PM World *Journal*
Vol. VII, Issue I – January 2018
www.pmworldjournal.net

Life Cycles, Process Groups and Knowledge Areas
by Crispin (Kik) Piney
Featured Paper

PMI's Models of Project Management Knowledge – Life Cycles, Process Groups and Knowledge Areas

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1. Foreword

I started to think about these points in 2010, when all of the PMI® standards used a process-based approach. Over the years, I exchanged a few emails with Max Wideman who provided useful comments and encouraged me to complete the analysis. On reading the Sixth Edition of the *PMBOK® Guide*, I have found that my ideas are still valid. So, I have done my best to follow his advice.
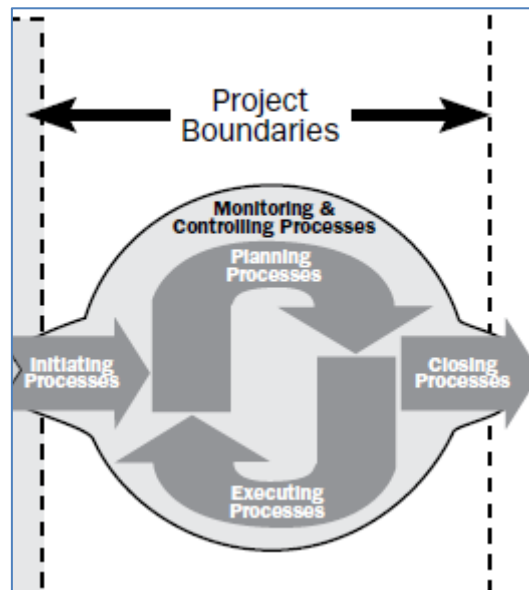
2. Abstract

The *Standard for Project Management* and the *Guide to the Project Management Body of Knowledge (PMBOK® Guide)* [PMI, 2017] present knowledge using three overlapping models, as follows: life cycles, processes clustered into process groups, and knowledge areas. Analysis of these models shows that, although life cycles are a stand-alone concept, the other two models should be presented in a hierarchical manner, with knowledge areas as the highest level, subdivided with respect to the generic set of process groups, and these process groups containing the processes specific to the corresponding knowledge area. It should be noted that this structure is not how the concepts were first developed for the early editions of the *PMBOK® Guide*; however, the original structure was well-meant but incorrect. This note proposes a reworking of those initial ideas, to provide a consistent model that avoids the current – and damaging – confusion between process groups and life cycle phases.

3. Introduction

PMI® uses a three-dimensional model for structuring the knowledge required in order to apply best practice in project management. This model comprises processes, process groups (PGs), and knowledge areas (KAs). This three-dimensional view can be confusing even to practitioners in the field. Experience shows that this is definitely the case for life cycles and process groups (this is even the case with books and training courses aimed specifically at PMI's PMP® certification). The "Devil's Dictionary of Project Management Terms" [PM World Journal, 2017] provides a concise view of this confusion, as follows: "Process Groups - Formal assemblages of processes based on characteristics of use to the assemblers rather than to the users of the concept. Its greatest benefit is as a basis for identifying people who do not understand project management, as they think that the process groups equate to project life cycle phases".

Many organizations attempt to base themselves on PMI's *PMBOK® Guide* – and do it wrongly. Much of the responsibility for this confusion lies with the way in which the *PMBOK® Guide* addresses the concept of PGs. For example, Figure 2-1 in The *Standard for Project Management* increases this confusion around the role of PGs (see Figure 1). In this diagram, the PGs (Initiating, Planning, Executing, Closing as well as Monitoring and Controlling) are presented as a cohesive sequence spanning the entire project space; that, of course, is exactly the role of a life cycle.

