Integrating PRINCE2 and Scrum
for successful new product development

G J Rankins   M Kearns

CPPD MApplSc MBA

Abstract

Today's business environment demands shorter time to market for new products and services along with early benefit realisation. In an effort to meet demand, project teams are realising that success can only be achieved through a more collaborative approach and a willingness to commence without a detailed understanding of requirements. Clients often don't know what is required to achieve a business objective until they actually see a working prototype, which may then have to be rapidly adjusted to the clients' emerging understanding. To enable a client to attain the maximum return on investment in every product development, there must be an acceptance of change throughout the life cycle of a project. In fact, the complexity and uncertainty associated with such emergent projects may mean that a final set of requirements may not be known until the end of the project.

This paper is the result of collaboration between an experienced PRINCE2 project manager and trainer and a qualified coach and trainer in the Scrum method, in analysing the application of PRINCE2 and Scrum in an actual project environment. We provide an analysis of those areas where conscious decisions appropriate to each project and each organisation will have to be made. The careful and tailored application of Scrum and PRINCE2 can create a synergy that results in a dynamic yet controlled product development environment.

Key words: PRINCE2, Scrum, synergy, product development

1.   Introduction

PRINCE2 is a project management method that was specifically designed to be generic, scalable and independent of any particular project type or product development method. It's a method that supports organisational control over investments in projects. It comes with a process model and a set of supporting knowledge areas and predefined roles. But it's also a very pragmatic method. For example, it regards estimates, of both costs and expected benefits, as always carrying a level of uncertainty that needs to be recognised and tolerated. It regards planning in detail too far in advance as probably nugatory, particularly in relation to new product development. Tailoring PRINCE2 to the organisational context and scaling it to suit the project in hand is critical to its success.

Scrum is an holistic approach to new product development which increases speed and flexibility. It is a process skeleton that includes a set of practices and predefined roles. The development process is performed by a cross-functional team across overlapping phases, in a concentrated effort termed a 'sprint'. A sprint is a guaranteed time allocation where interference from change and other interrupting factors is removed to allow developers to concentrate on a single deliverable: the sprint goal. Scrum accepts that a new product development cannot be completely understood or fully defined up-front, and that requirements will change over time. Scrum's purpose is to maximize the

development team's responsiveness to change, and to produce a working product increment which is demonstrated to and accepted by the client in every sprint. The concepts of self-directing and self-organising teams are central to the approach. Using the law of averages and an appreciation of progress against rate of change, an end date will be forecast.

2. Why is there a need to combine the methods?

PRINCE2 does not require that any particular development method should be used by the teams developing new products. It does require that the work of the team be specified in advance, that it be adequately tracked while the work is being carried out, that developed products satisfy quality criteria and that products are correctly handed back to the project on completion.

PRINCE2's primary focus is on the management and governance that surrounds a project. It in no way constrains a development team as to how they should work and what tasks they must do in what order. After grouping functionality into work packages against which progress will be measured, the development team is empowered to select for itself the best way to complete the work defined in a package. Scrum provides a framework to the development team for most effectively delivering the work package.

Through a merger of the two approaches an optimum solution development approach to product development can be created. Scrum provides a framework to plan and assign tasks correctly, manage change appropriately and maintain a constant reflection on work package progress.

Project Governance is required and questions such as the following must be answered:

- Are the goals and objectives of the suggested idea in line with company strategy?
- Do we have the capability to deliver?
- Who has the final decision rights to approve the go ahead and apportion company budget to a project?
- Under what framework will the project be governed?

Agile principles and processes do not facilitate answering such questions. Appropriate governance processes must operate to minimize risk and increase project success; these are provided by PRINCE2.

An agile product development process provides the project with a mechanism to manage emerging requirements and maintain close collaboration between suppliers and users. Team productivity will be impacted by the use of an overly bureaucratic development process, such as a waterfall approach that isolates functional skill sets through a sequential development lifecycle process. Agile approaches provide a flexible alternative that supports stronger control mechanisms in product development.

Estimates are educated guesses, not promises. PRINCE2 recognises this and recommends the use of tolerances around budget and schedule estimates. Scrum's approach is to make an initial informed guess about velocity (the pace at which the team will be able to deliver functional increments) and adjust this planning figure at the end of each sprint.

