

Comparison of project management methodologies: prince 2 versus PMBOK for it projects

Ersin Karaman, Murat Kurt

Atatürk University, Faculty of Business and Administrative Sciences, Management Information Systems
Department, Erzurum, Turkey

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Abstract: Project management methodology provides a guideline for managing the projects and it is one of the important factors for successful completion of the projects. Project Management Body of Knowledge (PMBOK) and PRjects IN Controlled Environment Version 2 (PRINCE2) are most widely used project management methodologies in the world. The aim of this study is to compare PRINCE 2 and PMBOK to identify the characteristics of these best practices in order to provide decision criteria for organizations with regard to selecting IT project management methodology.

Keywords: IT Project Management, Project Management Methodologies, Project Management Best Practices, PMBOK, PRINCE2, Decision Support for Methodology Selection

1. Introduction

Project management has emerged as a separate discipline in 1960's and project management methodologies are widely used in all industry sectors in order to complete projects successfully. Charvat (2003) defines methodology as "set of guidelines or principles that can be tailored and applied to specific situation". As reported by CHAOS Manifesto 2013, only 39% of IT projects had been delivered on time, on budget and with required features and functions in 2012. For this reason, organizations and project managers need to utilize proper project management methodologies in order to increase success chance and complete projects on time within specified constraints and with desired features.

(Charvat 2003; Pitagorsky 2003; Turbit 2005; Wideman 2006), (as cited in Chin and Spowage, 2010 and 2012) classify methodologies into two different categories: Project management methodologies and application development methodologies. In their own study, Chin and Spowage (2010) classify methodologies into five different groups in line with the level of specificity: "Best practices, standards and guidelines; Sector specific methodology; Organization specific customized methodology; Project specific methodology and Individualized methodology". In accordance with this classification they include PMBOK, PRINCE2 and the Association for Project Managers Body of Knowledge (APMBOK) inside "Best practices, standards and guidelines" group. Best practices are independent of sector, organization and they can be applied to any project. These best practices have been created by international organizations, such as Project Management Institute (PMI) or APM, as a result of efforts "to codify the area of knowledge required for competent project management" (Meredith and Mantel, 2012).

According to Project Management Institute (PMI) there are more than 500.000 PMI certification holders in 180 different countries. Similarly, PRINCE2 is a worldwide recognized methodology, especially popular in the UK, many other European countries and in Australia. APMBOK is also based in the UK and developed

by APM. In this study we focus on two widely used best practices: PMBOK and PRINCE2.

2. Project management methodology selection

(Charvat, 2003) explains that companies should consider five objectives during the selection of a project management methodology:

1. The overall company strategy, i.e. how competitive we are as a company
2. The size of the project team and/or scope to be managed
3. The priority of the project
4. How critical the project is to the company
5. How flexible the methodology and its components are (p.66).

In addition to organization objectives, project managers is also effective during the selection of methodology. Rehman and Hussain (2007) discusses that project managers decide framework or methodology basing on the criteria such as "expert opinion, past working experience, government rules and regulations, organization/senior management/stakeholders preferences and client location". Another factor effecting methodology selection maybe the characteristics of IT projects. According to both literature study and interviews in a large organization, (Sharon, 2009) (as cited in Sharon, Soares, Barjis , Berg and Vrancken, 2010) identifies characteristics of the software projects as follows: "requirements maturity, development stability, project size, risk clearness, outsourcing, scope clearness, client's commitment, team relationship, team size, method of contracting, stakeholders flexibility".

We believe that characteristics of the methodologies themselves are also critical for the selection of the most suitable methodology for companies and project managers. To achieve decision criteria for organizations, we need to identify distinguishing characteristics of PMBOK and PRINCE2 and also find out approaches of methodologies to IT project characteristics.

