Certified Associate in Project Management (CAPM) Role Delineation Study

Project Management Institute

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Preface

The Project Management Institute (PMI®) has developed an "associate-type" certification, the Certified Associate in Project Management (CAPM™). This certification applies to the practitioners who provide project management services, but do not have the experience required to apply for Project Management Professional (PMP®) certification.

The major steps of examination development include:

1. Analyzing the responsibilities of CAPM candidates
2. Specifying a plan for the test
3. Writing, reviewing, referencing, and validating questions
4. Assembling the examination
5. Deciding the score required for passing the test.

A role delineation study addresses the first two steps of examination development, and is the foundation of a fair and defensible certification examination.

Because of the high-stakes nature of the PMI certification examinations, and because of PMI's goal to provide protection for consumers, it is imperative that the CAPM examination be fair and reflect the associate role. This goal of fairness applies to both those taking the examination and to those who will rely on the certification in making staffing and other decisions involved in effectively managing their projects.

PMI began developing the CAPM subsequent to a recommendation by the Certification Board Center (CBC). The CBC is a PMI Board responsible for governance and oversight of PMI's certification program. Upon approval at their January 2001 meeting, the CBC decided, after nearly two years of requests, to develop a certification for individuals who were involved in projects, but who did not meet the education and experience required of the PMP certification. The Board's decision led to the execution during 2001 of PMI's methodology for examination development summarized in this document.

The CAPM certification is designed to support and expand the project management profession, as well as practitioners' attainment of their developmental and career goals. It is hoped that acquiring and maintaining this credential will have a positive impact on practitioners' professional knowledge and skill level, project assignment opportunities, and performance.

Analyzing the Responsibilities of Certified Associates in Project Management

The first step in developing a certification examination is to define the profession. It must be known what CAPM candidates actually do on a job before a test can be developed that is fair, or in more technical terms, content-valid. A content-valid examination draws questions from every important

domain of the job, while specifying that those domains of the job that are more important, critical, and relevant should be represented by more questions on the examination.

Defining the associate level of the project management profession involves technical advisers defining the responsibilities of CAPMs, as well as individuals working in the project management field validating responsibilities identified by the technical advisers.

Defining the responsibilities of Certified Associates in Project Management. In 2001, in a series of meetings sponsored by PMI, technical advisers who were recognized as experts in the field of project management developed a comprehensive description of the work that CAPM candidates perform. The technical advisers, working under the direction of PMI Headquarters, reached consensus on the performance domains that define the profession. A performance domain is a broad category of performance; the technical advisers identified six domains that are important for competent performance as a CAPM: Initiating the Project, Planning the Project, Executing the Project, Controlling the Project, Closing the Project, and Professional Responsibility.

Next, technical advisers defined the tasks that are important for each domain, along with statements about the knowledge and skills that are important for performing each task competently. For example, the first task identified under Initiating the Project was: Assist in formalizing project goals by working with identified stakeholders to facilitate meeting their requirements, specifications, and/or expectations. These domains, tasks, and knowledge and skill statements define the associate level of the profession and form the content outline of the examination.

Validating the responsibilities identified by the technical advisers. In order to ensure the validity of the study and content outline developed by the panel of technical advisers, a survey requesting feedback on the panel's work was sent to individuals working at the CAPM level. A web-based survey was distributed by email to two groups, totaling 2,103 potential participants throughout the world. The first group consisted of 1,858 PMI members who were not PMPs, with 441 returned, for a response rate of 24 percent. Based on their reported experience, it was thought that they were likely candidates for the CAPM credential. A smaller sample of 245 PMPs with greater than four years of experience were invited to participate, with 68 returned, for a response rate of 28 percent. The perspectives of both groups were essential to develop a balanced understanding of the CAPM role.

The survey respondents evaluated the domains and the tasks identified by the technical experts by evaluating the importance, criticality, and frequency on a five-point Likert scale. The Importance assessment factor reflects the level of contribution of the task and domain to the success of the project. The Criticality factor is defined as the level of harm that not performing the task properly would cause to achieving the project's objectives within the constraints that exist. Frequency is defined as the percentage of time a CAPM would spend performing the task being evaluated. The sum of the time spent on the tasks within a domain defined how many questions/items would need to be developed for that domain.

Results of the study indicated that the 150 questions should be distributed among the following domains:

Domains	The number of items for each domain is:
I. Initiating the Project	14
II. Planning the Project	33
III. Executing the Project	40
IV. Controlling the Project	32
V. Closing the Project	14
VI. Professional Responsibility	17

Introduction

In early 2001, a series of meetings of the technical advisers who were recognized experts in the field of Project Management occurred. At these meetings, a comprehensive description of the work that Certified Associate in Project Management (CAPM) candidates perform was developed. The technical advisers reached consensus on the performance domains, the tasks that define the profession, and an initial assessment of their importance, criticality, and frequency of performance.

The major function of the Project Management Institute (PMI) credentialing program is to promote professionalism in the field of Project Management. It provides a measure of assurance that the CAPM has an associate level of knowledge of the Project Management profession.

The development of a quality credentialing or licensing program must follow certain logically sound and legally defensible procedures for developing examinations. These principles and procedures are outlined in federal regulations, such as Uniform Guidelines on Employee Selection Procedures, and manuals, such as Standards for Educational and Psychological Testing (1999). PMI utilized these materials in developing examinations for its certification programs.

