Project Management Literature: Gaps and Opportunities

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Abstract

This paper provides a review of the literature on project management practices and presents a comprehensive bibliography and a classification under the PMBOK Guide framework. 130 articles on project management published in the Project Management Journal between 1997 and 2011 are analyzed and classified into nine knowledge areas and five process groups. The findings of this review clearly show that project planning is the most popular research process group and project initiation and closure are the neglected research topics.

Introduction

The technological advancements and the accelerated global change in the marketplace and have created enormous strains on existing organizational forms. Companies have realized that project management can take a leading role in facilitating and enabling the changes involved (Koskela and Howell, 2002). Project management refers to the application of knowledge, skills, tools and techniques to project activities to meet a relatively short-term objective that has been established to complete specific goals and objectives (PMI, 2008). It is accomplished through the planning, organizing, directing, and controlling of company resources (Kerzner, 2009). Today, the concept of project management has been increasingly applied in diverse industries and organizations (Kerzner, 2009; Packendorff, 1995).

Project management has become a scientific field with its own professional associations, the Project Management Institute (PMI) and the International Project Management Association (IPMA). These associations are known as promoters of the standardization of project management and certification programs for project managers (Soderlund, 2004). A Guide to the Project Management Body of Knowledge (PMBOK Guide), published by PMI, presents a set of standard terminology and guidelines for project management. The PMBOK Guide is process-based, describing project management as being accomplished through the application and integration of the project management processes of initiating, planning, executing, monitoring and controlling, and closing. Further, it assumes that all project management practices fall into

nine knowledge areas, which are project integration management, project scope management, project time management, project cost management, project quality management, project human resource management, project communications management, project risk management, and project procurement management.

Project management is considered as a research field with potentials of bringing different disciplines to focus on projects (Soderlund, 2004). Both practical and theoretical research in this field has developed rapidly in recent years. Over the past few years, a number of review articles have appeared in conference or journal publications. Some have criticized much of the research on projects and project management. Packendorff (1995) claims that, in the dominant line of research, projects are seen as tools, project management is largely considered as a general theory, and there is no sufficient empirical research. Shenhar and Dvir (1996) state that most research on project management suffer from a scanty theoretical basis and lack of concepts. Koskela and Howell (2002) argue that there is no explicit theory of project management in prior literature and that has slowed down the diffusion of project management methods in practice. Soderlund (2004) criticizes that too much effort has been dedicated to clarifying the reasons of project success and failure, and researchers should address a number of important research questions that might be at the core in order to further the knowledge about project management.

However, no literature review has presented a comprehensive image of the existed research on project management practices. To further develop this research field, it is important to know what have been done and how they have been done in project management research. PMBOK Guide has provided us with a useful summary of doctrine of project management, which includes five process groups and nine knowledge areas. This study will make an up-to-date, comprehensive and state-of-the-art review of project management research under the PMBOK knowledge framework. There are two objectives of this paper. The first is to provide a critical investigation of the present body of knowledge in project management practices. Research articles from the major project management journal will be analyzed. The second is to propose an alternative research agenda concerning currently neglected topics, theories and research methods. The rest of the paper is organized as follows. Section 2 presents our methodology and classification framework for this study. Section 3 analyzes project management research according to the classification framework. Section 4 concludes our research and suggests further research directions.

2. Methodology and Classification Framework

A literature review is conducted. To identify relevant articles for the review, we have a detailed content search in *Project Management Journal*, which is one of the most important academic journals in project management field. Through the online scholarly database -- Business Source Complete, we collect 704 articles published between 1997 and 2011. To be included in the sample, an article has to (1) study project management practices, and (2) address one or more project management processes or knowledge areas. Finally, 130 articles are identified and they are summarized in Table 1 (see Appendix A).

The PMBOK Guide recognizes 44 processes that fall into five basic process groups and nine knowledge areas. Each of the nine knowledge areas contains the processes that need to be

accomplished within its discipline in order to achieve an effective project management program. Meanwhile, each of these processes also falls into one of the five basic process groups, creating a matrix structure such that every process can be related to one knowledge area and one process group. We thus propose a conceptual classification framework adapted from the PMBOK Guide for the available literature on research of project management (see Table 2). The classification framework consists of two dimensions, the first comprising the five basic project management process groups and the second comprising the nine typical project management knowledge areas.

(Table 2, Here)

Each of the 130 articles is classified according to following steps. First, one of the coauthors classifies the articles to categories based on the classification framework. Then, the classification is verified with another co-author. Finally, both co-authors approve the categories assigned to the article if the classification results are consistent, or hold a discussion between the co-authors to reach a consensus otherwise. After classification, we analyze the selected articles to draw some conclusions and identify some future research directions.

3. Analysis of Project Management Research

The distribution of the 130 articles is classified into the proposed classification framework (see Table 3). Table 3 identifies and lists the project management practices by the knowledge area categories and process groups. Some of the selected articles in the review address more than one project management processes, thus we categorize these studies to each process they address and regard them as separate studies as we do the analysis.

(Table 3, Here)

The following subsections present further analysis of the existed project management research.

3.1. Distribution of Studies by Year

Table 4 shows the distribution of studies by publication year. It can be seen from this table that research studies on project management practices are distributed evenly in each year. Comparing to the total number of articles published in each year, the amount of studies on project management practices is little. In the recent 15 years, only 18% (130/704) of the published articles are identified as research on project management practices.

(Table 4, Here)

3.2. Distribution of Articles by Research Method

Table 5 presents the distribution of the articles by the research methods which they use. We classify the selected articles into three categories according to their applied research methods: theoretical research, empirical research, and literature review. From the distribution, we can see

that most studies are empirical studies, which are % of the total. Literature review is the least applied research method (%) in the project management practice research.

(Table 5, Here)

3.3. Distribution of Studies by Project Management Knowledge Areas

The classification of the studies by project management knowledge areas is shown in Table 6.

(Table 6, Here)

Judging by the numbers of published studies (see Table 6), we can clearly see that the focus of project management practice research has most often been on the knowledge area of time management (42 or 21.2%), followed by risk management (39 or 19.7%) and integration management (31 or 15.7%). Human resource management (26 or 13.1%), communications management (20 or 10.1%), and cost management (17 or 8.6%) have gotten moderate attention. Less interest has been addressed in the knowledge areas of procurement management (13 or 6.6%), quality management (8 or 4%), and scope management (2 or 1%). It can be clear that "schedule development" is the most frequently studied project management process, accounting for 9.1% of the total (18 of the 198 studies). Other project management processes that have attracted much attention are "manage project team" (13 or 6.6%), "risk identification" (13 or 6.6%), "monitor and control project work" (12 or 6%), "develop project management plan" (11 or 5.6%), "develop project team" (11 or 5.6%), and "manage stakeholders" (11 or 5.6%). It is worth noting that there is no published study related to project management processes such as "develop preliminary project scope statement", "direct and manage project execution", "scope definition", "scope verification", and "scope control".