3. PMBOK and PRINCE 2 comparison

PMBOK and PRINCE2 were compared in several studies from different perspectives. (Siegelau, 2004) identifies strengths of PRINCE2 in order to explain how PRINCE2 complement PMBOK. Rehman and Hussain (2007) compares PMBOK with five different methodologies/frameworks including PRINCE2 at high level and suggests a generic project management model. Chin and Spowage (2012) compares various methodologies across different countries and different sectors according to defined features. Ghosh, Forrest, Dinetta, Wolfe and Lambert (2012) compares PMBOK with five different standards including PRINCE2; they identify high level differences and synergies between two methodologies, gaps in PRINCE2 covered by PMBOK and lastly how PRINCE2 can enhance PMBOK in terms of principles, themes, processes and activities. Singh and Lano, (2014) compares methodologies at high level, as well as knowledge areas vs. themes and processes. Waheed (2014) compares PMBOK, PRINCE2 and CMMI at high level. In this study we begin with comparing methodologies at high level, by reviewing above studies and also PRINCE2 and PMBOK. Then, we continue comparison with themes vs. knowledge areas and processes from both perspectives, by reviewing PRINCE2 and PMBOK in detail.

PMBOK is developed by PMI and it "defines project management related concepts, contains globally recognized standard and guide for project management profession" (PMBOK, p.1). On the other side, PRINCE2 is developed by the UK Office of Government Commerce (OGC). It is a "structured project management method based on experience drawn from thousands of projects" (PRINCE2, p.3). The general high level comparison can be seen below at Table-1:

Table 1: The High Level Comparison between PRINCE2 and PMBOK

Feature	PRINCE2	PMBOK
Definition	Structured PM methodology (PRINCE2, p.3)	Standard and guide (PMBOK,p.1)
Practical vs. Comprehensive	Practical, focuses on critical areas (Siegelaub, 2004; Singh and Lano, 2014)	Comprehensive (Siegelaub, 2004; Singh and Lano,2014)
Themes And Knowledge Areas	7 Themes	10 Knowledge Areas
Processes And Activities	7 Process and 35 Activities	5 Process group and 47 processes
Principles	7 Principles	-
Techniques	Only PRINCE2 specific techniques are explained (PRINCE2, p.7)	Covers techniques for each process
Interpersonal Skills	Not covered (PRINCE2, p.7)	Covered (PMBOK p.513; Ghosh, Forrest, Dinetta, Wolfe and Lambert, 2012)
Focus	Business Case and Product (PRINCE2, P.11; Singh and Lano, 2014; Ghosh, Forrest, Dinetta, Wolfe and Lambert, 2012)	Customer Requirements (Singh and Lano, 2014)
Role of The Project Board	Calls for a Project Board to provide oversight (Siegelaub, 2004)	Only suggests the role the sponsor should be playing (Siegelaub, 2004)
Organizational Assets And Environmental Factors	Partly covered	Strongly integrated with processes.
Management Principle	Manage by exception (PRINCE2, p.13 ;Siegelaub, 2004)	-

PRINCE2 has 7 THEMES, which are defined as "aspects of project management that must be addressed continually" (PRINCE2, p.17). On the other side, PMBOK has 10 knowledge areas which are defined as "a complete set of concepts, terms and activities that make up a professional field, project management field, or area of specialization" (PMBOK, p.60). PMBOK Coverage of PRINCE2 Themes and PRINCE2 Coverage of PMBOK Knowledge Areas can be seen below at Table-2 and Table-3:

Table 2: PMBOK Coverage of PRINCE2

PRINCE2 Themes	PMBOK Coverage	Comments
Business Case	May be periodically reviewed for multiphase projects (PMBOK,p.69)	PRINCE2 has stronger emphasis on continuous Business Case
Organization	Stakeholder Management, Human Resources management	PMBOK has stronger mechanisms
Quality	Quality management	-
Plans	Scope, time, cost management	-
Risk	Risk management	-
Change	Monitor and control process group	-
Progress		

The results shows that quality, plans, risk themes are comparable to quality management, scope/time/cost management and risk management knowledge areas respectively (Siegelaub, 2004; Singh and Lano, 2014). Additionally change and progress themes are comparable to monitor and control knowledge area of PMBOK. Although PMBOK also mentions business case, it is not covered as detailed as in PRINCE2. On the other side, PMBOK has stronger mechanisms for defining roles and responsibilities and management of human resources.