Before a content-valid certification examination is developed, the knowledge and skills needed to provide services must be determined. The process for identifying these areas is a role delineation, or job analysis, which serves as a blueprint for examination development. The job analysis also helps to determine the type of examination, such as written or practical, to be developed in order to assess level of knowledge and application.

The critical reason for conducting a role delineation study is to ensure that an examination is content-valid. Content validity is the most commonly applied and accepted validation strategy utilized in establishing certification programs today. In psychometric terms, validation is the way a test developer documents that the level of knowledge and application to be inferred from a test score is actually measured by the examination. A content-valid examination, then, appropriately evaluates knowledge or skills required to function as a practitioner in the field. A content-valid examination contains a representative sample of items that measure the knowledge or skills contained in the profession being tested.

Thus, PMI's role delineation study consisted of the following four phases, which are the focus of this Study:

1. *Initial Development and Evaluation.* The 11-member Role Delineation Panel identified the domains, tasks, knowledge, and skills essential to the performance of a CAPM.

2. *Integration.* During this phase, individuals integrated and consolidated the panel's initial findings, refined the task statements and ratings, and returned the results to the Panel for an additional review prior to the validation phase.

3. *Validation.* A web-based survey was developed using the domains and tasks identified by the Role Delineation Panel and distributed to 2,103 potential participants.

4. Development of Test Specifications. Based on the ratings gathered from the representative sample of professionals, test specifications for the certification examination were developed.

Phase I:
Initial Development and Evaluation

The first steps in analyzing the associate level of the Project Management profession were the identification of the major content areas, or domains, the listing of tasks performed under each domain, and the identification of the knowledge and skills associated with each task.

In February 2001, the Project Management Institute assembled an 11-member panel of subject matter experts in the Project Management field to define, discuss, and develop initial documentation of the role of a Certified Associate in Project Management (CAPM). The selected group of technical advisers represented a wide range of experience, educational disciplines, industries, organizational positions, locations, and both genders. The following steps were undertaken to complete Phase I:

1. The panel determined that the associate level of the Project Management profession could be divided into six major content areas, or performance domains. These performance domains are:

- Initiating the Project
- Planning the Project
- Executing the Project
- Controlling the Project
- Closing the Project
- Professional Responsibility.

2. Next, the Panel delineated the tasks in each of the six domains. The Panel subsequently generated a list of knowledge and skills required to perform each task.

3. The Panel members then evaluated each performance domain and task, rating each on importance and criticality to the CAPM, and the frequency with which the activities associated with each domain and task are performed. The performance domains and task ratings were then subjected to an additional review in Phase II.

Phase II: Integration

In March 2001, a comprehensive report was produced using the information provided and agreed on by this core group. It included the general requirements, the task statements, and the knowledge and skill requirements, as well as a statistical analysis of the domain and task ratings on importance, criticality, and frequency.

Each of the Panel members was asked to review the comprehensive report on the Certified Associate in Project Management (CAPM) and make appropriate changes. The CAPM information was sent to this pilot group a number of times. This allowed each individual to review the changes that were made by others within the pilot group. A final conference call was held to agree upon what changes were appropriate. Most changes that were made reflected the basic requirements of the CAPM. The general description of the CAPM credential was altered to accommodate the ratings of importance, criticality, and frequency that occurred in Phase I. The next phase was validation.

Phase III: Validation Study

Questionnaire Design and Distribution

Using the domains and tasks identified by the Role Delineation Panel, PMI developed a web-based questionnaire to be completed by a global sample of professionals in the field of project management. The Project Management Institute (PMI) distributed the surveys to 2,103 professionals to evaluate, validate, and provide feedback to the Role Delineation Panel's domain and task lists. The questionnaire also solicited biographical information from the respondents in order to ensure a representative response and completion by appropriately qualified individuals.

The questionnaire was distributed to two groups. The first group consisted of 1,858 PMI members who were not Project Management Professionals (PMPs), with 441 returned, for a response rate of 24 percent. Based on their reported experience, it was thought that they were likely candidates for the Certified Associate in Project Management (CAPM) credential. The second group consisted of a smaller sample of 245 PMPs with greater than four years of experience, with 68 returned, for a response rate of 28 percent.

Who Responded to the Survey?

As reflected in the demographic data on the following pages, survey respondents represent a diverse, global population. As shown in the charts, 70 percent of the respondents resided in North America, with 12 percent in Western Europe and 10 percent in East Asia and Pacific.

YOUR PLACE OF RESIDENCE		
	Frequency	Percent
North America	357	70%
Central America and Caribbean	4	1%
South America	14	3%
Western Europe	60	12%
Eastern Europe/ former Soviet Union	5	1%
Middle East and South-Central Asia	16	3%
East Asia and Pacific	51	10%
Africa	2	0%

HIGHEST LEVEL OF FORMAL EDUCATION COMPLETED		
	Frequency	**Percent**
High School or Equivalent	24	5%
Some College or University	87	17%
Bachelor's Degree or Equivalent	223	44%
Master's Degree	165	33%
Doctorate	16	2%

Additionally, 44 percent of survey respondents indicated that they had a Bachelor's degree or equivalent and 33 percent indicated a Master's degree.

Survey respondents were also asked about their work experiences. The majority of respondents (61 percent) indicated that they have attended at least one employer-specific course of study in project management, and a majority of respondents indicated that their primary affiliation is Software Development/Application (30 percent). Additionally, although the majority of respondents (73 percent) reported at least six years in project management, the majority (68 percent) have held their current position for five years or less.

