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▶ **PRINCE2 and RUP: Loose Coupling Works Best**

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This article describes how to combine the PRINCE2®¹ project management methodology with the Rational Unified Process,® or RUP,® to achieve a "best of both worlds" solution. It proposes a loosely coupled approach that minimizes the time, effort, and cost involved in integrating the two methods.

PRINCE2 (Projects IN Controlled Environments) provides a non-proprietary best practice approach for project management. The PRINCE2 method was developed by the CCTA (Central Computer and Telecommunications Agency), now part of the Office of Government Commerce (OGC), as a UK government standard for IT project management. It is being used successfully in both the public and private sectors.



The Rational Unified Process, or RUP, is a software engineering process developed by Rational Software, which is now part of IBM. RUP is founded on a set of software best practices (develop iteratively, manage requirements, use component architecture, model visually, continuously verify quality, and manage change) that in combination eliminate major development problems and enable teams to deliver better software.

Software development is not the primary focus for many of the projects run by large organizations. Figure 1 shows a project structure for a company working on improving customer service capability. This involves: feasibility work, increasing capacity by building new -- or improving current -- call center facilities; and upgrading telecom and IT infrastructure. Software development is only a small part of a much bigger

piece of work.

Organizations working on such complex projects often adopt a tiered approach to project management, with the upper tier responsible for the management and coordination of a disparate collection of suppliers, and a lower tier responsible for the creation of *specialist* products such as software. Typically, organizations manage the upper tier activities with a standard project management method such as PRINCE2.

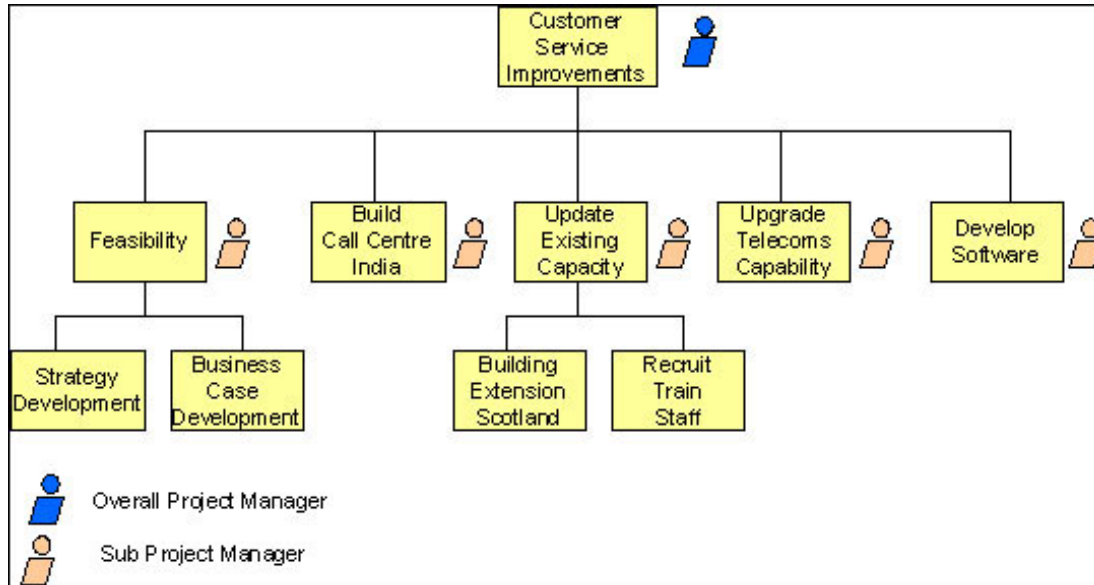


Figure 1: Tiered Project Management Structure for a Complex Project

However, many organizations that have adopted PRINCE2 perceive great value in RUP's iterative, risk-driven approach to software development, which enables them to exert greater control over software development projects through early discovery of risk, improved scope management, and greater visibility of progress and quality.

Although, as Figure 2 shows, PRINCE2 and RUP are mainly complementary -- because RUP focuses primarily on specialist activities such as business modeling, design, and architecture -- there is some overlap between the two processes with respect to:

- Project Organization and structure
- Documents
- Planning components (e.g., risk management, problem management, quality management, etc.)

In suggesting ways to resolve this overlap when integrating PRINCE2 and RUP, the suggestions in this article will focus on three primary areas:

- Process model alignment and integration: the impact of RUP on the PRINCE2 process model.
- Documentation: resolving discrepancies between RUP and PRINCE2 documentation.

- Organization: . the impact of RUP on the PRINCE2 organization structure.

The in-depth tailoring of specific activities, documents, and roles is outside the scope of this article.