3. Integrating PRINCE2 and Scrum roles

The key development roles defined in PRINCE2 are the Senior Users, the Project Manager and the development Team Leader(s). In the Scrum method, the key roles are the Product Owner, Scrum Master and Agile Project Manager.

Each role described above has different responsibilities and all have a good reason to be created within a project. How those roles are best combined will depend of the skills and personalities of the individuals in the development team.

The roles of Scrum Master and Agile Project Manager in the Scrum framework exist to facilitate and assist the team to develop into a self-organising and self-directing unit, and to be responsible for managing external dependencies. Individuals with a preference for a command-and-control style of management will inhibit the generation of an organic team and will not be suited as Agile Project Managers or other roles associated with managing a work package.

It is possible to map the Scrum role of Product Owner to the PRINCE2 governance role of Senior User, however, there is a need to modify the Senior User role description to ensure that the incumbent understands the responsibilities of the Product Owner in Scrum. For smaller projects, since the Senior User and Executive roles in PRINCE2 may merge, the Executive would act as Product Owner.

It may be possible to map the Scrum role of Scrum Master onto the PRINCE2 role of Project Manager, but only if the individual understood the role as supporting and empowering the development team, rather than directing their work practices. If the Project Manager could not adapt their style to the nature of the Scrum Master role, then it would be better for another individual to take the latter role. In PRINCE2, this role would then be seen as being one of several possible support roles within a Project Support Office.

Even in Scrum someone must track costs, report to the Project Board, and deal with exceptions and other issues, which fall outside the role of the Scrum Master, whose role is focussed on ensuring that the development team understands and works toward the sprint (i.e. Work Package) goal, removing all impediments the team has raised. With respect to product development, traditional project managers can provide a support role around some of the administrative gates products must pass through.

4.   Controls

4.1   Scrum as a form of control

The use of Scrum by a product development team is a response to an uncertain situation where the scope of the product to be developed may not be full specified, but rapid progress is required. By adjusting the scope of a sprint on the basis of the productivity demonstrated by the team during the previous sprint (its velocity), the result to be achieved in subsequent sprints becomes more predictable.

4.2   Dealing with uncertainty

PRINCE2 uses the concept of tolerance to allow the Project Manager some freedom to respond to the inherent uncertainty of estimates.

Scrum adjusts the scope of subsequent sprints to suit the velocity able to be achieved by the available resources in the team. In Scrum, it is accepted that accuracy can only be achieved through experience, not better estimating techniques.

4.3   Dealing with change

While both PRINCE2 and Scrum recognise that change is inevitable, they handle change in different ways. In PRINCE2, approval of a change may increase scope, budget and duration of a Stage. In Scrum, the duration of a sprint is held constant; change is accommodated by holding sprint duration constant and varying scope and/or budget.

Where it is likely that not all backlog items with be completed in a sprint, the Scrum Master may reduce scope by removing items from the sprint backlog. Conversely, where it becomes apparent that the team will be able to deliver more in a sprint than originally estimated based on the velocity obtained by the team in the previous sprint, the Scrum Master may add items to the sprint backlog.

The approach to change in PRINCE2 is more formal, involving a change control technique and possible a change authority with a change budget. Approval of a change will generally involve an increase in the duration of a Stage and in its associated budget, or the removal of a lower priority requirement from the scope of the Stage. The latter is analogous to the Scrum approach, however the Product Owner has the final say in all changes in scope, and changes suggested by a Scrum Master must be first agreed with the business (through the Product Owner). Transparency is ensured in Scrum through the clear definition of key roles.

4.4 Dealing with issues and exceptions

In PRINCE2, issues include problems impacting or arising from product development. An exception is a situation where it is predicted that an allowed tolerance around a target for budget, duration, quality, risk, etc will be breached at the end of a Stage. The exception situation is recorded as an issue. Formally, a Stage which is in exception is prematurely terminated, an impact analysis is required, and a replacement Stage Plan may be requested by the Project Board.

In Scrum, issues impacting product development are referred to as impediments. Where an impediment to completing the backlog allocated to a sprint cannot be removed, the sprint may be terminated.