(Please note that, due to rounding of numbers, the percent total does not equal 100 percent for most charts.)

WHAT FORMAL COURSE OF STUDY IN PROJECT MANAGEMENT HAVE YOU COMPLETED?		
	Frequency	**Percent**
Master's Certificate Program	64	13%
University Degree Program	51	10%
Employer-Specific Program	300	61%
None	84	17%

YEARS OF EXPERIENCE IN PROJECT MANAGEMENT		
	Frequency	**Percent**
0–5 Years	132	26%
6–9 Years	148	29%
10–14 Years	116	23%
15–19 Years	63	12%
20–24 Years	32	6%
25+ Years	17	3%

WHAT GENERAL INDUSTRY AREA BEST DESCRIBES WHERE YOU PRACTICE PROJECT MANAGEMENT?		
	Frequency	**Percent**
Software Development/ Application	151	30%
Hardware Development/ Application	21	4%
Communications/ Networking	80	16%
Construction	20	4%
Manufacturing	22	4%
Transportation	4	1%
Resources	2	0%
Management	26	5%
Financial Services	26	5%
Engineering	41	8%
Training/ Consulting	25	5%
Academic	2	0%
Other	65	13%

HOW LONG HAVE YOU HELD THIS CURRENT POSITION?		
	Frequency	Percent
0–5 Years	348	68%
6–9 Years	88	17%
10–14 Years	49	10%
15–19 Years	16	3%
20–24 Years	6	1%
25+ Years	2	0%

Evaluation of Performance Domains

Survey respondents'evaluations. The survey respondents were asked to evaluate each performance domain and task, rating each on importance, criticality, and frequency. A five-point scale was used for the importance and criticality ratings, with a "5" representing the highest rating. The scale anchors for importance and criticality are listed here as a reference. For the frequency ratings, survey respondents were asked to estimate the percentage of projects on which a CAPM would perform the activities associated with the particular domain being rated.

Importance Ratings

1. *Not Important.* Performance of tasks in this domain is not essential to the job performance of the CAPM.

2. *Somewhat Important.* Performance of tasks in this domain is minimally essential to the job performance of the CAPM.

3. *Important.* Performance of tasks in this domain is moderately essential to the job performance of the CAPM.

4. *Very Important.* Performance of tasks in this domain is clearly essential to the job performance of the CAPM.

5. *Extremely Important.* Performance of tasks in this domain is absolutely essential to the job performance of the CAPM.

As depicted in the following chart, survey respondents indicated that Domain II is the most important of the three domains. Domain IV was considered the second-most important, followed by Domains III and VI.

DOMAIN	IMPORTANCE				
	Sample Size (N)	Mean	Range of Responses	Standard Error of Mean	Standard Deviation
I. Initiating the Project	507	3.35	1-5	Null	1.08
II. Planning the Project	507	4.21	1-5	0.04	0.92
III. Executing the Project	507	4.04	1-5	0.04	0.82
IV. Controlling the Project	506	4.13	1-5	0.04	0.87
V. Closing the Project	505	3.44	1-5	0.04	0.94
VI. Professional Responsibility	499	4.04	1-5	0.04	0.92

Criticality Ratings

1. No Harm. Inability to perform tasks in this domain would have no adverse consequences.

2. Minimal Harm. Inability to perform tasks in this domain would lead to error with minimal adverse consequences.

3. Moderate Harm. Inability to perform tasks in this domain would lead to error with moderate adverse consequences.

4. *Significant Harm.* Inability to perform tasks in this domain would lead to error with major adverse consequences.

5. Extreme Harm. Inability to perform tasks in this domain would lead to error with severe adverse consequences.

The respondents indicated that Domain II was the most critical, followed by Domain III and closely by Domain IV.

DOMAIN	CRITICALITY				
	Sample Size (N)	Mean	Range of Responses	Standard Error of Mean	Standard Deviation
I. Initiating the Project	508	3.19	1-5	0.05	1.05
II. Planning the Project	506	4.14	1-5	0.04	0.88
III. Executing the Project	507	4.05	1-5	0.04	0.82
IV. Controlling the Project	506	4.04	1-5	0.04	0.85
V. Closing the Project	505	3.06	1-5	0.04	0.92
VI. Professional Responsibility	499	3.74	1-5	0.04	0.94

Frequency Ratings

Respondents were also asked to estimate the percentage of projects on which CAPMs would perform duties associated with each domain. Again, Domains II, III, and IV received the highest ratings, though in a different pattern than the ratings for importance and criticality. For the frequency ratings, Domain III received the highest ratings, followed by Domains IV and II.

DOMAIN	FREQUENCY				
	Sample Size (N)	Mean Percentage	Range of Responses	Standard Error of Mean	Standard Deviation
I. Initiating the Project	508	10%	0-80%	0.34	7.60
II. Planning the Project	506	21%	0-100%	0.48	10.82
III. Executing the Project	507	27%	0-100%	0.57	12.97
IV. Controlling the Project	506	22%	0-100%	0.48	10.75
V. Closing the Project	505	9%	0-100%	0.31	7.09
VI. Professional Responsibility	499	11%	0-100%	0.48	10.78

Panel members'evaluation versus respondents'evaluations. The evaluations of domains by the panel members were compared to the evaluations by the survey respondents to ensure that the results were similar. As depicted in the following graph, both groups rated the importance of the domains similarly. While there were minor variations between the two groups, both the panel and the respondents rated Domains II, III, IV, and VI as the most important domains.