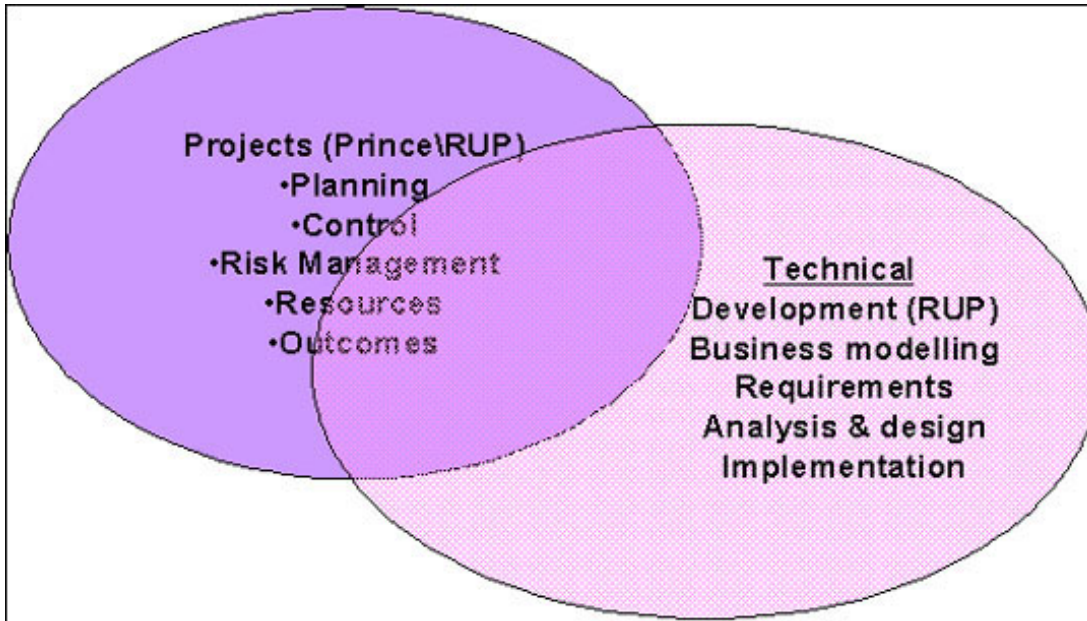


Figure 2: PRINCE2 and RUP Are Mostly Complementary

The next section examines adoption strategies for integrating PRINCE2 and RUP.

Adoption Strategy for PRINCE2 and RUP

At Ortia, we have defined the following principles for PRINCE2/ RUP integrations:

- *Keep it simple.* The integrated process should be understandable to both the PRINCE2 and RUP communities.
- *Make it "do-able."* The process should be easy to implement in a short time frame with the minimum amount of effort.
- *Maintain separation of concerns.* RUP focuses on the development of software products, and PRINCE2 focuses on the non-technical aspects of the project; the integration should not muddy these distinctions.
- *Maintain flexibility.* The integrated process should permit additional methods to be used with PRINCE2 and RUP.
- *Create synergy.* The integration should result in a "best of both worlds" solution that emphasizes each method's strengths.

These principles explain why we recommend a loosely coupled integration strategy, as shown in Table 1.

Table 1: Possible Integration Strategies

Strategy	Description	Simple	Do-able	Separation Of Concerns	Flexibility	Synergy
Loosely Coupled integration	PRINCE2 treats the software development project as a third-party entity and manages it via the "Managing Product Delivery" process.	√	√	√	√	√
Merged	The two methods are tightly merged	no	no	no	√	√
Replacement	PRINCE2 completely replaces the RUP Project Management Discipline	no	√	no	√	no

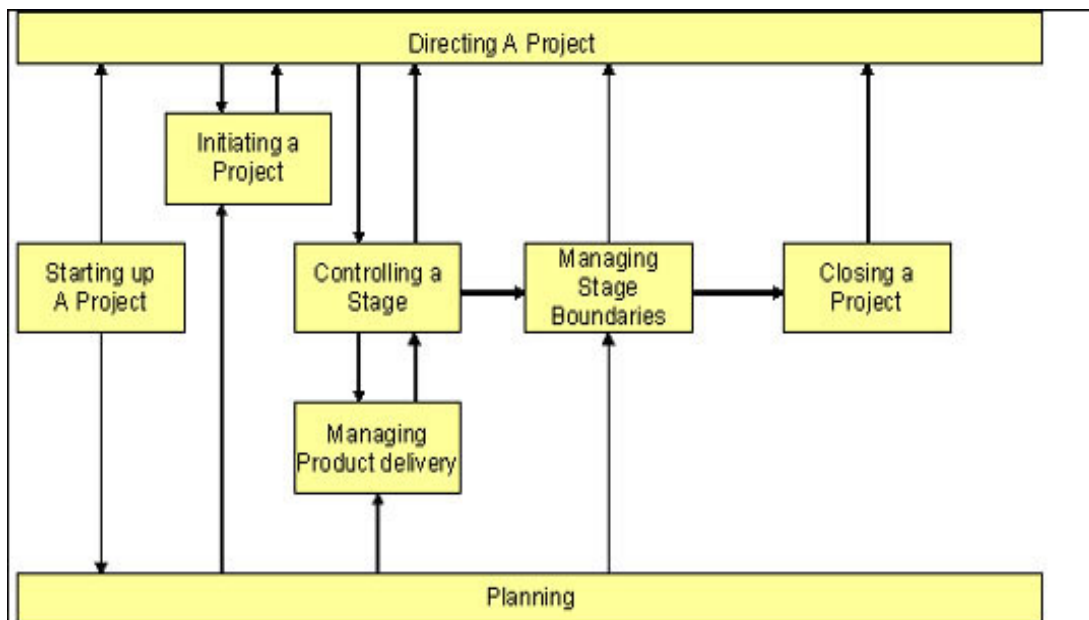
As you can see, the loosely coupled strategy aligns with all the principles. We have seen this approach work successfully in real world projects. And because it supports the integration of additional methods, it is a useful approach to adopt on complex projects involving a number of third parties using disparate methods.