Table 3: PRINCE2 Coverage of PMBOK Knowledge Areas

PMBOK	PRINCE2	Results
Integration Management	Partly covered (Plans, change, progress)	PMBOK has a complete integration mechanism
Scope Management	Plans	-
Time Management		-
Cost Management		-
Quality Management	Quality, Configuration Management	-
Human Resource Management	Partly covered by Organization Theme	PMBOK is stronger
Communications Management	Partly covered	PMBOK has more detailed concept
Project Risk Management	Risk	-
Procurement Management	Not covered	Only covered by PMBOK
Stakeholder Management	Partly covered (Organization)	PMBOK is stronger

The results show that, scope/time/cost, quality, and risk management knowledge areas are comparable to plans, quality (and also configuration management) and risk themes; human resource management is partly covered by organization theme and procurement management is not covered by PRINCE2 (Siegelaub, 2004; Singh and Lano, 2014). Additionally, stakeholder management is stronger at PMBOK because it is partly covered by PRINCE2 inside organization theme. Moreover integration knowledge area cannot be covered completely by PRINCE2, because PMBOK has a complete mechanism. PRINCE2 has 7 processes, which are defined as "structured set of activities designed to accomplish a specific objective", and 35 activities, which are "a set of recommended actions designed to achieve a particular result" (PRINCE2,

p.113, 115). On the contrary, PMBOK has 5 process groups and 47 processes, which are defined as "a set of interrelated actions and activities performed to create a pre-specified product, service or result" (PMBOK, p.47). PMBOK Coverage of PRINCE2 Processes and Activities and PRINCE Coverage of PMBOK processes can be seen below at Table-4.

Table 4: Comparison of Processes

PRINCE2 Processes	PMBOK Coverage	PMBOK Processes	PRINCE2 Coverage
Starting Up Project	Partly covered by Initiating process group + Human Resource Management Knowledge Area	Initiating	Starting up Project
Directing a Project	-	Planning	Initiating a Project+ Starting up Project (partly)
Initiating a Project	Planning + Initiating (Partly)	Executing	Controlling a Stage + Managing Product Delivery (partly)
Controlling a Stage	Executing + Monitoring and Controlling	Monitoring and Controlling	Controlling a Stage and Directing a Project (monitor and control activities)
Managing product delivery	Partly covered by Executing	Closing	Managing a stage boundary
Managing a stage boundary	Closing process group	-	Closing a project
Closing a project		-	-

The results show mapping of processes of methodologies (Singh and Lano, 2014). It can be seen from the table that both methodologies has some superiority over the other one in terms of scope and details of activities. The differences between methodologies in agreement with table are:

1. PRINCE2 has comprehensive activities for starting up a project.
2. Direction of project by project board is only covered by PRINCE2.
3. Managing Product delivery from perspective of Project Team is covered clearly by PRINCE2.

4. IT project characteristics and project management frameworks

In agreement with the software projects characteristics identified by Sharon (2009), PRINCE2 and PMBOK comparison can be seen below table:

Table 5: IT Project characteristics and management frameworks

Characteristic	PRINCE2 and PMBOK Comparison
Requirements Maturity	Comparable
Development Stability	Comparable
Project Size	Although both practices are tailorable, PRINCE2 is a methodology and it has more practical approach for small size projects.
Risk Clearness	Comparable

