differences, as outlined below.

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- **Initiation/Risk management planning.** This step launches the risk process for the programme and defines the scope of the risk process, within which risks will be identified. Risk thresholds are set against each of the major programme objectives, against which risks will be assessed (a Benefits Breakdown Structure may be used for this purpose). Criteria are agreed for risk escalation, aggregation and delegation, as discussed above. Process parameters are defined, including roles and responsibilities, and review and reporting requirements. This is initially performed at programme launch, but should be revisited at key points during the programme lifecycle, to ensure that the programme risk process responds to the changing risk profile associated with the evolving and emergent nature of programmes. Initiation decisions should be documented in a Programme Risk Management Plan.
- **Risk identification.** Before the programme is launched, the level of overall programme risk will have been identified and assessed, using the implicit risk management techniques discussed above. Individual programme-level risks should also be identified as part of the explicit programme risk management process, both on a regular basis and ad hoc as they arise, taking account of the three routes by which such risks arise (see Exhibit 2). Risks may be escalated or aggregated from lower component levels, or delegated from higher strategic levels, and the programme requires clear criteria to determine whether these should be accepted for management at programme level. In addition to these, the usual risk identification techniques can be used to find programme-level risks, including brainstorming, checklists, assumptions analysis, Delphi groups etc. Risk identification at programme level should seek both threats and opportunities, and should consider the full range of potential risk sources defined in the programme Risk Breakdown Structure. Risks will be recorded in a Programme Risk Register.
- **Risk assessment/analysis (qualitative/quantitative).** Identified risks should be assessed and prioritised, based on their likelihood of occurrence (probability and/or frequency) and their impact on programme objectives. Risks escalated/aggregated from component level and risks delegated from strategic level will need to be re-assessed against programme-level risk thresholds to allow them to be prioritised on a common basis. Quantitative risk analysis techniques can be used to provide an overall assessment of programme risk exposure, combining the effects of all types of risk at programme level, and taking account of risk dependencies, and the results from this analysis should be fed into the implicit management of overall "programme risk" discussed above.
- **Risk response development.** Response to the overall level of programme risk exposure is handled through the implicit risk process above, by adjusting the programme composition to maintain risk efficiency. Explicit responses are also required for individual programme risks, and these match the options available at project level, including avoid/transfer/reduce/accept for threats, and exploit/share/enhance/accept for opportunities. Additional response options available at programme level include escalation of a risk to strategic level (where the impact affects strategic objectives and/or senior management action is required), and delegation of a risk to component level (where the primary impact and/or risk ownership is at a lower level), and suitable escalation/delegation criteria are required.
- **Risk review/Risk monitoring & control.** Risk is a dynamic challenge within programmes, and the programme risk process must be iterative in order to maintain an appropriate degree of attention to managing risks. Regular risk reviews must be held at programme level, usually as part of the routine programme management process, but the scope of these risk reviews must be rigorously controlled to avoid discussing project risks or strategic risks outside the scope of the programme.
- **Risk lessons learned.** When a programme is terminated it is important for the organisation to capture knowledge to benefit future programmes. A formal lessons learned workshop should be conducted, and risk must be considered as part of this exercise. It would also be useful to hold interim lessons learned workshops at key points during the programme lifecycle, to identify lessons that might be implemented in later phases of this programme, as well as benefiting other programmes.

Remaining challenges and way ahead

This paper has presented a structured approach to the management of risk on programmes, including both implicit management of overall "programme risk" through applying a risk-efficient approach to the construction and execution of the programme throughout its lifecycle, and also implementing an explicit programme risk process to address individual "programme risks" which arise from a variety of sources. Although the principles described here are clear, a number of challenges exist in ensuring that these are implemented effectively. These challenges are briefly outlined below.

- **Implementing risk efficiency.** Management of overall "programme risk" is an essential responsibility of the programme management team, and it depends on an understanding of the role of programmes in delivering strategic benefits to the organisation. Managing programme risk using the implicit techniques described above also requires an ability to turn the theory of risk efficiency into practice. Although the principles of risk efficiency have been known for 50 years (Markowitz, 1959), and their application to financial portfolios is well established, it is not always immediately clear how such an approach should be applied at programme level. In particular, there may be challenges in deriving the measures required to build and operate a risk efficiency model, and in understanding how to define the risk efficient frontier to reflect the risk appetite of key stakeholders for a particular programme.
- **Avoiding a project mindset.** Many of the existing programme management guidelines have been developed by organisations and practitioners who come from a project management background. As a result their departure point in terms of both thinking and process is the project mindset. This is particularly evident in the PMI approach (Project Management Institute, 2006a, 2008a) which has a programme risk process that mirrors the project risk process precisely (compare Project Management Institute, 2004), and it is also evident in the OGC recommendations (Office of Government Commerce, 2007). There are many pitfalls associated with taking a project-based view of programmes (Pellegrinelli & Partington, 2006), most of which arise from limitations in the underlying thinking. This is likely to remain a challenge for as long as the majority of programme management practitioners continue to come from the world of projects, or at least until the concepts and practice of programme management become better established.
- **Tailoring to different programme types.** There is no unitary concept of a "programme", and the term covers a variety of different configurations. Early work by Pellegrinelli described several types of programme (Pellegrinelli & Bowman, 1994; Pellegrinelli, 1997), including the portfolio, goal-oriented and heartbeat configurations, each of which has different characteristics, and consequently different risks. As a result, one might expect the challenges of programme risk management to differ between these various types of programme. This paper has outlined some generic features of risk management at programme level, but further work may be required to tailor the generic approach to particular programme types.
- **Lack of wider consensus on programme management.** Earlier sections of this paper outlined the ongoing debate about the nature and purpose of programmes and programme management, indicating the lack of consensus among key players and opinion-formers in the field. While this wider discussion continues at the level of programme management itself, it is unlikely that sufficient attention will be given to lower-level disciplines such as programme risk management. However this paper has shown that one key way to manage programme risk is through the implicit construction and execution of the programme, so risk management cannot be left until later, when the bigger debate is resolved.

Despite these challenges, there is no doubt that programmes are risky undertakings, and that successful programme delivery depends on effective programme risk management. Although there are similarities and parallels between the process for *explicit management of individual programme risks* and the well-established project risk management process, programme risks can arise from above and below the programme as well as within it, and the process must tackle all of these sources. In addition, programme risk management must encompass the *implicit management of overall programme risk exposure* through application of a risk-efficient approach to the construction and ongoing execution of the programme.

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