Process Model Integration

This section outlines the alignment between the PRINCE2 process model and RUP.

The PRINCE2 Process Model

Figure 3 shows the PRINCE2 Process Model, including the path and sequence through various project activities to produce a final product.



Source: *Managing Successful Projects with PRINCE2*, UK Office for Government Commerce (OGC), 2002

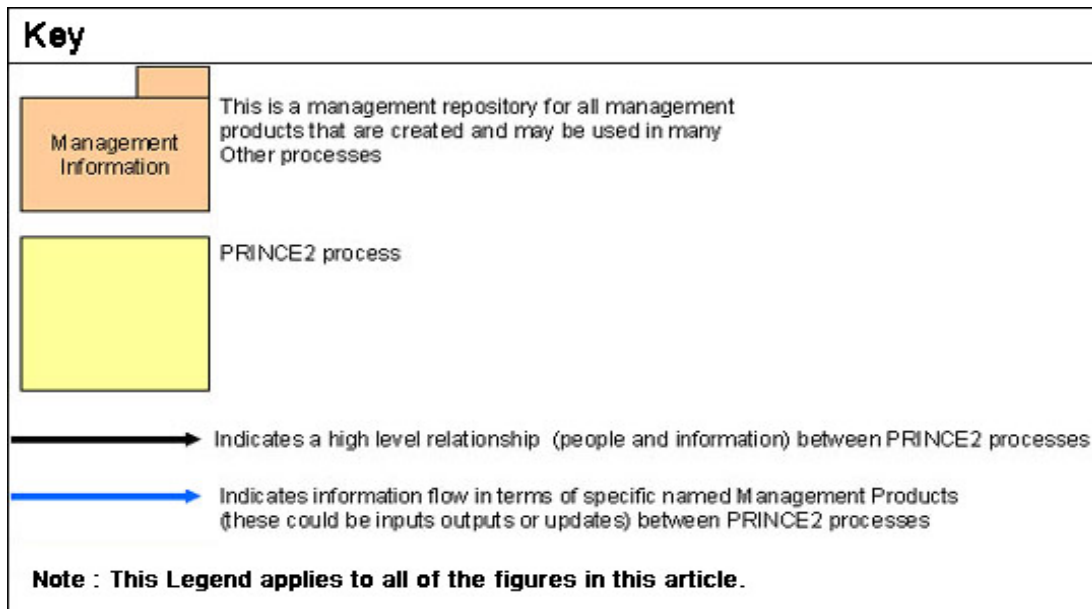


Figure 3: PRINCE2 Process Model

Table 2 provides a brief overview of these activities.

Table 2: Overview of Project Activities Defined in PRINCE2

Activity	Description
Directing a project	This is concerned with the high-level governance of the project; i.e., it runs for the whole life of the project.
Starting up a project	This encompasses the pre-project work that includes identifying a project and ensuring that project prerequisites are in place (i.e., organization, people, documentation etc.).
Initiating a project	This process covers the initial planning and definition of the project in terms of, for example, business case, costs, and so on.
Planning	This activity outlines how plans will be drawn up at various stages of the project.
Managing stage boundaries	This provides senior management with key decision points to assess the continued viability of the project against the business case.
Controlling a stage	This is concerned with the day-to-day management of the project.
Managing product delivery	This activity is concerned with the allocation of work to the project team, ensuring that the work is carried out, and that it meets the defined quality criteria.

Closing a project	The purpose of this activity is to carry out a controlled finish to the project, including post-project reviews.
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The next section will explain what *stages* mean in the PRINCE2 context.

PRINCE2 Stages

In PRINCE2, a stage is defined as:

- A division of the project for management purposes.
- A collection of activities and products that can be managed as a unit.

A project board³ grants formal approval for the project to continue, one stage at a time.

In PRINCE2 there are two types of stages:

PRINCE2 recognizes that all the planning cannot be done up front and that it is sensible to plan in detail only for a limited planning horizon. So, just as in RUP, only the current stage is specified in detail; detailed planning for the following stage is done just before the end of the current stage. The project board exerts control over the project by approving all major plans, conducting reviews at each management stage, signing off the completion of each stage and authorizing the start of the next stage, and acting as the final escalation point for major risks, issues and changes.

The next section will show how PRINCE2 management stages can be aligned with RUP phases.