DOMAIN	IMPORTANCE		
	Survey Mean	Panel Mean	Difference*
I. Initiating the Project	3.35	2.7	.65
II. Planning the Project	4.21	4.0	.21
III. Executing the Project	4.04	4.5	-.46
IV. Controlling the Project	4.13	3.8	.33
V. Closing the Project	3.44	2.8	.64
VI. Professional Responsibility	4.04	4.0	.04

*Survey Mean - Panel Mean

The two groups ranked the criticality of the domains similarly, as well. Again, Domains II, III, and IV were rated as the most critical by both groups.

DOMAIN	CRITICALITY		
	Survey Mean	Panel Mean	Difference*
I. Initiating the Project	3.19	2.6	.59
II. Planning the Project	4.14	3.6	.54
III. Executing the Project	4.05	4.0	.05
IV. Controlling the Project	4.04	4.0	.04
V. Closing the Project	3.06	2.2	.86
VI. Professional Responsibility	3.74	3.2	.54

* Survey Mean - Panel Mean

Summary of Results

As shown in the charts on the preceding pages, the survey respondents indicated that all domains are important. On a scale of 1 to 5, all of the domains had average importance ratings above the scale midpoint of *3*, and four of the domains had average importance ratings above 4 (Very Important).

Similarly, the respondents considered all the domains to be critical. All of the domains had average criticality ratings above the scale midpoint of *3*, and three of the domains had average criticality ratings above 4, which means that incompetent performance of tasks in those domains could result in Significant-to-Extreme Harm to the client, the CAPM, the public, and so on. The survey respondents indicated the tasks of each domain were performed in a similar pattern, where domains II, III, and IV were estimated to consume 21 percent, 27 percent, and 22 percent, respectively, of the CAPM's time.

Conclusion

The results of the survey validate the results of the Role Delineation Panel. This conclusion means that the domains, tasks, knowledge, and skills developed by the Role Delineation Panel constitute an accurate definition of the work of a credentialed CAPM.

Based on a psychometric analysis of the tasks, knowledge, and skills identified by the Role Delineation Study, a practitioner's level of knowledge and application in Project Management can best be assessed by a written examination.

Phase IV: Test Specifications

The final phase of a role delineation study is the development of test specifications that identify the proportion of questions from each domain and task that will appear on the certification examination. Test specifications are developed by combining the overall evaluations of importance, criticality, and frequency, and by converting the results into percentages. These percentages are used to determine the number of questions related to each domain and task that should appear on the multiple-choice format examination.

DOMAIN	TEST BLUEPRINT	
	% of Test	# of Items on Test
I. Initiating the Project	9.3%	14
II. Planning the Project	21.9%	33
III. Executing the Project	27.1%	40
IV. Controlling the Project	21.4%	32
V. Closing the Project	9.0%	14
VI. Professional Responsibility	11.4%	17
Total	100.0%	150

Domains, Tasks, Knowledge and Skill Statements

This section of the report contains the domains, tasks, and knowledge and skill statements, as delineated by the Role Delineation Panel.

Domain I: Initiating the Project

Domain II: Planning the Project

Domain III: Executing the Project

Domain IV: Controlling the Project

Domain V: Closing the Project

Domain VI: Professional Responsibility

Performance Domain I: Initiating the Project

Evaluation and Allocation of Questions for Domain I.

Task	RATINGS					
	Importance	Criticality	Frequency	Sum of Ratings	Percent of Items*	# of Items
1	3.93	3.76	3.31	11.0	12.4%	2
2	4.01	3.91	3.46	11.4	12.9%	2
3	3.77	3.52	3.48	10.8	12.2%	1
4	3.86	3.69	3.44	11.0	12.4%	2
5	3.79	3.66	3.44	10.9	12.3%	2
6	3.69	3.50	3.30	10.5	11.9%	1
7	3.92	3.76	3.43	11.1	12.6%	2
8	4.08	4.00	3.58	11.7	13.2%	2
			Total	88.4		14

* Sum of the Importance, Criticality, and Frequency ratings for a task divided by the sum of the combined rating of all the tasks in the domain.

Tasks and Knowledge and Skill Statements for Domain I

1. Assist in formalizing project goals by working with identified stakeholders to facilitate meeting their requirements, specifications, and/or expectations.

Knowledge of:
a. Effective communication and interviewing techniques
b. Facilitation and analysis techniques
c. Stakeholders
d. Available requirements (input)
e. Available specifications and expectations

Skill in:
a. Interviewing
b. Facilitating (e.g., small meetings, informal sessions, etc.)
c. Communicating effectively (e.g., business and technical language)
d. Gathering, assessing, and integrating information

2. Assist in identifying product or service deliverables, by participating in reviewing or generating the scope of work, requirements, and/or specifications to meet stakeholder expectations.

Knowledge of:
a. Effective communication and interviewing techniques
b. Facilitation and analysis techniques
c. Stakeholders
d. Scope of work
e. Available requirements and specifications
f. Stakeholder expectations

Skill in:
a. Interviewing
b. Facilitating (e.g., small meetings, informal sessions, etc.)
c. Communicating effectively in writing (e.g., business and technical language)
d. Gathering, assessing, and integrating information

3. Suggest project management process outputs by applying designated practices, tools, and methodologies to support required product or service delivery.