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Figure 1: Despite its Appearance, *This is Not a Life Cycle*

Many books and courses describing PMI's standards also talk about PGs as if they were life cycle phases. The authors of the *PMBOK® Guide* recognize this, and, in a number of places, state explicitly that "process groups are not phases". However, by defining PGs in this way by what they are not may be an entertaining surrealist approach to the world (see "Ceci n'est pas une pomme" by René Magritte in Figure 2) but cannot be relied upon to reduce confusion in a technical area.
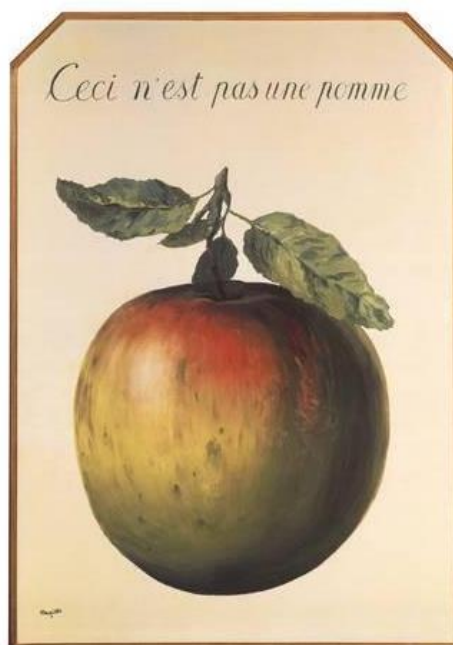
Figure 2: René Magritte's painting "This is Not an Apple"

However, phases and PGs are valuable concepts if used correctly, and this confusion is damaging to the profession.

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This article is designed to clear away the confusion and provide a basis for better understanding by proposing changes to the way the *PMBOK*® *Guide* and The *Standard for Project Management* address these concepts.

The first step in determining how to achieve this is to understand the current approach used in the *PMBOK® Guide*.

4. The Three Models

PMI presents three ways of structuring the field of project management. These are:

1. Life cycles (section 1.2 of the *PMBOK® Guide*)
2. Processes arranged in five process groups (section 1.2)
3. Knowledge areas (sections 4-13).

4.1 Life Cycles

A project life cycle is a set of sequential, interdependent phases leading from the start to the end of the project. It may be helpful to think of the life cycle of a butterfly (egg, caterpillar, pupa, butterfly)[1].

The role of a project life cycle is to subdivide the chronological development of the project into distinct parts (called "phases") in order to ensure effective management and technical control by limiting the amount of future investment and work authorized at any point in time. In some circumstances, phases are subdivided into smaller elements, often called stages, as shown in Figure 3 below. The phases are: Pre-design, Design, Pre-construction, Construction; "construction" has many (product-related) stages that are not shown. A diagram of this type also helps in identifying missing phases or stages. It is clear from Figure 3 that the "Handover" phase has been overlooked!
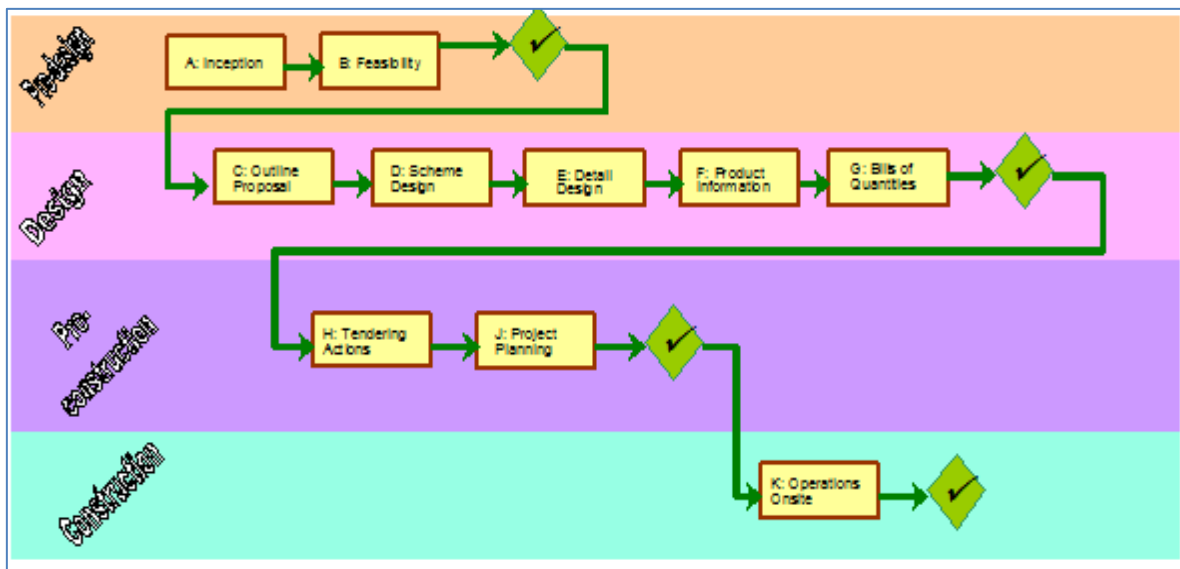