In both cases, the exception is intended to return control directly and publically to those governing the project, so that critical decisions can be made transparently and corrective action taken.

5. Issues at points of intersection

5.1 Product Descriptions, Work Packages and the definition of 'done' for sprint products

In PRINCE2, a Product Description is a specification of a product. For example, there must be a Product Description of the final product of each Stage. Scrum provides the team with the ability to revise scope before commencement of each sprint in a Stage, in light of the velocity achieved over previous sprints and the team's view as to whether the goals of the stage can be achieved within the timeframes given. If there were to be multiple sprints in each Stage, then the question arises as to how to define the final product of the Stage in this environment of variable scope.

Also, there remains the necessity of adequately testing and correctly handing over completed artefacts developed by the Scrum team, which carries with it the requirement of specifying quality criteria and other completion criteria. In PRINCE2 this is achieved via completion criteria specified in Product Descriptions and Work Packages. If the Release backlog was contained in the Composition section of the Product Description, and if formal change control were used to vary this backlog in view of the velocity achieved in the early sprints of the stage, then the needs of both methods will have been served. The handover criteria specified in the Work Package for a sprint will always include the necessity of completion of required quality control activities. The Project Quality Plan would need to reflect these arrangements.

5.2 Communication

The communication plan of agile projects is extremely important, particularly because of the need to manage the expectations of stakeholders with no prior exposure to agile methods such as Scrum. These stakeholders include those will use the final products of the project, where the scope of these products cannot be known in advance.

6.   Overlaying process models

The following diagram indicates the key points at which the PRINCE2 process model has to be modified to reflect the needs of the Scrum approach to product development.
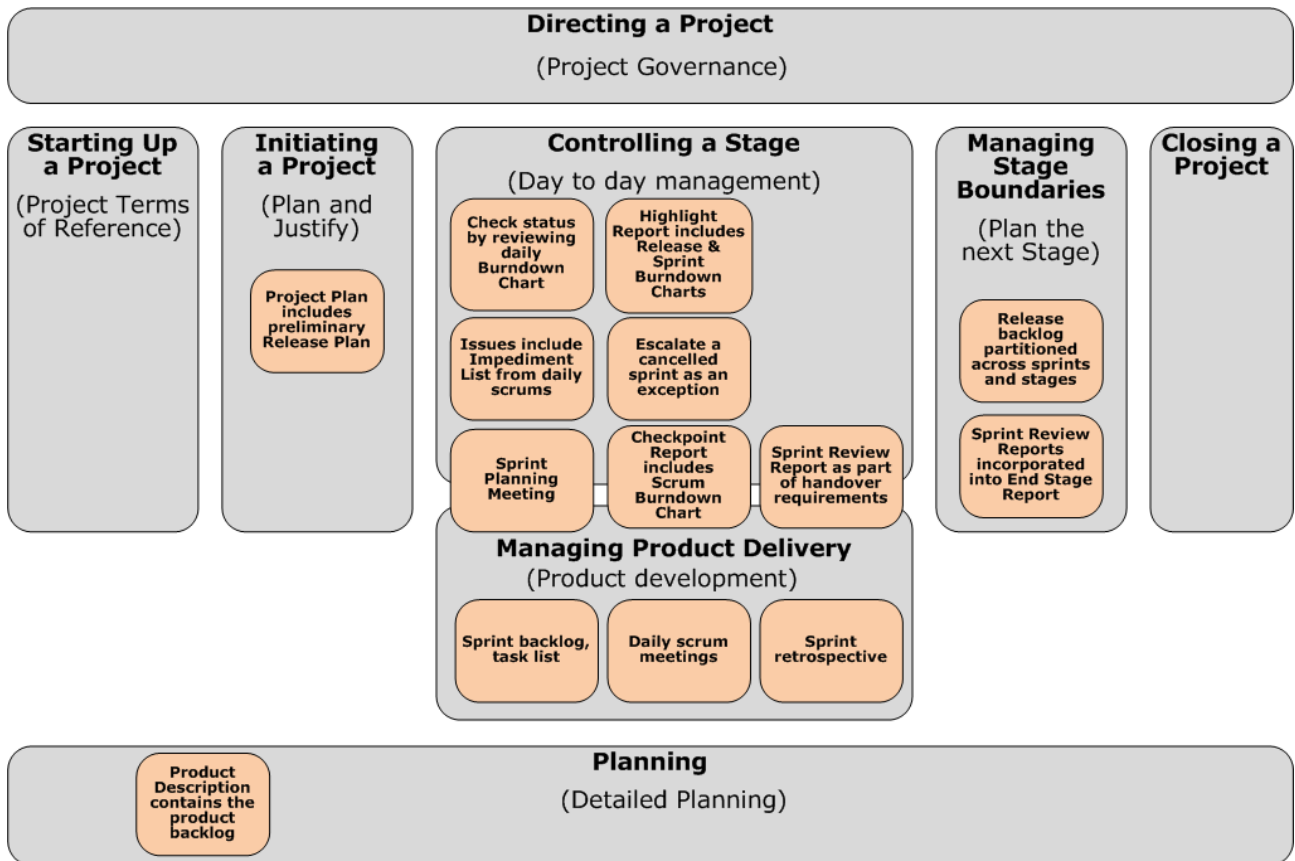