Knowledge of:
a. Project management processes, practices, and outputs
b. Project management methodologies and tools
c. Required productlservice delivery

Skill in:
a. Using selected tools
b. Applying appropriate practices and methodologies

4. Assist in documenting project constraints through coordination with stakeholders and review of policies and procedures to ensure compliance.

Knowledge of:
a. Client policies and procedures
b. Effective communication techniques
c. Interview techniques
d. Facilitation and analysis techniques

Skill in:
a. Interviewing
b. Facilitating (e.g., small meetings, informal sessions, etc.)

5. Assist in documenting assumptions by recommending what information should be validated or what situations should be controlled to facilitate the project planning process.

Knowledge of:
a. Effective communication techniques
b. Interview, facilitation, and analysis techniques
c. Negotiation techniques
d. Project planning process
e. Available information

Skill in:
a. Interviewing
b. Facilitating (e.g., small meetings, informal sessions, etc.)
c. Communicating effectively (e.g., business and technical language)
d. Gathering, assessing, and integrating information

6. Suggest performance indicators and limits by referring to productlservice specifications and process standards to support quality management.

Knowledge of:
a. Communication and analysis techniques
b. Project requirements and objectives
c. Stakeholder expectations
d. Interviewing and negotiating techniques
e. Quality assurance standards and techniques
f. Performance criteria
g. Process standards
h. Product/service specifications

Skill in:
a. Applying appropriate practices and methodologies
b. Gathering, assessing, and integrating information
c. Documenting performance indicators and limits

7. Assist in identifying key resource requirements by referring to deliverables to support planning and decision-making.

Knowledge of:
a. Analysis techniques
b. Communication techniques
c. Project requirements and objectives
d. Stakeholder expectations
e. Organizational and other resource tools
f. Project deliverables
g. Funding
h. Estimating techniques
i. Resource skills categories
j. Anticipated project duration

Skill in:
a. Gathering, assessing, and integrating information
b. Communicating effectively (e.g., business and technical language)
c. Estimating resource requirements

8. Assist in defining a project budget and schedule by developing initial time and cost estimates to support development of a baseline.

Knowledge of:
a. Estimating and analysis techniques
b. Budget processes
c. Project deliverables
d. Project requirements and objectives
e. Project funding
f. Stakeholder expectations
g. Scheduling and decision-making techniques

Skill in:
a. Gathering, assessing, and integrating information
b. Communicating effectively (e.g., business and technical language)
c. Developing time and cost estimates
d. Using estimating and scheduling tools

Performance Domain II: Planning the Project

Evaluation and Allocation of Questions for Domain II.

Task	RATINGS					
	Importance	Criticality	Frequency	Sum of Ratings	Percent of Items	# of Items
1	3.97	3.83	3.52	11.3	14.3%	5
2	4.17	3.93	3.60	11.7	14.8%	5
3	3.87	3.68	3.35	10.9	13.8%	4
4	3.87	3.74	3.48	11.1	14.1%	5
5	3.93	3.80	3.45	11.2	14.2%	5
6	4.15	3.92	3.69	11.7	14.8%	5
7	3.90	3.73	3.36	11.0	13.9%	4
			Total	78.9		33

Tasks and Knowledge and Skill Statements for Domain II

1. Assist with refining project requirements, assumptions, and constraints by communicating with stakeholders and reviewing project documents to define the scope of work for the development of the project plan.

Knowledge of:
a. Requirement analysis methods
b. Assumption identification techniques
c. Constraint identification techniques
d. Effective communication techniques
e. Stakeholder identification techniques
f. Existing project documents

Skill in:
a. Identifying legal, organizational, and stakeholder issues
b. Communicating effectively (e.g., business and technical language)
c. Gathering, assessing, and integrating information
d. Planning projects

2. Assist in developing a Work Breakdown Structure (WBS) by applying decomposition techniques to the Scope of Work and other project documents to facilitate detailed project planning.

Knowledge of:
a. WBS development
b. Effective communication techniques
c. Existing project documents

Skill in:
a. Gathering, organizing, and breaking down information into work elements
b. Communicating effectively (e.g., business and technical language)
c. Planning projects

3. Assist in developing the resource management plan by identifying resource requirements necessary to complete project activities.

Knowledge of:
a. Existing project documents
b. Resource estimating techniques
c. Statistical analysis and forecasting techniques
d. Resource availability and selection criterialtechniques
e. Team-building methods and techniques
f. Procurement guidelines and regulations
g. Workload balancing techniques
h. Resource-levelingtechniques
i. Communication techniques

Skill in:
a. Gathering, assessing, and integrating information
b. Communicating effectively (e.g., business and technical language)
c. Negotiating
d. Facilitating team involvement
e. Estimating and forecasting

4. Assist in refining time and cost estimates by applying designated estimating tools and techniques to WBS tasks to define project baseline, schedule, and budget.

Knowledge of:
a. Existing project documents
b. Gathering, assessing, and integrating information
c. Time and cost estimation techniques
d. Statistical analysis and forecasting methods
e. Budgeting techniques
f. Schedule preparation methods
g. Communication techniques

Skill in:
a. Gathering, assessing, and integrating information
b. Communicating effectively (e.g., business and technical language)
c. Negotiating
d. Estimating and forecasting
e. Developing budgets and schedules

5. Assist in establishing project controls by defining processes needed to manage the project and to ensure compliance with legal, organizational, and stakeholder requirements.