Figure 3: Phases and Main Stages of a Building Project, with Go/Nogo Reviews at the End of Each Phase

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[1] As a terminological aside: "life cycle" refers to this development chain, "lifetime" refers to the period of time between the start and end of an item (we won't reach the stars in my lifetime) and "lifespan" measures the elapsed time from the start to the end of an event (e.g. the average human lifespan is still increasing in many countries).

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It is interesting to note that the PRINCE2 standard by OGC [OGC 2009] explicitly states that one defining characteristic of a project is that it has a life cycle: in other words, if it does not have a life cycle, it is not a project.

4.2 Processes

A process in its most general form is a mechanism for transforming an input or set of inputs into an output or set of outputs by the application of a set of tools and techniques (e.g. the "drill a hole" process starts with a piece of wood [the Input], uses a drill [the Tool] and delivers: a piece of wood with a hole, plus sawdust [the Outputs]).

The whole subset of the project management body of knowledge addressed by PMI is translated into a number of processes (49 in all). A process can only belong to a single PG and a single KA.

4.3 Process Groups

In the PMI standards, the processes are grouped into five PGs under the mnemonic IPECC:

1. Initiating
2. Planning
3. Executing
4. Controlling
5. Closing

The potential for confusion arises because (apart from "controlling"), the names of the groups could also apply to life cycle phases. The confusion is compounded by the fact that PMI presents the concept of processes and PGs before describing KAs. This issue is explained in more detail later on in this article.

Note however, that processes from the various PGs can be invoked in many phases. and IPECC repeats within each one of the phases. To be more precise, there are multiple, simultaneous, asynchronous IPECC cycles running within each phase (e.g., you may be identifying new risks, while executing a part of communication plan, while closing a procurement, etc.)

4.4 Knowledge Areas

A knowledge area is a subdivision of the body of knowledge that corresponds to a specific set of technical or managerial activities that require a specific set of skills and experience.

There are ten knowledge areas defined in the *PMBOK® Guide* – such as Time Management, Risk Management, etc. The relationship between KAs and PGs is key to understanding the true role of PGs.

Knowledge Areas and Process Groups

It is at this point that the full value of processes can be seen: for example, in order to be able to manage time effectively in a project, you need to describe the actions clearly, and the process approach has obvious benefits for this. The PGs provide a means of carrying out the analysis and definition of each knowledge area in a consistent manner[2]. The *PMBOK® Guide* describes the PGs in terms of their action within the life cycle as a whole. However, I will show that the

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[2] Apparently, in the original development of the *PMBOK® Guide*, the initial decomposition of the body of knowledge was in terms of processes. The concepts of "process groups" and of "knowledge areas" were developed in order to cluster together processes with similar characteristics.

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concept of PGs is much more powerful *if it is applied within each KA separately*. In any knowledge area, you may need to:

- do some initial setting-up and define the scope and parameters specific to the corresponding project ("initiating")
- plan the activities in order to achieve the knowledge-area-related result ("planning")
  - these activities will be integrated into a consolidated action plan (this is the link that all of the KAs have to the Integration KA)
- Carry out the actions relevant to the KA ("execution")
- Determine the effectiveness and alignment to the plan ("monitoring")
- Propose additional actions, if any, based on the results of the current status ("control")
- Carry out any knowledge-area-specific actions to terminate some or all of the activities in the KA ("closing")

Since, as explained below, processes aim to provide capabilities required by the corresponding KAs, it is more logical to group them into consistent categories (i.e., PGs) *within* KAs, rather than defocussing the role of PGs across the entire life cycle.