3.4. Distribution of Studies by Project Process Groups

(Table 7, Here)

Among the five project management process groups, planning is the most popular group, being studied in 53.5% (106 of 198) of the studies reviewed, followed by monitoring and controlling group, studied in 32.2% (64 of 198), and then the executing group, studied in 12.6% (25 of 198) of studies. Initiating group and closing group are seldom studied, with only 1 (0.5% of 198) research for initiating and 2 (1% of 198) for closing are identified. As shown in Table 7, planning in time management area is most studied, being 40 (20.2% of 198), followed by and risk management area, being 33 (16.7% of 198). In the monitoring and controlling group, most studies are addressed in integration management area (18 or 9.1%), human resource management (13 or 6.6%), and communications management (13 or 6.6%).

4. Conclusion

In this study, we conduct an extensive review of academic articles in Project Management Journal and provide a comprehensive bibliography and a classification framework for the research on project management practices. Our intention is to provide a critical investigation of the present body of knowledge in project management practices and inform academics of this area about the state-of-the-art research status. The results of our study lead to the following conclusions.

Firstly, only a small part of project management research studies project management practices. As Soderlund (2004) criticizes, much effort has been dedicated to clarifying the reasons of project success and failure. Project success is still the most popular topic in current project management research. Since project management is a practical area and project management practices are critical to practitioners, we encourage more research to be done in this field.

Secondly, more and more empirical studies have been conducted in the research on project management practices. In this review, we identify more empirical studies than theoretical studies. Packendorff (1995) calls for more empirical research in project management field. During the recent fifteen years, scholars have made effort to apply empirical research method. As project management practices are widely used in organizations and projects, it is becoming easier to collect empirical data than before. Thus, we suggest researchers conduct more empirical studies in this field.

Thirdly, during the recent 15 years, research has been conducted through all the project management knowledge areas. Of the nine knowledge areas, time management, risk management and integration management has attracted the greatest attention from researchers. Meanwhile, there are few studies on scope management, quality management and procurement management knowledge areas. As each knowledge area is important to project success, it is worth studying issues in all the knowledge areas, especially in areas that have been little studied. We encourage more research in scope management and quality management areas, which are very critical to project management practitioners.

Fourthly, studies are found on all the project management process groups. Not surprisingly, of the five process groups, initiating group and closing group are little studied as these processes are often neglected by project management practitioners. Planning is the most popular group, while monitoring and controlling group also gains much attention. Comparing to the planning group and controlling group, executing has not gained enough attention from researchers. We thus encourage more effort to be dedicated to the executing processes.

Overall, "schedule development" process in time management is the most studied project management process. It is obvious that scheduling is a subject of major concern for both academics and practitioners. "Manage project team", "risk identification", "monitor and control project work", "develop project management plan", "develop project team", and "manage stakeholders" processes are also popular research topics. However, other processes such as "develop preliminary project scope statement", "direct and manage project execution", "scope definition", "scope verification", and "scope control" have not been studied. Further research can be extended to all these project management processes.

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Appendix

Table 1: Studies on Project Management Practices

Authors	Jour	Method	Summary	PM Process		PM	I K	nov	vle	dge	A	reas	5	F	PM	Pro	oce	5S
	nal														G	rou	ps	
					K	K	K	K	Κ	K	K	K	K	Р	Р	Р	Р	Р
					1	2	3	4	5	6	7	8	9	1	2	3	4	5
Abbasi (2001)	PMJ	Theoreti	To schedule project activities based on	Activity definition														
	32(2)	cal	maximum net present value (NPV) and	Activity sequencing														
			minimum duration.	Activity resource														
				estimating														
				Activity duration														
				estimating														
				Schedule														
				development														
Abdomerovic	PMJ	Empiric	Recommends how multiple data	Communications														
(2000)	31(4)	al	structures can be related to produce a	planning														
			report structure.															
Adams and	PMJ	Literatur	It presents a discussion of the	Manage project														
Anantatmula	41(4)	e review	development of self-identity and an	team														
(2010)			explanation of how an individual's															
			social and behavioral tendencies can															
			influence the formation of social															
			identity, group emotion, group mood,															
			and emotional intelligence.	~				,							,			
Al-Tabtabai	PMJ	Empiric	Explains how the developed political	Cost estimating														
(2000)	31(3)	al	risk control model can be incorporated															
			directly into a project cost estimation															
			process.				,											
Amor and	PMJ	Empiric	Demonstrates that project composite	Activity duration														
Teplitz (1998)	29(3)	al	learning curves can be approximated	estimating														
			with minimal effort to provide accurate															

			estimates of program duration and								
		D · ·	delivery dates.		1					 	1
Anbari (2003)	PMJ	Empiric	It shows the major aspects of the	Monitor and control	γ						Ν
	34(4)	al	earned value project management	project work							
			method, a powerful tool that supports								
			the management of project scope, time								
			and cost.								
Andersson	PMJ	Empiric	It investigates how to lower portfolio-	Cost control							\checkmark
and Müller	38(2)	al	level project costs in the long-term								
(2007)			through identification of strategic								
			learning projects, with expected budget								
			overruns in the short-term.								
Ash and	PMJ	Empiric	It identifies policies that reduce the	Schedule control							
Smith-Daniels	35(1)	al	detrimental effects of preemption.								
(2004)											
Atkins and	PMJ	Empiric	Evaluates the role of induction and	Manage project							
Guinevere	34(2)	al	training in team effectiveness.	team							
(2003)											
Aubry et al.	PMJ	Empiric	It presents empirical results on the	Integrated change							
(2010)	41(4)	al	nature and reasons for PMO transition.	control							
Austin (2000)	PMJ	Theoreti	Describes the Analytical Design	Develop project	\checkmark					\checkmark	
	31(2)	cal	Planning Technique (ADePT), a project	management plan							
			planning methodology that provides a								
			structured approach based on								
			information flow rather than tile								
			production of design deliverables.								
Badir et al.	PMJ	Theoreti	Proposes a conceptual framework for a	Monitor and control							
(2003)	34(3)	cal	Web-based information and project	project work							
. ,			management model.	Information							
			-	distribution							
Baki (1998)	PMJ	Theoreti	Discusses the key elements of critical	Schedule							
	29(1)	cal	path method (CPM) scheduling to	development		-					
			enable to effectively represent the	_							