Knowledge of:
a. Existing project documents
b. Gathering, assessing, and integrating information
c. Scope and change management concepts
d. Communication management concepts, tools, and techniques
e. Risk management concepts, tools, and techniques
f. Quality management concepts, tools, and techniques
g. Human resource management techniques
h. Team-building methods

Skill in:
a. Communicating effectively (e.g., business and technical language)
b. Negotiating
c. Gathering, assessing, and integrating information
d. Defining processes

6. Assist in developing a project plan by integrating and documenting project deliverables, acceptance criteria, processes, procedures, and tasks to facilitate completion of the project.

Knowledge of:
a. Existing project documents
b. Integrating and sequencing activities/tasks
c. Gantt, PERT, CPM, and PDM techniques
d. Negotiations
e. Risk-analysis and business-writing techniques
f. Industry standards
g. Accepted and/or required control processes, measures, and thresholds
h. Quality control and sampling techniques

Skill in:
a. Gathering, assessing, and integrating information
b. Making decisions
c. Negotiating
d. Writing plans
e. Communicating effectively (e.g., business and technical language)

7. Assist in obtaining project plan approval by preparing documents for reviewing the plan with appropriate stakeholders.

Knowledge of:
a. Existing project documents
b. Required reviewers
c. Approving authorities
d. Effective communication and negotiation techniques
e. Authorization procedures

Skill in:
a. Preparing and presenting information
b. Communicating effectively (e.g., business and technical language)

Performance Domain III: Executing the Project

Evaluation and Allocation of Questions for Domain III.

Task	RATINGS					
	Importance	Criticality	Frequency	Sum of Ratings	Percent of Items	# of Items
1	3.89	3.75	1.97	9.6	17.8%	7
2	3.83	3.72	3.45	11.0	20.4%	8
3	4.21	4.08	3.98	12.3	22.8%	10
4	41 1	3.81	3.00	10.9	20.2%	8
5	3.88	2.73	3.50	10.1	18.7%	7
			Total	53.9		**40**

Tasks and Knowledge and Skill Statements for Domain III

1. Assist in obtaining project resources by using the project plan to ensure all activities can be performed.

Knowledge of:
a. Facilitation techniques
b. Communication and management techniques
c. Contract administration (types, liabilities, terms, and conditions)
d. Budget management techniques
e. Organizational policies and procedures
f. Labor contacts
g. External and internal project environments (legal, cultural, operational, and geographic)
h. Corporate culture and functional business areas
i. Existing project documents

Skill in:
a. Communicating effectively (e.g., business and technical language)
b. Using communication equipment, tools, and programs
c. Coordinating activities and resources
d. Gathering, assessing, presenting, and integrating information
e. Facilitating (e.g., small meetings, informal sessions, etc.)

f. Organizing, developing, and writing reports
g. Negotiating
h. Building, leading, and motivating teams
i. Administering contracts
j. Monitoring and tracking results
k. Resolving conflicts

2. Assist in implementing the project plan by authorizing the execution of assigned activities to produce project deliverables.

Knowledge of:
a. Organization policies and procedures
b. Internal and external project environment
c. Project management methodologies and tools
d. Level of authority
e. Facilitation techniques
f. Management, communication, and negotiation techniques
g. Motivational techniques
h. Existing project documents

Skill in:
a. Assigning work
b. Gathering, assessing, presenting, and integrating information
c. Organizing, developing, and writing reports
d. Negotiating and conflict resolution
e. Building, leading, and motivating teams
f. Administering contracts
g. Monitoring and tracking outputs (results)
h. Communicating effectively (e.g., business and technical language)
i. Coordinating resources
j. Exercising judgment

3. Manage project progress by ensuring that assigned activities are executed as planned to achieve project goals and objectives.

Knowledge of:
a. Organization policies and procedures and labor agreements
b. Internal and external project environment
c. Performance measurement techniques
d. Project management methodologies and tools
e. Level of authority and management leadership principles/techniques
f. Contract administration
g. Communication and negotiation techniques
h. Statistics and reporting (production and requirements)
i. Tracking and monitoring techniques
j. Existing project documents

Skill in:
a. Gathering, assessing, presenting, and integrating information
b. Facilitating (e.g., small meetings, informal sessions, etc.)
c. Organizing, developing, and writing reports
d. Negotiating and resolving conflicts
e. Leading, building, and motivating teams
f. Administering contracts and monitoring/tracking results
g. Coordinating resources
h. Communicating effectively (e.g., business and technical language)
i. Using performance measurement tools

4. Communicate progress of assigned activities by producing reports to provide timely and accurate decision support information to stakeholders.

Knowledge of:
a. Reporting, tracking, and monitoring techniques
b. Media and presentation tools
c. Project methodologies and tools
d. Managementlleadership principles and techniques
e. Reporting (production and requirements)
f. Existing project documents

Skill in:
a. Gathering, assessing, presenting, and integrating information
b. Facilitating (e.g., small meetings, informal sessions, etc.)
c. Organizing, developing, and writing reports
d. Communicating effectively (e.g., business and technical language)
e. Monitoring and tracking results
f. Using reporting tools and techniques

5. Implement quality management for assigned activities by performing project control procedures to achieve project goals and objectives.