Knowledge Areas and Processes

The processes for each knowledge area are invoked whenever the need arises – for example, for Risk Management:

- Plan Risk Management (which is really an initiation process, but that PMI has put into "planning") is required in order to determine the overall approach applicable to the rest of the processes (it is known as "Establish [Risk Management] Context" in ISO 31000 [ISO, 2009]). This process needs to be carried out early in the life cycle so that its results can be integrated into the project management plan, but also needs to be reiterated whenever the context is better understood or changes.
- Identify Risks, Analyse Risks (with two categories of analysis), and Plan Risk Responses belong in the "planning" group (Identification is a prerequisite to the Analysis, but is not obviously part of Planning – but there is no "Analysis" PG to place it in).
- Plan Risk Responses is a part of the "planning" group and
- Monitor and Control Risks belongs in the "monitoring and controlling" group – although it would be preferable to separate monitoring from controlling –
  - Monitoring includes
    - Checking the "watch list" of accepted risks
    - Tracking symptoms and warning signs of risks for which responses are required
    - Identifying triggers for contingency actions
    - Verifying the effectiveness of implemented responses
    - Watching out for emergent risks
  - Control implies
    - Executing actions agreed in the approved plan based on validated trigger conditions
    - Proposing additional actions to address the current situation
    - Requesting risk reassessment (full risk management cycle) under specific conditions such as phase transition, occurrence of major events, etc.

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- The PMI standards do not propose any explicit "closing" process for risk management[3] although there are a number of closing actions to be carried out. For example:
  - When a risk can no longer occur: to exclude it from the active list
  - When the project terminates, transfer the information
    - Update risk-related lessons learned
    - Transfer any future, operational uncertainties to the receiving organization
    - Close outstanding project risks and archive the risk register.

A process in one knowledge area can invoke, and provide inputs for, one of processes in the same or in other knowledge areas; its execution may require the use of outputs from other processes in the same or in another knowledge area. Whereas PGs tend to indicate the logical sequence of process activities within a given KA, they are no guide to the order in which processes are invoked between KAs. This feature confirms the earlier assertion that _PGs are only really applicable within KAs_.

Process Groups Within Knowledge Areas

As explained above, PMI's standards present each of the three *PMBOK®* models in the order: life cycles, process groups, and then knowledge areas. This approach can give the impression on reaching Chapter 4 that KAs are arbitrary clusters of the processes. This is of course not the case at all, and processes provide the driving force for delivering part of the corresponding KA. In this way, the PGs provide a structured way of analysing one KA at a time, identifying the best practices relative to that area, and describing the processes involved in delivering these best practices (e.g. "for resource management: what planning activities are required to ensure effective management of resources in most projects most of the time?").

KAs are knowledge-based clusters of processes whereas PGs focus on function. Seen another way, each KA is a process in its own right, made up of component (sub-) processes. This view provides a progressive way of developing the content of each KA in a manner compatible with the overall approach of the *PMBOK® Guide*: i.e. progressive elaboration and hierarchical decomposition.

This analysis is best carried out by focussing, within the KA, on each of the PGs in turn, as explained above where the Project Risk Management KA was used as an example

In this way, the PGs should be used as an aid to analysis and understanding *within* each KA. They provide a logical sequencing of steps *within* each KA, and, in accordance with the progressive elaboration approach for projects, some or all of this sequence is normally reiterated a number of times during the lifetime of a project.

The crucial, additional point to understand is that although this looping happens in all KAs, the loops are normally asynchronous between KAs although there can be some interactions. For example, when a phase terminates ["closing" in Integration Management] it is good practice to assess the situation with respect to risk ["planning" in Risk Management].

Table 1-4 in the *PMBOK® Guide* gives the full set of processes in terms of both their corresponding PG and their KA.

Table 1-4 can be shown in the hierarchy: Knowledge Area, Process Group, Process as shown below:

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[3] There is, in fact, only a one process in the "closing" PG in the PMBOK® Guide.

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4: Project Integration Management

Initiating
 4.1 Develop Project Charter
Planning
 4.2: Develop Project Management Plam
Executing
 4.3 Direct and Manage Project Work
 4.4: Manage Project Knowledge
Controlling
 4.5: Monitor and Control Project Work
 4.6: Perform Integrated Change Control
Closing
 4.7: Close Project or Phase

5: Project Scope Management

Planning
 5.1: Plan Scope Management
 5.2: Collect Requirements
 5.3: Define Scope
 5.4: Create WBS
Controlling
 5.5: Validate Scope
 5.6: Control Scope