Aligning PRINCE2 Stages with RUP Phases

The PRINCE2 process model allows for great flexibility in establishing stages. In fact, PRINCE2 mandates only the initiation stage, which covers initial planning and definition for the project; other stages are defined at the discretion of the organization.

Figure 4 shows an alignment of RUP phases and PRINCE2 stages that emphasizes the following points:

- PRINCE2 planning covers the entire lifecycle. Incorporating RUP, an iterative process, means some of the PRINCE2 planning becomes more iterative as well -- that is, as each software iteration is completed, project managers should review, revise, and detail appropriate PRINCE planning documents accordingly.
- Overall project governance (i.e., high level objectives, business case approval, funding, resource allocation, go/no go decisions) are

undertaken by the project board and not by project management.

- PRINCE2 project management (at a high level) directs and monitors the software development effort.
- RUP planning manages the software development aspects of the project at a day-to-day team level.
- RUP phases roughly equate to PRINCE2 management stages.

Note that a number of other teams may be involved, who may or may not be using RUP.

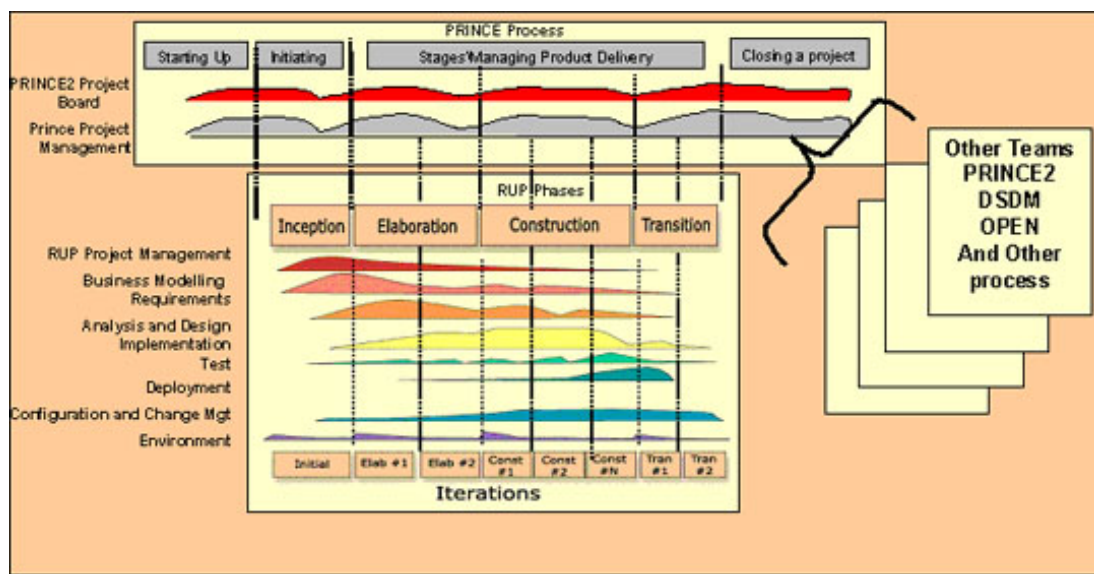


Figure 4: Alignment of RUP Phases and PRINCE2 Stages

The idea of the alignment is to assign high-level governance and management of the project to PRINCE2 and the management of iterative development and incremental delivery to RUP.

Detailed Process Model Integration: The PRINCE2 Perspective

This section takes a more detailed look at how to integrate the PRINCE2 process model and RUP.

Integrating Stages and Iterations

The PRINCE2 activity Managing Product Delivery (MPD), shown in Figure 5, allows a controlled break between the project manager and the creation/provision of a product by (internal/external) suppliers. The supplier may not be using PRINCE2, so MPD defines the required interface between the team manager and the PRINCE2 method.