					1			- ,	-	-			-	
			construction logic of a project.											
Barry and	PMJ	Empiric	Considers the upshot of integrated	Information					\checkmark				γ	1
Pascale (1999)	30(1)	al	procurement communications (IPC)	distribution										
			utilizing web technology.	Performance										
				reporting										
				Manage										
				stakeholders										
Bauch (2001)	PMJ	Theoreti	Describes the development and	Monitor and control	\checkmark								γ	
	32(2)	cal	application of a Statistical Project	project work										
			Control Tool (SPCT) for engineering											
			project managers.											
Bevilacqua et	PMJ	Empiric	It describes the application of value	Plan purchases and						1	\checkmark	 	γ	
al. (2008)	39(3)	al	stream mapping to analyze and	acquisitions										
			redesign the way of managing the	Plan contracting										
			materials procurement stage of a	Request seller										
			project.	responses										
				Select sellers										
				Contract										
				administration										
Bishop (1999)	PMJ	Theoreti	States that cross-functional teams are a	Develop project										
	30(3)	cal	good management tool for responding	team										
			to changing markets.											
Boersma et al.	PMJ	Empiric	It argues that the problems within the	Monitor and control									V	
(2007)	38(2)	al	HSA can best be understood in terms of	project work										
			a paradox: rationalization and control											
			versus local, individual freedom and											
			initiatives.				,							
Bonnal et al.	PMJ	Empiric	An overview of what CERN considers	Cost control			\checkmark						٧	
(2006)	37(1)	al	to be good requirements for an EVM											
			system suited to large-scale projects.					 ,						
Bourgault et	PMJ	Empiric	It indicates that success in managing	Manage project									γ	
al. (2008)	39(S)	al	distributed project teams is linked to	team										
			team autonomy in conducting project											

			activities and to formal decision-											
D 1			making processes.						1				_	/
Bourne and	PMJ	Empiric	It introduces and illustrates a tool for	Manage					γ				1	/
Walker (2006)	37(1)	al	measuring and visualizing stakeholder	stakeholders										
			influence on managing projects											
			drawing upon two case study examples.		,			_						,
Brandon Jr.	PMJ	Theoreti	Presents the implementation problems	Monitor and control									1	/
(1998)	29(2)	cal	and some methodology and specific	project work										
			techniques to overcome difficulties											
			related to the effective use of earned											
			value for evaluating true project											
			performance.											
Busby and	PMJ	Empiric	A "pathogen" metaphor is used to	Risk identification							1	/		
Zhang (2008)	39(3)	al	understand the internal sources of risk.											
Carbno (1999)	PMJ	Theoreti	Describes mathematical models as	Develop project							1	/		
	30(2)	cal	solution to questions that arise	management plan										
			regarding the allocation of available											
			resources to the approved projects.											
Chiocchio	PMJ	Empiric	Empirical results suggest that high-	Information										
(2007)	38(1)	al	performing teams exchanged more	distribution										
			messages, modified their exchanges											
			around milestones, and were more											
			prone to self-organize prior to project											
			completion.											
Christensen	PMJ	Empiric	Tests the assertion that changes in the	Cost control		1	/						1	/
and Gordon	29(3)	al	budgetary baseline lead to cost											
(1998)			overruns using cost performance data											
			from over 400 defense acquisition											
			contracts.											
Chung and	PMJ	Empiric	It examines the effect of social network	Manage project			Τ			T			1	/
Hossain	40(2)	al	position, structure, and ties on the	team										
(2009)			performance of knowledge-intensive											
			workers in dispersed occupational											

			communities.										
Cohen et al.	PMJ	Theoreti	It examines the control mechanisms of	Schedule		\checkmark							
(2004)	35(2)	cal	critical chain and some alternatives.	development									
Collyer et al.	PMJ	Empiric	It presents an exploratory theory-	Develop project									
(2010)	41(4)	al	building study aiming to identify the	management plan									
			project management approaches used										
			by experienced practitioners to respond										
			to rapidly changing environments.										
Conforto and	PMJ	Empiric	A method, entitled hereafter IVPM2,	Develop project									
Amaral (2010)	41(2)	al	applying agile project management	management plan									
			(APM) principles is developed and	Monitor and control									
			evaluated.	project work									
Dainty et al.	PMJ	Empiric	It examines the human resource	Human resource			7	1				 	
(2009)	40(2)	al	management practices that form the	planning									
			key components of the resourcing	Acquire project									
			process.	team									
				Develop project									
				team									
				Manage project									
				team					,		,		
Datta (2001)	PMJ	Empiric	Presents a risk management matrix for	Risk identification					\checkmark		\checkmark		
	32(2)	al	effective planning of industrial	Qualitative risk									
			projects.	analysis									
				Quantitative risk									
				analysis	_								
				Risk response									
				planning									
Denker et al.	PMJ	Theoreti	Introduces an approach known as the	Develop project							\checkmark		
(2001)	32(3)	cal	dependency structure matrix (DSM)	management plan									
			and discusses using the DSM to design										
			project plans that produce greater										
			concurrency and better iteration										
			management.		1					1			