6: Project Schedule Management

Planning
 6.1: Plan Schedule Management
 6.2: Define Activities
 6.3: Sequence Activities
 6.4: Estimate Activity Durations
 6.5: Develop Schedule
Controlling
 6.6: Control Schedule

7: Project Cost Management

Planning
 7.1: Plan Cost Management
 7.2: Estimate Costs
 7.3: Determine Budget
Controlling
 7.4: Control Costs

8: Project Quality Management

Planning
 8.1: Plan Quality Management
Executing
 8.2: Manage Quality
Controlling
 Control Quality

9: Project Resource Management

Planning
 9.1: Plan Resource Management
 9.2: Estimate Activity Resources
Executing
 9.3: Acquire Resources
 9.4: Develop Team
 9.5: Manage Team
Controlling
 9.6: Control Resources

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10: Project Communications Management
Planning
  10.1: Plan Communications Management
Executing
  10.2: Manage Communications
Controlling
  10.3: Monitor Communications

11: Project Risk Management
Planning
  11.1: Plan Risk Management
  11.2: Identify Risks
  11.3: Perform Qualitative Risk Analysis
  11.4: Perform Quantitative Risk Analysis
  11.5: Plan Risk Responses
Executing
  11.6: Implement Risk Responses
Controlling
  11.7: Monitor Risks

12: Project Procurement Management
Planning
  12.1: Plan Procurement Management
Executing
  12.2: Conduct Procurements
Controlling
  12.3: Control Procurements

13: Project Stakeholder Management
Initiating
  13.1: Identify Stakeholders
Planning
  13.2: Plan Stakeholder Engagement
Executing
  13.3: Manage Stakeholder Engagement
Controlling
  13.4: Monitor Stakeholder Engagement

Although Table 1-4 in the *PMBOK® Guide* is useful in that is shows the two groupings on a single chart, it fails to show the important concept that the PGs are clusters within the corresponding KA, and have much less significance outside those areas: PGs indicate the type of activity you are carrying out, but KAs ensure that it is applied to deliver practical results for the project.

Understanding the Confusion

The confusion between process groups and life cycle phases extends into a number of third-party training documents – which I have chosen not to cite in the bibliography. As an example, the terminology sometimes used of a project "being in the execution process group" is meaningless since, at any time, its active processes may be taken from more than just a single PG, and the project is actually "within" many PGs most of the time. The confusion is exacerbated by the use of similar terms for PGs (e.g. "Planning") and the life cycle phases commonly used.

To explain why this multi-use of similar terms is a source of confusion, consider the following illustrative example:

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You have a number of potential diseases (say 10, like Knowledge Areas), each with its own set of pills (49 or so, in all, like PMI's processes). There are, as we all know, 7 days in the week, called Monday, Tuesday, etc. (our life cycle).

Now, you find that for organizational reasons, the Para-Medical Institute (PMI) has supplied you with the pills boxed together by similar characteristics, into 7 boxes called Monday, Tuesday, etc. (based on the traditional children's rhyme: for example, "Monday's child is fair of face" for the dermatological pills, "Thursday's child has far to go" for the laxatives, etc.). They have included an instruction sheet that states clearly "the names on the boxes **do not correspond to** the days on which you should take the pills"[4].

For any given disease, or set of diseases, you will have to take pills from one or more of the boxes (labelled Monday, Tuesday, etc.) on one or more days of the week, depending on the disease and your constitution. The days on which you have to take the pills are unlikely to be the same as the days printed on the boxes.

I, for one, would consider this to be a less than optimal way of ensuring compliance with the prescribed treatment regimen for a specific disease – as you would be tempted to confuse the pill boxes with a set of chronological instructions!

This analysis underlines the need for modifying the approach currently used for defining and explaining process groups.

Proposed Changes to the *PMBOK® Guide* – Sixth Edition

Textual Changes

All of the text needs to be reviewed for references to PGs and adapted to make the relationships clear. For example:

❖ "Project management is accomplished through the appropriate application and integration of logically grouped project management processes. While there are different ways of grouping processes, the PMBOK® Guide groups processes into five categories called Process Groups."