Knowledge of:
a. Project controls
b. Quality assurance procedures
c. Presentation and communication techniques
d. Industry product and services standards
e. Existing project documents

Skill in:
a. Gathering, assessing, presenting, and integrating information
b. Facilitating (e.g., small meetings, informal sessions, etc.)
c. Organizing, developing, and writing reports
d. Negotiating and resolving conflicts
e. Administering contracts
f. Monitoring and tracking results
g. Coordinating resources
h. Leading, building, and motivating teams
i. Communicating effectively (e.g., business and technical language)
j. Identifying critical success factors
k. Exercising judgment

Performance Domain IV: Controlling the Project

Evaluation and Allocation of Questions for Domain IV.

Task	RATINGS					
	Importance	Criticality	Frequency	Sum of Ratings	Percent of Items	# of Items
1	3.85	3.63	3.57	11.1	14.7%	5
2	4.11	4.06	3.64	11.8	15.6%	5
3	3.76	3.59	3.36	10.7	14.1%	5
4	4.10	4.01	3.68	11.8	15.6%	5
5	2.74	2.51	3.44	8.7	11.5%	3
6	3.92	3.89	3.36	11.2	14.8%	5
7	3.59	3.39	3.31	10.3	13.6%	4
			Total	75.6		32

Tasks and Knowledge and Skill Statements for Domain IV

1. Evaluate performance of assigned activities by comparing results to the baseline to identify project trends and variances.

Knowledge of:
a. Performance measurement techniques (e.g., PERT, CPM, EVA)
b. Data collection techniques
c. Existing project documents

Skill in:
a. Gathering, assessing, and integrating information
b. Monitoring and tracking results
c. Organizing, developing, and writing reports
d. Using performance measurement tools
e. Communicating effectively (e.g., business and technical language)

2. Implement timely corrective action for assigned activities by addressing identified problem areas to eliminate or minimize negative impact.

Knowledge of:
a. Root cause analysis
b. Corrective actions and their effects on project performance
c. Risk identification and quantification
d. Issues identification and resolution
e. Control limits
f. Trending and forecasting techniques
g. Existing project documents
h. Negotiation techniques

Skill in:
a. Selecting appropriate corrective actions
b. Extrapolating trends to the control limits (e.g., monitoring, forecasting)
c. Exercising judgment
d. Communicating effectively (e.g., business and technical language)

3. Evaluate the effectiveness of corrective actions for assigned activities by measuring subsequent performance to determine the need for further actions.

Knowledge of:
a. Performance measurement techniques (e.g., PERT, CPM, EVA)
b. Data collection techniques
c. Existing project documents

Skill in:
a. Gathering, assessing, and integrating information
b. Monitoring and tracking results
c. Using performance measurement tools

4. Assist in ensuring that project changes follow the change management plan by monitoring and reviewing change initiatives to manage scope.

Knowledge of:
a. Change management plan
b. Change initiatives
c. Work sampling and observations
d. Process standards
e. Existing project documents

Skill in:
a. Gathering, assessing, and integrating information
b. Monitoring and tracking results
c. Exercising judgment
d. Communicating effectively (e.g., business and technical language)

5. Assist in evaluating project control plans by participating in periodic reviews to ensure plans are effective and current.

Knowledge of:
a. Components of the control management plan (communication, risk, etc.)
b. Current situation (stakeholders' reports, meeting, minutes, project diary, and status report)
c. Appropriate review standard and frequency
d. Existing project documents
e. Negotiating techniques

Skill in:
a. Monitoring and tracking results
b. Analyzing variance
c. Exercising judgment
d. Communicating effectively (e.g., business and technical language)
e. Negotiating

6. Respond to risk event triggers for assigned activities in accordance with the risk management plan to properly manage project outcomes.

Knowledge of:
a. Risk management plan
b. Risk event (actual or potential)
c. Existing project documents
d. Risk management process and techniques

Skill in:
a. Exercising judgment
b. Communicating effectively (e.g., business and technical language)
c. Using risk management tools and techniques

7. Evaluate assigned activities by performing periodic inspections to ensure authorized approaches and processes are followed, or to identify the need for corrective action.

Knowledge of:
a. Planned approaches and processes
b. Effectiveness of possible corrective actions
c. Applied approaches and processes
d. Existing project documents

Skill in:
a. Exercising judgment
b. Communicating effectively (e.g., business and technical language)
c. Auditing, monitoring, and tracking results
d. Using inspection techniques
e. Gathering, assessing, and integrating information

Performance Domain V: Closing the Project

Evaluation and Allocation of Questions for Domain V.

Task	RATINGS					
	Importance	Criticality	Frequency	Sum of Ratings	Percent of Items	# of Items
1	4.01	3.79	3.22	11.0	21.8%	3
2	3.79	3.15	3.10	10.0	19.9%	3
3	3.57	3.26	3.09	9.9	19.7%	3
4	3.62	3.25	3.19	10.1	20.1%	3
5	3.40	3.08	2.89	9.37	18.6%	***2***
			Total	50.37		**14**

Tasks and Knowledge and Skill Statements for Domain V

1. Assist in achieving final acceptance of deliverables by obtaining formal approval from appropriate stakeholders to achieve closeout.

Knowledge of:
a. Effectivecommunication techniques
b. Contract management techniques
c. Existing project documents

Skill in:
a. Communicating effectively (e.g., business and technical language)
b. Managing conflicts

2. Assist in documenting lessons learned by surveying project team members and appropriate stakeholders to use for the benefit of future projects.