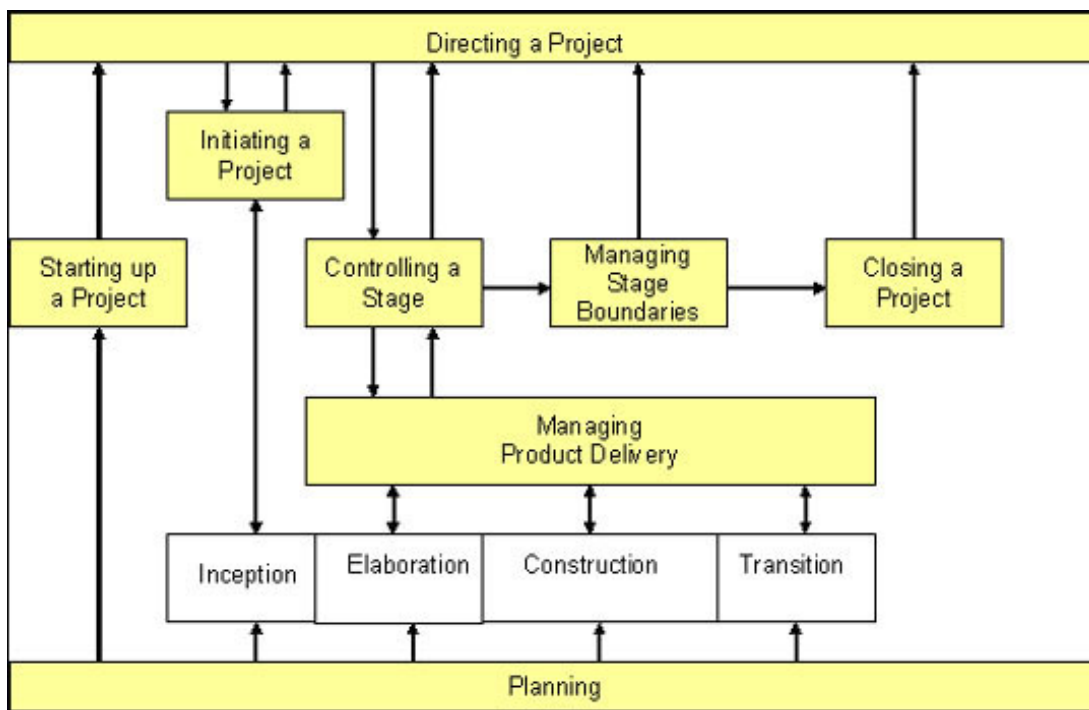


Figure 5: Interfacing Managing Product Delivery (MPD) in PRINCE2 with a RUP Project

By treating the RUP project as a supplier to the PRINCE project, the acquiring organization can use the MPD interface to manage aspects of the RUP project. The main advantages of this approach are:

- It minimizes the tailoring effort required for the two methods.
- It enables iterative planning to take place in the context of overall control, as we discussed above.
- The loose coupling between PRINCE2 and RUP permits the integration of additional methodologies.

The PRINCE2 project manager approves work by authorizing work packages. A work package is a set of information about one or more required products assembled by the PRINCE2 project manager and is used to delegate responsibility to a team manager. Although the content of a work package may vary greatly according to the formality of the relationship between the project manager and the team manager, it should cover:

- Date
- Team or person authorized
- Work package description
- Product description(S)
- Techniques/processes/procedures to be used
- Interfaces to be satisfied by the work
- Interfaces to be maintained during the work (risks, issues, change control, quality)

- Quality checking method to be used
- Stage plan extract
- Joint agreements on effort, cost, start and end dates
- Sign-off requirements
- Work return arrangements
- How completion is to be advised
- Any constraints to be observed
- Independent quality checking arrangements
- Reporting arrangements (progress/tracking)

The team manager is empowered to delegate and schedule the team-level work at his/her discretion. Depending on individual circumstance, the work package can range from a verbal instruction to a full-blown document.

Managing Product Delivery consists of the following three processes:

- *Accepting a work package.* This means the project manager and the team manager reach agreement on what is to be delivered.
- *Executing a work package.* Creation and management of the work is delegated to the team.
- *Delivering a work package.* The team manager notifies the project manager that the work package is complete.

The following sections explore these processes in more detail.

Accepting a Work Package. Figure 6 shows the process by which the work package is allocated to a RUP team manager.⁴

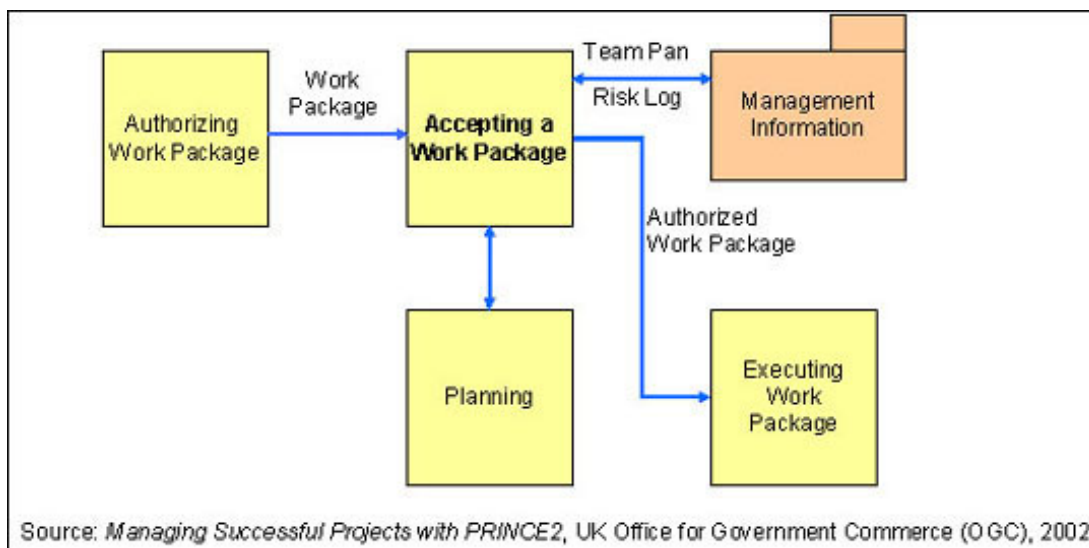


Figure 6: Accepting a Work Package

The RUP team manager has to agree on the work package with the project

manager. This involves producing and agreeing on a team plan that shows that the work package can be completed within the specified constraints for schedule, cost, and quality.