Change to

❖ "Project management is accomplished through the appropriate application and integration of logically grouped project management processes. While there are different ways of grouping processes, the *PMBOK® Guide* groups processes into five categories called Process Groups. *These Process Groups are applied within each of the ten areas of expertise known as Knowledge Areas.*"

Option 1: Reworking the Process Group Definitions

Removing the Confusion

The first option would be to change the PG definitions in order to avoid phase-related terminology.

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[4] This statement was inspired by the one in the *PMBOK® Guide* that states "process groups **are not** project phases"

- **Initiating Process Group**. Those processes that determine the environment, agree the objectives, set the rules and authority under which work should be carried out, and obtain the corresponding approval for that work.

- **Planning Process Group**. Those processes required to establish the scope, refine the objectives, and define the course of action required to attain the objectives that the project was undertaken to achieve.

- **Executing Process Group**. Those processes performed to deliver the work defined in the corresponding management plans, and report on status.

- **Monitoring and Controlling Process Group**. Those processes required to track, review, and regulate the progress and performance of the project; identify any areas in which changes to the plan are required, assess the corresponding changes, and update the project plans as required.

- **Closing Process Group**. Those processes performed to finalize all activities relative to a given knowledge area.

Effect on the Composition of the Process Groups

The removal of the phase-related terms in the definitions of the Initiating and Closing groups makes it clear that life cycle management concepts need to be catered for elsewhere. This need can best be satisfied by adding the following Controlling process to the Project Integration Management KA: *Manage Phase Transitions*; this process can be defined in such a way as to allow the removal of the *Close Project or Phase* process or at least its replacement by a specific *Close Project* process.

Given the modified definition of the Initiating PG, the following change should also be made:

- Transfer "Plan Risk Management" from the Planning PG to the Initiating one. This is because the resulting Risk Management Plan describes the rules and conventions in general for managing risk in the project; it does address the specific risks in the project.

This initial redefinition of the PGs would certainly make a number of points clearer and more coherent, but does not go far enough in removing the potential confusion with life cycle phases due to the current naming and implied scope of the PGs.

Option 2: A New Concept for Process Groups

Initial Thought on Adding a Process Group

Table 1-4 in the *PMBOK® Guide* shows that the "planning" group incorporates processes the are precursors to the planning, in that they provide an analysis of the specific situation with respect to the objectives of the KA.

The results of an additional PG, the Analysis PG, are therefore required before the planning can be carried out.

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The new definition of an **Analysis Process Group** would allow it to capture a number of processes currently rather uncomfortably in the Planning group: Collect Requirements, Identify Risks, Perform Qualitative Risk Analysis, and Perform Quantitative Risk Analysis.

This idea may improve the use of process grouping to some extent, but it does not solve the basic problem of confusion caused by on the naming of the PGs.
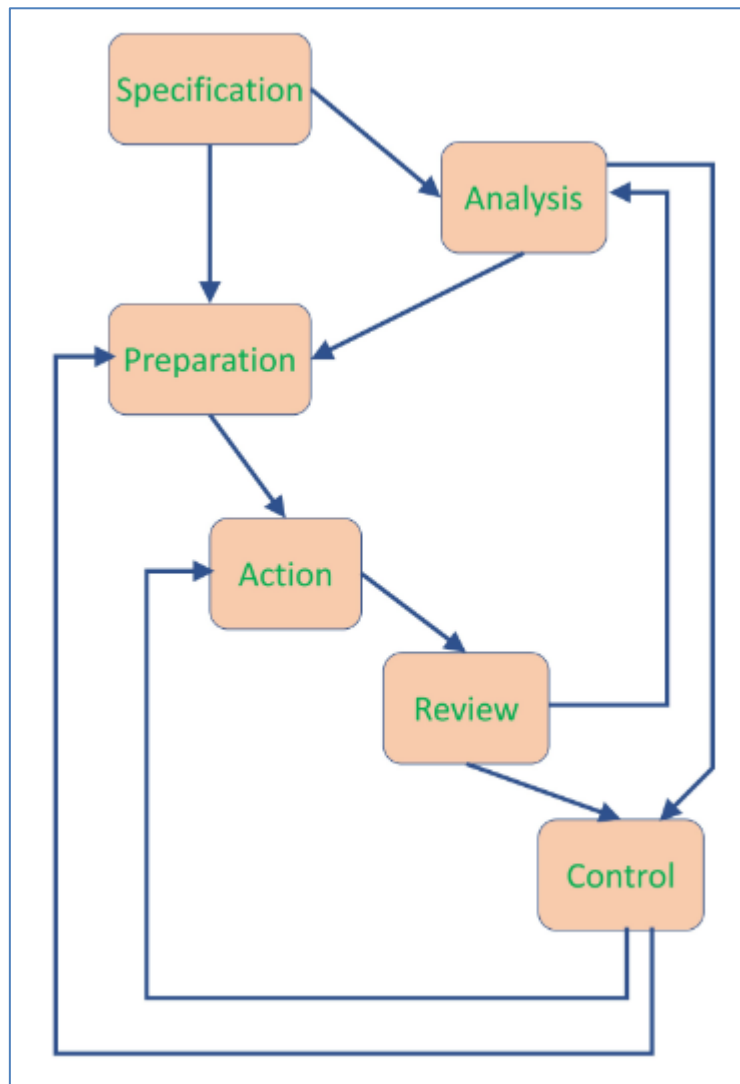
Changing the Process Grouping Framework