Figure 1   Integrating PRINCE2 and Scrum Process Models

These key integration points (the highlighted boxes in the above diagram) include:

- The Project Plan in PRINCE2 is a high-level plan covering the entire life of the project. Detail is developed in Stage Plans in a just-in-time manner. If Scrum is to be used for product development, then the Project Plan should include a preliminary Release Plan.

- In developing Stage Plans, the Product Description of the final product of the Stage would now include details of the backlog to be addressed in developing this product.

- The Work Package, negotiated between Project Manager and Team Leader (or Iteration Manager) in a sprint planning meeting, would now include details of the backlog to be addressed by the sprints covered by the Work Package, as well as completion criteria such as required quality criteria and the quality review method to be used.

- The development team will hold daily Scrum meetings, at which impediments to the team's progress will be raised, an recorded as a project issue. While there is nothing to stop an impediment being raised at any time, the value of the daily standup meeting is that the Scrum Master will be aware of the impediment within no more than a 24 hour lag.

- At a frequency determined by the Project Manager, the Scrum Master will provide a Burndown Chart in a Checkpoint Report to indicate progress to date against the expected team velocity.

- At the completion of a sprint, the completed products would be returned to the Project Manager with whatever handover artefacts (such as proof of product quality and customer acceptance) specified in the Work Package.

- In addition, at the end of each sprint, the team would conduct a Sprint Retrospective to review the current sprint for lessons learned to improve the conduct of future sprints.

- Where an impediment cannot be resolved, the Project Manager will escalate it to the Project Board for resolution.

- In assessing Stage status, the Project Manager will use the sprint and release Burndown Charts as one source of information for inclusion in Highlight Reports.

- At the end of a Stage, the Project Manager will incorporate Sprint Review Reports into the End Stage Reports.

- In planning the next Stage, the Project Manager will work with the Scrum Master and development team to confirm the expected velocity of future sprints and allocate release backlog elements to sprints in the next Stage.

7.   Conclusion

Various issues arising from integrating the PRINCE2 and Scrum methods are discussed. With careful thought and an adequate understanding of the principles of PRINCE2 and Scrum, the two methods can be integrated in such a way that the organisation as a whole remains in control of the project, while allowing the sprint team to adjust the scope of sprints in a flexible manner, while still meeting the priority needs of the responsible Product Owner.

The inherent flexibility of both PRINCE2 and Scrum allows for optimum performance of product development teams within a controlled project environment.

Author Bios

Geoff Rankins has been a practicing project management professional for almost 30 years. He has developed a broad understanding of portfolio management methods through hands-on experience and specialist research. Geoff is a member of PMI, and an accredited trainer and consultant in PRINCE2 and MSP. As well as his ongoing contribution to real-world programs, Geoff now offers specialist services in project and program management as a consultant, coach, trainer and presenter.

L: www.linkedin.com/in/geoffrankins
W: www.AspireAustralAsia.com.au
W: www.InspiringProjects.com.au