Deng and Hung (1998)	PMJ 29(4)	Empiric al	Evaluates the feasibility of applying the integrated cost and schedule control	Monitor and control project work	\checkmark							\checkmark
			(C/S) concept Hong Kong construction	1 5								
			industry.									
Dietrich et al.	PMJ	Literatur	It presents a conceptual framework that	Manage								\checkmark
(2010)	41(4)	e review	explains the focal collaboration related	stakeholders								
			elements and their interdependencies in									
			multipartner projects.					,				
Dwivedula	PMJ	Empiric	It investigates the relationship between	Manage project								\checkmark
and Bredillet	41(4)	al	organizational and professional	team								
(2010)			commitment of project workers.			 	,		 		,	
Eden et al.	PMJ	Empiric	It examines project overruns - to	Cost estimating								
(2005)	36(2)	al	understand why and how project costs									
			escalate exponentially.				,				,	
Emhjellen et	PMJ	Empiric	Discusses the role of the	Cost estimating								
al. (2003)	34(1)	al	underestimation of expected capital									
			expenditure cost in cost overruns in									
			reference to cost overruns of oil fields									
			projects in Norway.						,	 		_
Flyvbjerg	PMJ	Theoreti	It presents a promising new approach	Risk monitoring and					γ			\checkmark
(2006)	37(3)	cal	to mitigating risk of inaccurate	control								
			forecasts of project costs, demand, and									
			other impacts based on theories of									
Q		T	decision making under uncertainty.	0 1 1 1		1			 	 	1	
Gemmill	PMJ	Theoreti	Describes a method that can provide an	Schedule		ν					ν	
(1999)	30(3)	cal	improved sequence in which to perform	development								
			the activities of a resource-constrained									
<u>C</u>	DMI		project schedule.	A		1		 	 	 	1	
Gemmill and	PMJ	I neoreti	Demonstrates the application of a	Activity resource		γ					γ	
1 sal (1997)	28(4)	cal	simple algorithm that can be easily	A stimite densitie	$\left \right $							
			applied to various kinds of resource-	Activity duration								
			duration project scheduling problems	esumating	-							
			duration project scheduling problems.	Schedule								

				development							
Globerson and	PMJ	Empiric	Evaluates the actual impact of the	Develop project							
Zwikael	33(3)	al	project manager on the quality of	management plan							
(2002)			project planning processes.								
Godé-Sanchez	PMJ	Empiric	It questions the opportunities for	Manage project							
(2010)	41(3)	al	learning lessons from the coordination	team							
			within small military teams.								
Gupta and	PMJ	Empiric	Addresses quality management issues	Quality planning					\checkmark	 \checkmark	
Graham	28(3)	al	in project-driven organizations by	Perform quality							
(1997)			presenting a case study on the quality	assurance							
			management approach.	Perform quality							
				control							
Guss (1998)	PMJ	Theoreti	Focuses on four related areas of virtual	Manage project						\checkmark	
	29(1)	cal	project management organizations and	team							
			their project teams.								
Haga and	PMJ	Theoreti	It uses a computer simulation model to	Activity resource		 \checkmark			\checkmark		
Marold (2004)	35(2)	cal	determine the order in which activities	estimating							
			should be crashed as well as the	Activity duration							
			optimal crashing strategy for a PERT	estimating							
			network to minimize the expected	Schedule							
			value of the total (crash + overrun)	development							
			cost, given a specified penalty function	Cost estimating							
			for late completion of the project.	Cost budgeting							
Hallgren and	PMJ	Empiric	It analyzes deviation, uncertainty, and	Integrated change							
Maaninen-	36(3)	al	ambiguity by examining an empirical	control							
Olsson (2005)			case study showing how one								
			organization managed the ambiguity								
			and uncertainty that project deviations								
			caused.								
Hawes and	PMJ	Empiric	It explores ways in which some	Cost estimating							
Duffey (2008)	39(1)	al	financial valuation methods, coupled								
			with reformulation of project cash								
			flows, might enhance NASA's analysis								

						 			 	 		,
			process.									
Hayes (2000)	PMJ	Literatur	Provides information on a study which	Develop project						Ī	Ī	-
	31(1)	e	evaluated the completeness and	Charter								
		Review	effectiveness of a project charter									
			template as a project management tool.									
Hegazy	PMJ	Empiric	The work operations in an actual small-	Develop project								
(2000)	31(4)	al	to-medium sized design office have	management plan								
			been analyzed for the purpose of									
			optimizing the use of resources and									
			improving work productivity.									
Herroelen et	PMJ	Theoreti	Examines fundamental elements of	Schedule								
al. (2002)	33(4)	cal	critical chain scheduling/Buffer	development								
			management (CCS/BM), the direct									
			application of the theory of constraints									
			to project management.									
Herzog (2001)	PMJ	Empiric	Explains research implications and	Develop project								
	32(1)	al	recommends specific actions for	team								
			building corporate collaborative team									
			trust.									
Hossain and	PMJ	Empiric	It hypothesizes and empirically tests	Information								
Kuti (2008)	39(4)	al	that changes to interconnectedness of	distribution								
			nodes in the network may have									
			implications on the potential to									
			coordinate.									
Huff and	PMJ	Empiric	It examines how a project manager's	Risk identification								
Prybutok	39(2)	al	prior experience and risk propensity									
(2008)			influence his or her decision making.									
Ibbs et al.	PMJ	Empiric	Studies the impact of aggressive	Integrated change								
(1998)	29(4)	al	scheduling and to quantify the cost of	control								
			changes resulting during the total									
			construction and design phases.									
Ingalls and	PMJ	Theoreti	The Qualitative Simulation Graph	Activity resource								
Douglas	35(3)	cal	Methodology (QSGM) is well suited to	estimating								

(2004)			address the PERT scheduling-with-											
			resources problem.											
Javed et al.	PMJ	Empiric	It identifies significant issues faced by	Manage										
(2006)	37(5)	al	project managers in managing	stakeholders										
			geographically distributed clients	Cost control										
			during the execution of a software											
			project and investigates the issues that											
			could have a significant contribution											
			toward overall cost reduction.											1
Jergeas (2008)	PMJ	Empiric	It focuses on the front-end loading	Develop project										
	39(4)	al	(planning) phases 1, 2, and 3 and	management plan										
			describes the effort needed to deliver											
			mega projects.					,						ļ
Jetu et al.	PMJ	Empiric	It draws on a case study conducted in	Manage project										
(2011)	42(5)	al	Ethiopia's service sector to further	team										
			understand the influence of cultural											
			patterns within Sub-Saharan Africa											
			project environments.				 							
Jiang (2001)	PMJ	Empiric	Identifies the major risks to software	Risk identification										
	32(1)	al	success and the commonly applied	Risk response										
			approaches to mitigate the risks.	planning										
Jiang et al.	PMJ	Empiric	Examines the importance of building a	Manage									\checkmark	
(2002)	33(2)	al	foundation for the user involvement in	stakeholders										
			information system projects.						,		,			ļ
Jlang et al.	PMJ	Empiric	Demonstrates a strong anticipated	Risk identification										
(2002)	33(3)	al	relationship between risk and success											
			in software development projects.			,	 				,			
Khodakarami	PMJ	Theoreti	Introduces an approach, using Bayesian	Schedule							\checkmark			
et al. (2007)	38(2)	cal	network modeling, that addresses both	development										
			uncertainty and causality in project											
			scheduling.									,		
Kloppenborg	PMJ	Theoreti	Identifies specific team virtues that are	Develop project										
and Petrick	30(2)	cal	appropriate for the typical activities and	team										