As a more radical, but much better alternative to reworking the current set of PGs, and to provide a clear break with the past, a set of "knowledge area steps" (KASes) should be defined to replace the PGs. In contrast with PGs which seem to be closely related to the entire project life cycle, KASes are designed to be meaningful only within the corresponding KA. A KAS is defined as **a category of activities carried out for a specific purpose *within a knowledge area*.** The KASes are normally carried out sequentially within a KA, and can be reiterated as required. Not all KASes are necessarily represented by processes in each KA.

The IPECC model of PGs should then be replaced by the SPAARC KASes defined below This change to the set of names serves additionally as a reminder of the change of concept: each of these SPAARC categories is *applicable only within a KA*. The six KASes are as follows:

1. *Specification*. The specification processes set the rules and authority under which the KA work should be carried out, and determine the environment for the work. This KAS would mainly incorporate processes from the Initiating and Analysis PGs. These processes would normally be followed by ones from the Analysis or the Preparation KAS.

2. *Analysis.* The analysis processes are performed to transform raw data into action-oriented information. These processes would normally be followed by ones from the Preparation or the Control KAS.

3. *Preparation*. The preparation processes are those required to define the course of action required to attain the objectives to which the KA should contribute. These processes would normally be followed by ones from the Action KAS.

4. *Action*. The action processes are performed to deliver the work defined in the corresponding management plan for the KA. These processes would normally be followed by ones from the Review KAS.

5. *Review*. The review processes are required to track, review and report the progress and performance of the KA work. This includes identifying any significant differences between actual and planned values. These processes would normally be followed by ones from the Analysis or the Control KAS.

6. *Control*. The control processes are performed to regulate the progress and performance of the KA work, determine any changes to the plan required to address performance issues highlighted from reviewing, and assess the viability of corresponding changes. It should be noted that life cycle governance processes such as managing phase transitions, as well as initiation, and closing a project belong in the Control KAS. The processes would normally be followed by ones from the Preparation or the Action KAS.

These interactions are shown in Figure 4.

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Figure 4: The Set of Potential SPAARC Interactions Within any Knowledge Area

Table 1-4 from the *PMBOK® Guide* should be restructured based these definitions. The hierarchical representation of this restructuring, from KAs, to KASes, to processes, is shown below in Table 1 in a similar form to Table 1-4 from the *PMBOK® Guide*. This restructuring also provides a more balanced grouping of processes than the IPECC convention, as can be seen by the number of processes in each KAS shown in the headings in Table 1.

The analysis required for this restructuring raises a number of questions on the set of processes for some of the KAs: for example, 12.1 "Plan Procurements" should probably be subdivided into two processes – one for the make-or-buy decisions (Specification), the other to develop the procurement documents (Preparation).

As an aside, the Stakeholder Management KA that has been added for the sixth edition of the *PMBOK® Guide* would be more complete if the team-management processes 9.4 and 9.5 were transferred from the Resource Management area across to Stakeholder Management. Effective teamwork cannot be achieved if the team members are managed in the same way as inanimate resources.