The work package is focused at about the same level as a RUP phase: It outlines the major goals and deliverables to be achieved. The software development plan that the RUP team manager returns will constitute the team plan.

Executing a Work Package. Figure 7 shows the process of executing a work package.

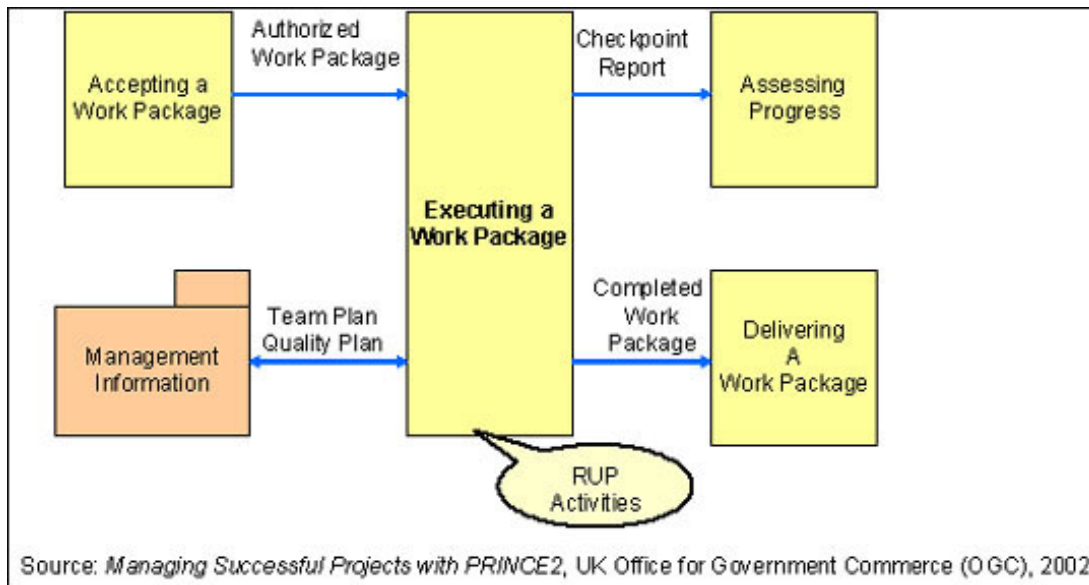


Figure 7: Executing a Work Package

The actual execution of the RUP disciplines takes place in the Executing a Work Package process. The RUP team manager is assigned responsibility for managing, co-ordinating, tracking, and reporting on the software development work. Under normal circumstances, the PRINCE project manager is not concerned with the detailed activities occurring in this black box, but only with the information and products coming out of it. If progress is not being made or the development team is having difficulties, then the project manager and team manager need to draw up and agree upon an exception⁵ plan. The information the project manager requires to monitor progress for the work package is provided by the RUP team manager. This means the team manager must:

- Capture and record the effort expended.
- Determine the status of each product in the work package -- use cases, for example.
- Monitor and control the risks associated with the work package.
- Evaluate the amount of work remaining.
- Feed the progress and status information to the PRINCE project manager in checkpoint reports.
- Ensure that the required quality checking procedures are carried

out.

- Report any issues\ risks.
- Report any change requests.

Delivering a Work Package. Figure 8 shows the process of delivering a work package.

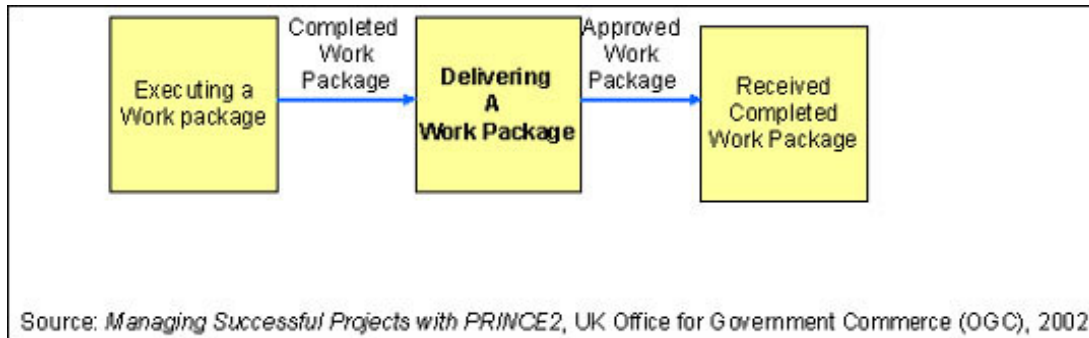


Figure 8: Delivering a Work Package

The RUP team manager must notify the PRINCE project manager when the work package is complete.

Typically, this involves three elements:

- Ensure that the products have been quality checked.
- Hand over the completed products; return of the approved products will be handled by the project's Configuration Management System.
- Notify the PRINCE project manager that the work package is complete.