(1999)			closure documents of each project life-										
			cycle stage.										
Kloppenborg	PMJ	Empiric	Examines and classifies behaviors	Manage			-	\checkmark				\checkmark	
et al. (2006)	37(3)	al	associated with the role of a project	stakeholders									
			sponsor.										
Krane et al.	PMJ	Empiric	It examines how operational and	Qualitative risk				V					
(2010)	41(1)	al	strategic risks are distributed in the	analysis									
			projects.	Quantitative risk									
				analysis									
Kujala et al.	PMJ	Theoreti	It draws a parallel between the stage	Plan purchases and								\checkmark	
(2007)	38(4)	cal	model of negotiations and phases of the	acquisitions									
			project sales and implementation	Plan contracting									
			process, and apply the framework of	Request seller									
			negotiation analysis to the context of	responses									
			project management.	Select sellers									
				Contract									
				administration									
				Contract closure									
Kumar (1999)	PMJ	Theoreti	Discusses the linguistic labels that an	Activity resource						\checkmark			
	30(3)	cal	expert would use to describe the effects	estimating									
			of different types of resource	Schedule									
			substitutions and shows how a simple	development									
			fuzzy aggregation method can be used										
			to assess the net effect of the										
			substitutions.										
Kuprenas et	PMJ	Empiric	Presents a project quality management	Quality planning						\checkmark			
al. (1999)	30(2)	al	case study for the production of space	Perform quality									
			craft electronic components as part of	assurance									
			an overall spacecraft project.	Perform quality									
				control									
Kuruppuarach	PMJ	Empiric	It demonstrates the application of	Develop project							\checkmark		
chi (2009)	40(2)	al	virtual team concepts in a virtual	team									
			project team formed from existing										

			personnel within an organization.										
Kutsch and	PMJ	Empiric	It researches the degree of use of	Risk identification									
Hall (2009)	40(3)	al	project risk management and barriers	Qualitative risk									
			that prevent IT project managers from	analysis									
			using risk management.	Quantitative risk									
				analysis									
				Risk response									
				planning									
				Risk monitoring and									
				control									
Leach (1999)	PMJ	Theoreti	Describes the theory and practice of	Schedule							\checkmark		
	30(2)	cal	critical chain project management	development									
			(CPPM).										
Leach (2003)	PMJ	Theoreti	Describes a number of sources in bias	Activity resource									
	34(2)	cal	in performance of projects to schedule	estimating									
			and cost estimates.	Activity duration									
				estimating									
				Cost estimating			-						
Lecoutre and	PMJ	Empiric	The investigations into polar expedition	Manage project									
Lièvre (2010)	41(3)	al	projects lead to a conclusion that a	team									
			weak tie can initiate cooperation only if										
			it includes one of these two sources of										
	DIG		cooperation.	× 11						 			
Legris and	PMJ	Theoreti	It proposes an integrated approach to	Integrated change	γ								\mathcal{N}
Collerette	37(5)	cal	IT implementation, with a strong	control									
(2006)			emphasis on stakeholders' contribution.	Manage									
x 1		TD1		stakeholders				-		 			1
Levy and	PMJ	Theoreti	Discusses different methods that can be	Cost control			γ						N
Globerson	28(4)	cal	used by project and company managers										
(1997)			to reduce the negative impact of delays										
T ih e wet e we		The second '	and cost overruns.	Calcada 1		. [-+	+
Liberatore	PMJ	I heoreti	Examines differences between	Schedule		γ					γ		
(2002)	55(4)	cal	probabilistic and fuzzy approaches to	aevelopment	1								

			project schedule uncertainty analysis.								
Littau et al.	PMJ	Literatur	Literature review of stakeholder theory	Manage							
(2010)	41(4)	e review	in recent 25 years PM research.	stakeholders							
Loo (2002)	PMJ	Empiric	Discusses the application of reflective	Develop project			\checkmark				
	33(4)	al	learning journals to promote critical	team							
			self-awareness for members of project								
			management teams.								
Mallak and	PMJ	Theoreti	Analyzes crisis planning from the	Risk identification							
Kurstedt Jr.	28(2)	cal	project management perspective.	Qualitative risk							
(1997)				analysis							
				Quantitative risk							
				analysis							
				Risk response							
				planning							
McLain	PMJ	Empiric	It demonstrates the calculation and	Activity duration							
(2009)	40(4)	al	interpretation of the resulting three	estimating							
			uncertainty descriptors.								
Mead (1997)	PMJ	Theoreti	Discusses the rise of intranets and	Information							
	28(3)	cal	describes how this technology can be	distribution							
			applied to specific projects.								
Mead (2001)	PMJ	Empiric	Discusses the concepts of social	Information						 	
	32(4)	al	network analysis to diagram project	distribution							
			communication network.	Manage							
				stakeholders							
Melkonian	PMJ	Empiric	Based on an in-depth qualitative study	Develop project			\checkmark				
and Picq	41(3)	al	of their project-based mode of	team							
(2010)			operations, the study details the six								
			main ingredients of the collective								
			competence.								
Miranda and	PMJ	Theoreti	It posits that project contingencies	Cost control							
Abran (2008)	39(3)	cal	should be based on the amount it will								
			take to recover from the								
			underestimation. A model to calculate								