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PG KA	Specification (10)	Preparation (4)	Analysis (13)	Action (8)	Review (5)	Control (9)
Integration Management	4.1: Develop Project Charter	4.2: Develop Project Management Plan	4.4: Manage Project Knowledge	4.3: Direct and Manage Project Work		4.5: Perform Integrated Change Control 4.6: Close Project or Phase
Scope Management	5.1: Plan Scope Management		5.2: Collect Requirements 5.3: Define Scope 5.4: Create WBS		5.5: Validate Scope	5.5: Control Scope
Schedule Management	6.1: Plan Schedule Management	6.5: Develop Schedule	6.2: Define Activities 6.3: Sequence Activities 6.4: Estimate Activity Durations			6.6: Control Schedule
Cost Management	7.1: Plan Cost Management		7.2: Estimate Costs 7.3: Determine Budget			7.4: Control Costs
Quality Management	8.1: Plan Quality Management			8.2: Manage Quality		8.3: Control Quality
Resource Management	9.1: Plan Resource Management	9.2: Estimate Activity Resources		9.3: Acquire Resources 9.4: Develop Team		9.5: Manage Project Team
Communications Management	10.1: Plan Communications Management			10.2: Manage Communications	10.3: Monitor Communications	
Risk Management	11.1: Plan Risk Management	11.5: Plan Risk Responses	11.2: Identify Risks 11.4: Perform Quantitative Risk Analysis 11.3: Perform Qualitative Risk Analysis	11.6: Implement Risk Responses	11.7: Monitor Risks	
Procurement Management	12.1: Plan Procurement Management			12.2: Conduct Procurements		12.3: Control Procurements
Stakeholder Management	13.2: Plan Stakeholder Engagement		13.1: Identify Stakeholders	13.3: Manage Stakeholder Engagement	13.4: Monitor Stakeholder Engagement	

Table 1: SPAARC Process Groupings in terms KAs and KASes

The SPAARC model provides a framework for analyzing the structure of each KA as well as for understanding the dependencies between processes in a KA. These points are addressed in the next two sections.

Applying SPAARC to Improve Knowledge Area Definition

Table 1 can serve as a basis for reviewing the structure of existing KAs. For example, Communications Management seems either to have bundled together Specification, Analysis, and Planning into a single process called "Plan Communications Management", or not to have any processes for analysis or for action planning. In either case, the resulting KA is incompletely structured.

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In a similar way, the SPAARC approach also provides a basis for designing any new KAs (such as "organizational change management" for example). It also helps to understand the way in which processes are used within the KAs and removes the need for the additional discussion about this that has been added into in the sixth edition of the *PMBOK® Guide*.

No Need for the Discussion on Frequency of Use

One additional benefit of the SPAARC approach is that the interdependency chart shown in Figure 4 makes the discussion, in section 1.2.4.4 of the *PMBOK® Guide*, on categories of processes, based on their frequency of use, unnecessary because:

- "Processes used once or at predefined points in the project" align with the Specifying step.
- "Processes that are performed periodically as needed" belong in the Analysis, Preparation and Action steps.
- "Processes that are performed continuously throughout the project" are those involved in Review and Control.

For that reason, this superficial analysis of process frequency of use can – and should – be removed from future editions of the *PMBOK® Guide* because their frequency of use is determined by the KAS to which they belong, and the interdependencies between KASes shown in Figure 4.

Conclusion

These changes and clarifications are designed to provide a consistent, logical model, avoiding the current confusion around the role of process groups. The model is as follows:

- The project life cycle provides sequential, end-to-end control of a project.
- Knowledge Areas define the project-related competencies required within the project team.
- The structure of each KA is described as a logical progression of Knowledge Area Steps.
- The content of each KA is specified in terms of processes.
- Each process is characterized by the KAS within its KA, and is defined in terms of Outputs, Tools & Techniques, and Inputs.[5]
- Life cycles support governance; Knowledge Areas ensure competence; Knowledge Area Steps provide structure; and processes deliver project-related results.

The proposed changes to the *PMBOK® Guide* should put these concepts on a firmer basis that is also easier to understand and less open to misinterpretation.

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[5] I have chosen to mention Outputs before Inputs, since a process exists to deliver outputs, so these should be determined and defined before anything else.

PM World *Journal*
Vol. VII, Issue I – January 2018
www.pmworldjournal.net

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*PM World **Journal***
Vol. VII, Issue I – January 2018
www.pmworldjournal.net

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