Scope Clearness	Comparable
Client's Commitment	PMBOK is customer requirements focused, so provides better mechanism for projects with high client commitment.
Team Relationship	PMBOK has stronger communication management mechanism, and it also covers interpersonal skills which is essential for creating the environment for effective communication. For large size and new created teams it can be useful to apply PMBOK approach.
Team Size	
Method of Contracting	Independent of the contract method, PMBOK has procurement management knowledge area and explained techniques for effectively managing contracts, and procurement processes are integrated inside process groups. For this reason, it is useful to apply management knowledge area of PMBOK for the projects that requires high level of outsourcing and comprehensive contracts.
Outsourcing	
Stakeholders Flexibility	Flexible stakeholders may influence the project from many perspectives, for both frameworks. On the other side, it is useful to apply stakeholder management area and stakeholder engagement techniques of PMBOK for the projects that has high level of stakeholder engagement.

5. Conclusion

Based on comparison of PMBOK vs. PRINCE2 above, we identify main differences, superiorities and also the similarities of the methodologies. As seen in Table-6, although PMBOK provides more comprehensive approach with detailed techniques, PRINCE2 has also some features that are not covered by PMBOK, such as integration of project board activities and management by exception approach.

Table 6: PRINCE2 and PMBOK Main Differences

Features	PRINCE2	PMBOK
Practical Approach	✓	-
Comprehensive Approach	-	✓
Project Board Activities	✓	-
Management by Exception	✓	-
Procurement Management	-	✓
Product Focus	✓	-
Customer Requirements Focus	-	✓
Detailed Techniques	-	✓
Interpersonal Skills	-	✓

The features in Table-7 are covered by both methodologies in different level of detail and in different perspective. For this reason, it can also be important for the selection of the methodology. For example, continued business justification is one of the most important principles of PRINCE2 and it is also covered as a Theme named "Continuous Business Justification" with strong emphasis. On the contrary, it is also mentioned by PMBOK that business case is reviewed periodically, but not as strong as PRINCE2. Similarly PMBOK has well defined integration knowledge area and also more comprehensive monitor and control process group.

Table 7: PRINCE2 and PMBOK Comparison

Features	PRINCE2	PMBOK
Integration of Processes	✓	✓✓
Continuous Business Justification	✓✓	✓
Organizational Process Assets and Environmental Factors Integration	✓	✓✓
Start Up Project Activities	✓✓	✓
Human Resource Management	✓	✓✓
Communications Management	✓	✓✓
Stakeholder Management	✓	✓✓
Configuration Management	✓✓	✓
Managing Product Delivery (From Project Team perspective)	✓✓	✓

Finally, the similar characteristics can be seen below table. Both practices have comparable approach to features such as tailoring and closing the project.

Table 8: PRINCE2 and PMBOK similar features

Features	PRINCE2	PMBOK
Tailoring	✓	✓
Closing	✓	✓
Quality management	✓	✓
Risk management	✓	✓
Cost Management	✓	✓
Scope Management	✓	✓

When we compare the results with the literature study mentioned in previous sections, we find out below additional differences:

1. PMBOK has stronger mechanism for integration of processes.
2. Organizational Process Assets and Environmental Factors are better integrated with processes at PMBOK.
3. PMBOK has stronger communications management mechanism.
4. PRINCE2 covers managing product delivery activities from the perspective of the project team.

In accordance with above comparison, we also identify that PRINCE2 is preferable for small size IT projects; whereas PMBOK is preferable (or needs to be utilized) for the IT projects with high client commitment, large and complex project teams, high level of outsourcing, comprehensive contracts and high level of stakeholder engagement. As it can be seen from comparison results, it is clear that both practices have some advantages and disadvantages depending on the organization and the project itself. Organization needs to choose the one that fits best to them. Another approach may be choosing the one that fits best to organization and utilizing the other methodology as a supportive one. A selected methodology may not cover all requirements of the organization, project manager and the project.

Moreover, we believe that in addition to project management methodology and IT project characteristics,

national standards and bureaucracy related with project management, characteristics of the organization itself and sector specific critical success factors (such as defense sector) also effect the decision for project management methodology selection. When we consider all these factors, a new methodology that covers all requirements maybe the best choice.

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