			the required funds is developed.										
Murmis	PMJ	Theoreti	Describes a mathematical model used	Monitor and control									\checkmark
(1997)	28(3)	cal	to build the `S' accumulated progress	project work									
			curves with normal distribution.										
Nogueira and	PMJ	Theoreti	It provides some recommendations	Develop project			\checkmark				-	\checkmark	
Raz (2006)	37(2)	cal	regarding the structure and flexibility	team									
			of project teams operating in turbulent										
			environments.										
Norrie and	PMJ	Empiric	It discusses ways that project managers	Manage project			\checkmark						\checkmark
Walke (2004)	35(4)	al	can use measurement (using a tool such	team									
			as the balanced scorecard) to improve										
			the operational performance of their										
			project teams.										
Ohtaka and	PMJ	Empiric	It constructs a causal model and	Risk identification					\checkmark				
Fukazawa	41(1)	al	clarifies that it can contribute to the										
(2010)			easier recognition of SPPs empirically.										
Ortiz de Orue	PMJ	Empiric	It integrates a validated project	Develop project									
et al. (2009)	40(2)	al	organization design simulation tool	management plan									
			(Virtual Design Team) with a robust										
			design experimental method to enable										
			robust project network design.										
Pavlak (2004)	PMJ	Theoreti	Pragmatic project management	Risk monitoring and				•	\checkmark				\checkmark
	35(4)	cal	involves a practical balance between	control									
			proactive risk management tools and										
			reactive problem-solving tools.										
Peterson	PMJ	Theoreti	It is in the project manager's best	Manage project									\checkmark
(2007)	38(4)	cal	interest to drive toward project success	team									
			through the creation and maintenance										
			of a motivating environment for all										
			members of the team.										
Petit and	PMJ	Empiric	It studies how uncertainty is affecting	Integrated change									\checkmark
Hobbs (2010)	41(4)	al	project portfolios managed in dynamic	control									
			environments.										

Piney (2003)	PMJ	Theoreti	Challenge of managing project risk in	Risk response									
	34(3)	cal	line with stakeholder expectations;	planning									
			Application of utility curve to project										
			management.			,							
Pollack-	PMJ	Theoreti	It presents a scenario for modeling and	Activity duration									
Johnson and	36(1)	cal	analyzing projects with significant	estimating									
Liberatore			uncertainty in their network structure	Schedule									
(2005)			and/or durations of some activities.	development									
Pruitt (1999)	PMJ	Theoreti	Explores the role of SE in three areas:	Integrated change									
	30(3)	cal	early definition and preliminary design,	control									
			control of changes, and the final phase	Close project									
			of test verification, and validation.										
Pyra and	PMJ	Empiric	Examines the risk management system	Risk monitoring and					\checkmark			\checkmark	
Trask (2002)	33(2)	al	within communication management	control									
			system for software development and										
			system integration project.										
Raz (2003)	PMJ	Literatur	Brief overview of Critical Chain	Schedule									
	34(4)	e	Project Management (CCPM).	development									
		Review											
Raz and	PMJ	Theoreti	Presents the main considerations	Create WBS									
Globerson	29(4)	cal	relevant to determining the size and										
(1998)			contents of work packages.										
Récopé et al.	PMJ	Empiric	The conclusions lead to a	Develop project									
(2010)	41(3)	al	reconsideration of how to recruit for	team									
			project teams.										
Regev et al.	PMJ	Theoreti	It describes a new approach for dealing	Risk identification									
(2006)	37(5)	cal	with technological projects—an	Qualitative risk									
			approach based on the analysis of	analysis									
			knowledge gaps.	Quantitative risk									
				analysis									
				Risk monitoring and									
				control									
Robinson	PMJ	Theoreti	Provides a statistical perspective of the	Monitor and control									

(1997)	28(2)	cal	development of the performance measurement baseline (PMB) in project management.	project work									
Rose and Manley (2010)	PMJ 41(1)	Empiric al	It demonstrates the features of a positively geared procurement approach that promotes the effectiveness of financial incentives.	Contract administration						\checkmark		\checkmark	
Royer (2000)	PMJ 31(1)	Theoreti cal	Addresses the underlying process of successful risk management.	Risk identification Risk response planning					\checkmark				
Rozenes et al. (2006)	PMJ 37(4)	Literatur e Review	It reviews the current literature on project control systems.	Monitor and control project work	\checkmark							\checkmark	
Sadeh (2000)	PMJ 31(3)	Empiric al	Reveals the effect of the contract type on the success of defense projects contingent with the level of technological uncertainty existing at the beginning of the project.	Plan contracting						\checkmark	\checkmark		
Sánchez and Pérez (2004)	PMJ 35(1)	Empiric al	It shows the results from a survey of Spanish industrial companies on the use of early warning signals for the earliest possible identification of failing research and development (R&D) projects.	Monitor and control project work	V								
Sanchez et al. (2008)	PMJ 39(3)	Theoreti cal	It introduces a framework to identify risks and opportunities during portfolio risk management that helps to decrease the uncertainty of achieving the strategic goals of the organization.	Risk identification					\checkmark				
Selinger (2001)	PMJ 32(1)	Theoreti cal	Discusses the project management concept of critical path analysis and the engineering concept of hardware system timing analysis.	Schedule development		\checkmark							

Sense (2003)	PMJ	Theoreti	Offers a conception of a project team	Manage project									
	34(3)	cal	from a learning perspective.	team									
Sewchurran	PMJ	Empiric	It explores the role played by the	Manage				\checkmark					
and Barron,	39(S)	al	project sponsor and project manager in	stakeholders									
(2008)			successfully delivering information										
			technology (IT) projects.										
Sharma et al.	PMJ	Empiric	It aims to identify and gauge the	Risk identification									
(2011)	42(5)	al	software risk dimensions and analyze										
			the differences of perception among										
			executives toward software risks.										
Siqueira	PMJ	Theoreti	Presents an automated cost estimating	Cost estimating									
(1999)	30(1)	cal	(ACE) system for low-rise structural										
			steel buildings.										
Smith and	PMJ	Empiric	It identifies four major independent	Schedule control									
Flanegin	37(1)	al	factor score constructs of time										
(2006)			management, cross-functional teams,										
			management relinquishing authority,										
			and co-location of project team										
			members.						,		,		
Steffey and	PMJ	Theoreti	It provides scholarly research into the	Risk identification					\checkmark				
Anantatmula	42(3)	cal	risks that inherently affect an										
(2011)			international project's success and										
			provides insight into the effective										
~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~			measures.					1					
Sutterfield et	PMJ	Empiric	Stakeholder theory serves as the	Manage				V					
al. (2006)	37(5)	al	theoretical underpinning of a case study	stakeholders									
			of a failed project, which identifies the										
T 1 (200 c)			potential causes of the project failure.	D11					1		1		
Taylor (2006)	PMJ	Empiric	It reports findings from an exploratory	Risk response					γ		\mathbf{N}		
	37(5)	al	field study of risk management and	planning	-								
			problem resolution strategies used by	Risk monitoring and									
	D1	— · ·	project managers.	control	,			 			,	,	
Thomas et al.	PMJ	Empiric	It proposes the process for	Develop project								\mathbf{N}	