The level of formality for this process depends upon:

- The size and complexity of the project.
- Whether the software development has been outsourced (which demands a higher formality level than for "in house" development).

Integrating PRINCE2 and RUP Documents

Figure 9 shows that there are different levels of plans and documentation at the project and team levels. In general the lower the level of the plan the greater the detail contained within the plan.

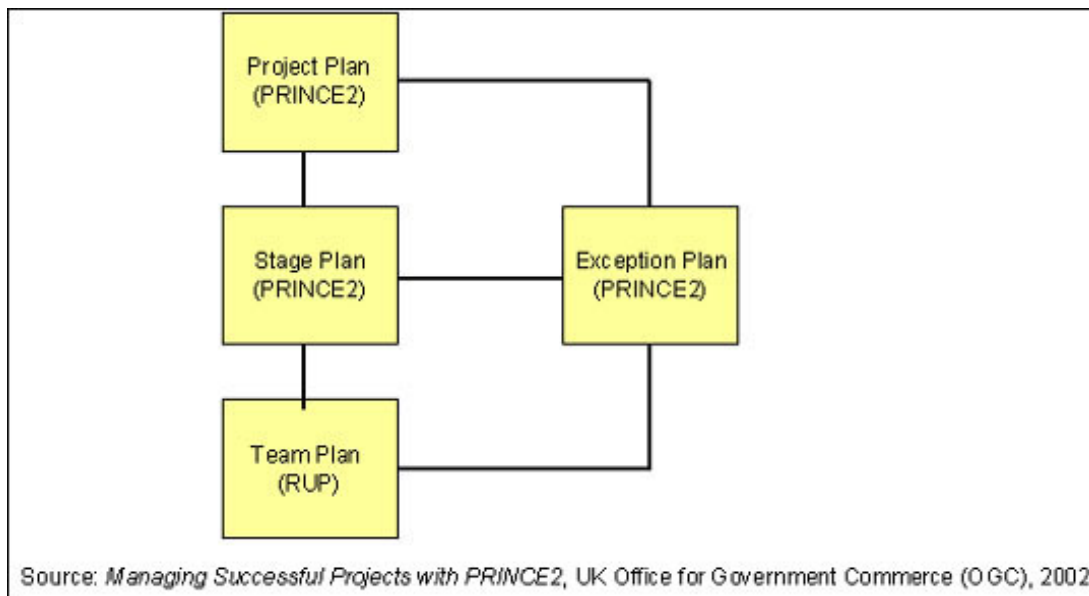


Figure 9: Levels of Planning and Documentation for an Integrated Process

For PRINCE2/RUP integration, the general strategy with regard to documentation is that:

- PRINCE2 provides the planning documentation at the project, stage, and exception levels.
- RUP provides the planning documentation at the team level to support the development of software products.

Exception plans are jointly agreed upon by the project manager and the RUP team manager.

Project Level Documents

As Table 3 indicates, most PRINCE2 planning documentation can be retained for planning the overall project. However, the RUP Configuration Management Plan document is more technically detailed than the PRINCE2 equivalent and therefore can replace it. It is also important to note that RUP is an iterative process, so integrating PRINCE2 and RUP means that many planning documents become, in a sense, works in progress throughout the project lifecycle. The PRINCE2 project team may need to adjust plans in response to the state of the software under development, and some team documents, such as software iteration plans (see Table 4), are not developed in detail until shortly before the iteration is scheduled to begin.

Table 3: Project Level Documentation for PRINCE2 and RUP Integration

Start Up	Initiation (Inception)	Stages (Elaboration, Construction, Transition)	Closure
Project Mandate (P)	Project Initiation Document (P)	Work Package (P)	Project Notification Closure (P)
Project Brief (P)	Quality Plan (P)	Checkpoint Report (P)	Post Project Review (P)
Risk Log (P)	Business Case (P)	Highlight Report (P)	Follow-On-Actions Recommendations (P)
Project Approach (P)	Communication Plan (P)	Project Communications (P)	End Project Report (P)
Acceptance Criteria (P)	Issue Log (P)	Lesson Learnt Report (P)	
Initiation Stage Plan(P)	Project Filing System (P)	Stage Plan (P)	
	Project Plan (P)	End Stage Report (P)	
	Quality Log (P)	Exception Plan (P)	
	Configuration Management Plan (R)		

Key	
	Overlap resolved in favor of PRINCE2
	Overlap resolved in favor of RUP
	No major overlap
P	PRINCE2
R	RUP

Team Level Documentation

Table 4 shows RUP planning documentation for the team level. RUP documents with a broader focus -- for example, the Business Plan, Quality Plan, and Project Plan have been pushed up to the project plan level.