(2008)	39(4)	al	accomplishing the integration of	management plan							
			project planning, project planning and	Monitor and control							
			control development, and project team	project work							
			building.	Develop project							
				team							
Thomas	PMJ	Theoreti	Describes a Windows-compatible	Performance							
(1999)	30(4)	cal	software application designed for	reporting							
			project manager use in assessing team								
			communications during the design and								
			construction phases of engineering,								
			procurement, and construction projects.								
Trietsch	PMJ	Theoreti	It shows that PERT/CPM had been an	Activity sequencing							
(2005)	36(1)	cal	instance of Goldratt's 'Theory of	Activity resource							
			Constraints' (TOC) before Goldratt had	estimating							
			articulated it.	Activity duration							
				estimating							
				Schedule							
				development							
Vanhoucke	PMJ	Empiric	Shows that scheduling the project	Schedule							
and	34(1)	al	activities with certain techniques will	development							
Demeulemees			improve the financial status of a								
ter (2003)			project.								
Vanhoucke et	PMJ	Empiric	The Project Scheduling Game is an IT-	Activity sequencing		 					
al. (2005)	36(1)	al	supported simulation game that	Activity resource							
			illustrates the complexity of scheduling	estimating							
			a real-life project.	Activity duration							
				estimating							
				Schedule							
				development							
				Cost estimating							
				Cost budgeting							
Waterworth	PMJ	Theoreti	Discusses the theory on the derivation	Activity duration							
(2000)	31(1)	cal	and applications of learning-curve.	estimating							

Webber	PMJ	Empiric	It examines the effectiveness of	Develop project							
(2008)	39(2)	al	"teaming with the client," using	team							
			blended service provider-client teams								
			as an organizational strategy for								
			achieving effective co-production								
			engagements.								
Whitehouse	PMJ	Theoreti	Examines the use of Brooks Algorithm	Schedule							
and DePuy	32(4)	cal	in solving constrained multiple source	development							
(2001)			single-project networks.	_							
Williams	PMJ	Theoreti	It shows the importance of the	Qualitative risk							
(2004)	35(3)	cal	omission of taking action to recover	analysis							
			late-running projects and discusses								
			simple and easily coded models of								
			project-management actions.								
Yates and	PMJ	Empiric	Analyzes the types of delays affecting	Develop project	 						
Eskander	33(1)	al	the planning and scope development of	management plan							
(2002)			construction projects.	Scope planning							
Zhang (2011)	PMJ	Literatur	It aims to locate the position of past	Qualitative risk				\checkmark			
	42(4)	e	studies on project risk found between	analysis							
		Review	the two schools of risk analysis and to	Quantitative risk							
			help understand their basic assumptions	analysis							
			and viewpoints								
Zhang and Xu	PMJ	Theoreti	It analyzes Six Sigma to propose major	Perform quality							
(2008)	39(4)	cal	revisions to the R&R model.	assurance							
				Perform quality							
				control							
Zwikael et al.	PMJ	Theoreti	Addresses how to estimate the final	Cost estimating						\checkmark	\checkmark
(2000)	31(1)	cal	cost of a project and when the estimate	Cost control							
			become accurate.								

(K1: Integration Management, K2: Scope Management, K3: Time Management, K4: Cost Management, K5: Quality Management, K6: Human Resource Management, K7: Communications Management, K8: Risk Management, K9: Procurement Management, P1: Initiating, P2: Planning, P3: Executing, P4: Monitoring and Controlling, P5: Closing)

		Project Manag	ement Proces	ses Groups	
Knowledge	Initiating	Planning	Executing	Monitoring	Closing
Areas				and	_
				Controlling	
Integration	Develop	Develop project	Direct and	Monitor and	Close project
Management	project	management plan	manage	control project	
	Charter		project	work	
	Develop		execution	Integrated	
	preliminary			change control	
	project				
	scope				
	statement				
Scope		Scope planning		Scope	
Management		Scope definition		verification	
		Create WBS		Scope control	
Time		Activity definition		Schedule	
Management		Activity sequencing		control	
		Activity resource			
		estimating			
		Activity duration			
		estimating			
		Schedule			
		development			
Cost		Cost estimating		Cost control	
Management		Cost budgeting			
Quality		Quality planning	Perform	Perform quality	
Management			quality	control	
_			assurance		
Human Resource		Human resource	Acquire	Manage project	
Management		planning	project team	team	
			Develop		
			project team		
Communications		Communications	Information	Performance	
Management		planning	distribution	reporting	
				Manage	
				stakeholders	
Risk		Risk identification		Risk	
Management		Qualitative risk		monitoring and	
		analysis		control	
		Quantitative risk			
		analysis			
		Risk response			
		planning			

Table 2: Conceptual Framework For Classifying The Project Management Research (Adapted From The PMBOK Guide)

Procurement	Plan purchases and	Request	Contract	Contract
Management	acquisitions	seller	administration	closure
		responses		
	Plan contracting	Select sellers		

Knowledge Areas	Process Groups	Process	References
Integration	Initiating	Develop project Charter	[49]
Management	_	Develop preliminary	
		project scope statement	
	Planning	Develop project	[11][24][29][30][33][42][50][58][90][1
		management plan	18][127]
	Executing	Direct and manage project execution	
	Monitoring	Monitor and control	[6][12][15][18][22][30][34][86][102][1
	and	project work	05][107]
	Controlling		[118]
	_	Integrated change control	[10][47][55][75][93][96]
	Closing	Close project	[96]
Scope	Planning	Scope planning	[127]
Management		Scope definition	
		Create WBS	[99]
	Monitoring	Scope verification	
	and	Scope control	
	Controlling		
Time	Planning	Activity definition	[1]
Management		Activity sequencing	[1][120][122]
		Activity resource estimating	[1][41][46][56][68][73][120][122]
		Activity duration	[1][5][41][46][73][81][95][120][122][1
		estimating	23]
		Schedule development	[1][13][28][40][41][46][51][63][68][72] [77][95]
			[98][109][120][121][122][125]
	Monitoring and	Schedule control	[8][114]
	Controlling		
Cost	Planning	Cost estimating	[4][37][38][46][48][73][113][122][130]
Management	_	Cost budgeting	[46][122]
	Monitoring and	Cost control	[7][19][26][57][76][85]
	Controlling		