Table 4: Team Level Documents

Initiation (Inception)	Stages (Elaboration, Construction, Transition)
Software Development Plan (R)	Iteration Plan (R)
Risk Log (P)	Iteration Assessment (R)
Issue Log (P)	Work Order (R)
Acceptance Criteria (P)	
Project Measurements (R)	
Measurement Plan (R)	

Key	
	Overlap resolved in favor of PRINCE2
	Overlap resolved in favour of RUP
	RUP artifact re-scoped to team level
	No major overlap
P	PRINCE2
R	RUP

PRINCE2 also defines methods for risk management and issues management, so the RUP risk and problem management documentation is not required.⁶

Organization

Figure 10 shows a proposed structure for a PRINCE2 project that is integrating RUP. There are two levels in this structure -- project and team - - and the roles are split as follows:

- PRINCE2 defines the project manager role.
- The RUP project manager role maps to the PRINCE team manager role; a team manager is responsible for a team that produces specialist products such as software.
- The PRINCE configuration librarian role maps to and replaces the RUP configuration manager role.
- Team members in other specialist roles, such as system analyst, report to the RUP team manager.

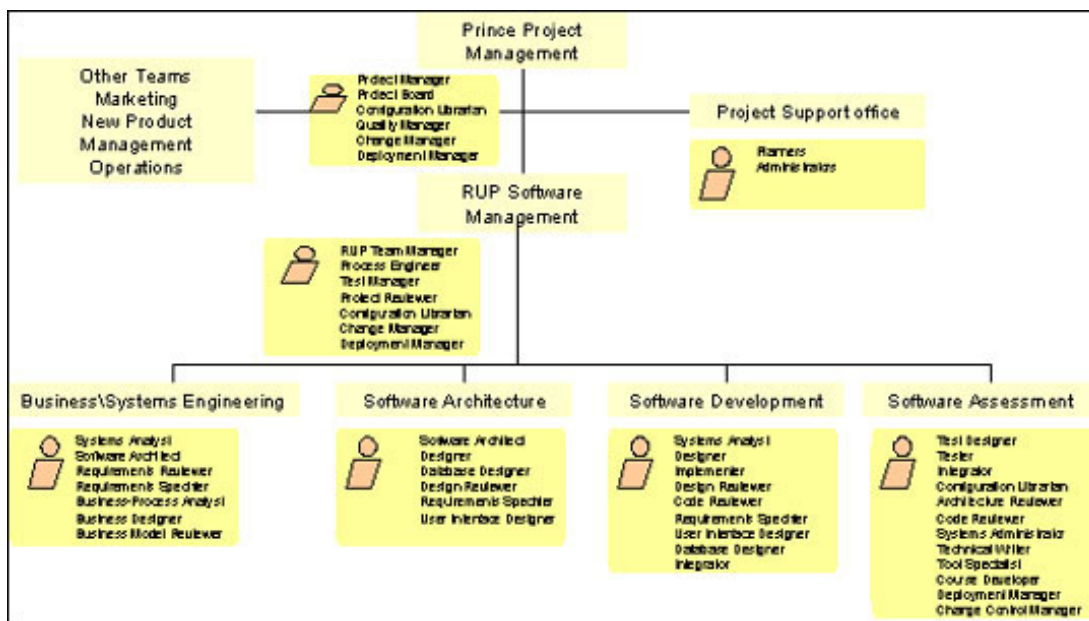


Figure 10: PRINCE2/ RUP Organization Structure

Loose Coupling Makes a Strong Process

This article has discussed the desirability of a loosely coupled integration of RUP, the way to merge the RUP and PRINCE2 project management documentation sets, and the impact of RUP on the PRINCE2 organization structure.

The benefits of this integration approach include:

- *More leverage for your PRINCE2 investment.* You can use your existing process, and "you don't have to throw the baby out with the bath water."
- *A best of both worlds solution.* You get the "big picture" control PRINCE2 provides for overall project management, plus RUP's iterative approach, which is suitable for developing a creative product such as software and may apply to other aspects of the project as well.
- *A simple solution.* The integrated process is understandable to both PRINCE2 and RUP communities and reduces the learning required by each practitioner.
- *A "do-able" approach.* The integrated process is possible to implement within a short time frame with a minimum amount of effort.
- *Separation of concerns.* RUP focuses on the development of software products, and PRINCE2 focuses on the non-technical aspects of the project.
- *A flexible, open process.* Loose coupling allows other methods to be used with PRINCE2.

A loosely coupled approach to the integration of PRINCE2 and RUP can

speed up the tailoring effort, reduce costs, and leverage your investment in existing PRINCE2 skills and experience.

Notes

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² PRINCE2 uses the term *specialist* to denote any activities or deliverables produced outside the scope of PRINCE2.

³ The project board provides overall direction and management for the project. An equivalent body in RUP is the project review authority.

⁴ The team manager on a RUP project is typically the project manager.

⁵ When there is an indication that a plan is predicted to exceed significantly the agreed time and cost, an exception plan is produced. The exception plan takes over from the plan it is replacing and contains additional information on the cause of the exception.

⁶ These PRINCE2 documents (and others) are also upward-compatible with program management, where a program is a portfolio of projects that collectively deliver the required outcome. See OGC's *Managing Successful Programmes* at <http://www.tso.co.uk/bookshop/bookstore.asp?FO=39139>



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