Table 3: Research on Project Management Practices

Ouality	Planning	Ouality planning	[44][69]
Management	Executing	Perform quality assurance	[44][69][129]
C	Monitoring	Perform quality control	[44][69][129]
	and	1 2	
	Controlling		
Human	Planning	Human resource planning	[31]
Resource	Executing	Acquire project team	[31]
Management		Develop project team	[17][31][52][64][70][79][84][87][100][
			118][124]
	Monitoring	Manage project team	[3][9][20][27][31][36][43][45][59][74][
	and		88][92]
	Controlling		[110]
Communicatio	Planning	Communications planning	[2]
ns	Executing	Information distribution	[12][14][25][53][82][83]
Management	Monitoring	Performance reporting	[14][119]
	and	Manage stakeholders	[14][21][35][57][61][65][75][78][83][1
	Controlling		11][116]
Risk	Planning	Risk identification	[23][32][54][60][62][71][80][89][101][
Management			104][108][112][115]
		Qualitative risk analysis	[32][66][71][80][101][126][128]
		Quantitative risk analysis	[32][66][71][80][101][128]
		Risk response planning	[32][60][71][80][94][104][117]
	Monitoring	Risk monitoring and	[39][71][91][97][101][117]
	and	control	
	Controlling		
Procurement	Planning	Plan purchases and	[16][67]
Management		acquisitions	
		Plan contracting	[16][67][106]
	Executing	Request seller responses	[16][67]
		Select sellers	[16][67]
	Monitoring	Contract administration	[16][67][103]
	and		
	Controlling		
	Closing	Contract closure	[67]

Table 4: Distribution of Studies By Year

Year	References	Amount	Percentage
2011	[59][112][115][128]	4	3.1%
2010	[3][10][29][30][35][36][43][66][74][78][84][89][93][100][15	11.5%
	103]		
2009	[27][31][70][71][81][90]	6	4.6%
2008	[16][20][23][48][53][54][58][85][108][111][118][124][129	13	10%

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2007	[7][18][25][63][67][92]	6	4.6%
2006	[19][21][41][57][65][75][87][101][105][114][116][117]	12	9.2%
2005	[37][47][95][120][122]	5	3.8%
2004	[8][28][46][56][88][91][107][126]	8	6.2%
2003	[6][9][12][38][73][94][98][110][121]	9	6.9%
2002	[42][51][61][62][77][79][97][127]	8	6.2%
2001	[1][15][32][33][52][60][83][109][125]	9	6.9%
2000	[2][4][11][49][50][104][106][123][130]	9	6.9%
1999	[14][17][24][40][64][68][69][72][96][113][119]	11	8.5%
1998	[5][13][22][26][34][45][55][99]	8	6.2%
1997	[41][44][76][80][82][86][102]	7	5.4%
Total		130	100%

Table 5: Distribution of Articles By Research Method

Research Method	Amount	Percentage
Theoretical	52	40%
Empirical	71	54.6%
Literature review	7	5.4%
Total	130	100%

Table 6: Distribution of Studies by Project Management Knowledge Areas

Knowledge	Process Croups	Drogoss	Amoun	Dorcontago	
Areas	Areas Process Groups Process		t	rercentage	
Integration			31	15.7%	
Management	Initiating	Develop project Charter	1	0.5%	
		Develop preliminary			
		project scope statement			
	Planning	Develop project	11	5.6%	
		management plan			
	Executing	Direct and manage project			
		execution			
	Monitoring and Controlling	Monitor and control	12	6%	
		project work			
		Integrated change control	6	3%	
	Closing	Close project	1	0.5%	
Scope			2	1%	
Management	Planning	Scope planning	1	0.5%	
	_	Scope definition			
		Create WBS	1	0.5%	
	Monitoring and Controlling	Scope verification			
		Scope control			
Time			42	21.2%	

Management	Planning	Activity definition		1		0.5%
_		Activity sequencing		3		1.5%
		Activity resource		8		4%
		estimating				
		Activity duration		10		5%
		estimating				
		Schedule development		18		9.1%
	Monitoring and Controlling	Schedule control		2		1%
Cost			17		8.6%	
Management	Planning	Cost estimating		9		4.5%
		Cost budgeting		2		1%
	Monitoring and Controlling	Cost control		6		3%
Quality			8		4%	
Management	Planning	Quality planning		2		1%
	Executing	Perform quality assurance		3		1.5%
	Monitoring and Controlling	Perform quality control		3		1.5%
Human			26		13.1%	
Resource	Planning	Human resource planning		1		0.5%
Management	Executing	Acquire project team		1		0.5%
Ū.	C	Develop project team		11		5.6%
	Monitoring and Controlling	Manage project team		13		6.6%
Communicatio			20		10.1%	
ns	Planning	Communications planning		1		0.5%
Management	Executing	Information distribution		6		3%
Ū.	Monitoring and Controlling	Performance reporting		2		1%
		Manage stakeholders		11		5.6%
Risk			39		19.7%	
Management	Planning	Risk identification		13		6.6%
C	C C	Oualitative risk analysis		7		3.5%
		Quantitative risk analysis		6		3%
		Risk response planning		7		3.5%
	Monitoring and Controlling	Risk monitoring and		6		3%
		control				
Procurement			13		6.6%	
Management	Planning	Plan purchases and		2		1%
U		acquisitions				
		Plan contracting		3		1.5%
	Executing	Request seller responses		2		1%
		Select sellers		2		1%
	Monitoring and Controlling	Contract administration		3		1.5%
	Closing	Contract closure		1	1	0.5%
Total			198		100%	

Table 7: Distribution of Studies by Project Process Groups

Process Groups	Knowledge Areas	Amount	Percentage
Initiating		1	0.5%
C	Integration Management	1	0.5%
Planning		106	53.5%
	Integration Management	11	5.6%
	Scope Management	2	1%
	Time Management	40	20.2%
	Cost Management	11	5.6%
	Quality Management	2	1%
	Human Resource Management	1	0.5%
	Communications Management	1	0.5%
	Risk Management	33	16.7%
	Procurement Management	5	2.5%
Executing	-	25	12.6%
	Quality Management	3	1.5%
	Human Resource Management	12	6.1%
	Communications Management	6	3%
	Procurement Management	4	2%
Monitoring		64	32.2%
and	Integration Management	18	9.1%
Controlling	Time Management	2	1%
	Cost Management	6	3%
	Quality Management	3	1.5%
	Human Resource Management	13	6.6%
	Communications Management	13	6.6%
	Risk Management	6	3%
	Procurement Management	3	1.5%
Closing		2	1%
	Integration Management	1	0.5%
	Procurement Management	1	0.5%
Total		198	100%