Knowledge of:
a. Stakeholders
b. Project results
c. Risk mitigation actions and results

Skill in:
a. Gathering, assessing, and integrating information
b. Interviewing
c. Communicating and writing effectively (e.g., business and technical language)

3. Support administrative and financial closure by reviewing documents to identify discrepancies and suggest actions in support of project requirements.

Knowledge of:
a. Closing procedures
b. Finance and law
c. Existing project documents
d. Conflict resolution techniques
e. Contract administration and customer requirements
f. Project contracts

Skill in:
a. Gathering, assessing, and integrating information
b. Communicating effectively (e.g., business and technical language)

4. Assist in preserving project records and required tools by archiving them for future use to adhere to legal and other requirements.

Knowledge of:
a. Organizational records control and maintenance procedures
b. Recordsldocument management and control procedures
c. Intellectual capital management requirements
d. Proprietary information constraints
e. Storage mediums
f. Document production and retrieval requirementslspecifications
g. Existing project documents

Skill in:
a. Gathering, organizing, and documenting information
b. Record keeping

5. Suggest timetable for release of project resources based on organizational procedures to optimize resource utilization.

Knowledge of:
a. Project resources and contracts
b. Organizational procedures and units
c. Communication techniques
d. Resource redeployment plan
e. Resource allocation and control techniques
f. Recognition options (e.g., awards)
g. Existing project documents

Skill in:
a. Gathering, assessing, and managing information
b. Exercising judgment to determine tradeoffs

Performance Domain VI: Professional Responsibility

Evaluation and Allocation of Questions for Domain VI.

Task	RATINGS					
	Importance	Criticality	Frequency	Sum of Ratings	Percent of Items	# of Items
1	4.43	4.26	4.16	12.9	26.4%	5
2	4.15	3.66	3.89	11.3	23.1%	4
3	3.89	3.65	3.45	12.1	24.7%	4
4	4.36	4.07	4.15	12.6	25.7%	4
			Total	48.9	18.6%	17

Tasks and Knowledge and Skill Statements for Domain VI

1. Practice individual integrity and professionalism by adhering to laws, regulations, and ethical standards to protect stakeholders and the wider community.

Knowledge of:
a. Legal requirements
b. Ethical standards
c. Community and stakeholder values

Skill in:
a. Exercising judgment
b. Communicating effectively (e.g., business and technical language)

2. Enhance competence of self and others by increasing, sharing, and applying professional knowledge to improve project management.

Knowledge of:
a. Personal strengths and weaknesses
b. Instructional methods and tools
c. Appropriate professional competencies
d. Personal learning style
e. Training options

Skill in:
a. Communicating effectively (e.g., business and technical language)
b. Exercising judgment
c. Transferring knowledge (coaching, mentoring, training, etc.)
d. Self-assessment
e. Professional development planning
f. Attaining and applying new knowledge and practices

3. Balance stakeholders' interests by suggesting approaches that strive for fair resolution to satisfy competing goals and objectives.

Knowledge of:
a. Stakeholders' interests
b. Competing needs and objectives
c. Conflict resolution

Skill in:
a. Exercising judgment
b. Generating alternatives
c. Negotiating
d. Communicating effectively (e.g., business and technical language)
e. Gathering, assessing, and integrating information
f. Resolving conflicts

4. Interact with team and stakeholders in a professional and cooperative manner by respecting personal, ethnic, and cultural differences to ensure a collaborative project management environment.

Knowledge of:
a. Standards for professional communication
b. Ethnic and cultural norms of team members and stakeholders
c. Stakeholder and team members' communication preferences

Skill in:
a. Communicating effectively (e.g., business and technical language)
b. Embracing diversity
c. Exercising tolerance, self-control, and compromise
d. Using interpersonal skills

Glossary of Terms

Content Validation: A special form of validation. The process by which a certification examination is determined to reflect what professionals actually do on the job.

Criticality: A rating that is used in the validation of a domain or task. Criticality is defined as the degree to which lack of knowledge or skills in a domain or task could lead to adverse consequences.

Frequency: A rating that is used in the validation of a domain or task. For the *PMI Role Delineation Study,* frequency was defined as the percent of projects on which Certified Associates in Project Management would perform duties associated with each domain or task.

Importance: A rating that is used in the validation of a domain or task. Importance is defined as the degree to which a particular task or domain is essential to the job performance of a professional in the particular field being examined.

Performance Domains: The major content areas of a profession, as defined by the technical advisers to a role delineation study.

Role Delineation Study: A process that defines the responsibilities of a particular profession. A role delineation typically consists of two phases: one in which technical advisers define the responsibilities of the particular profession, and another in which individuals working in the profession validate the responsibilities identified by the technical advisers. The second phase is typically accomplished through use of a survey.

Tasks: Specific actions that are performed by professionals in a particular field. A role delineation study should define all the relevant tasks that a professional might be expected to perform in fulfillment of his or her duties.

Technical Advisers: Experts in the field who are involved in the definition of the domains, tasks, and knowledge and skill statements of the particular profession, as outlined in the *Role Delineation Study.*

Test Specifications: Also called test blueprints. Test specifications identify the proportion of questions from each domain and task that will appear on the certification examination. Test specifications are developed by combining the overall evaluations of importance, criticality, and frequency and converting the results into percentages.

Validation: The process by which a certification examination is determined to measure what it has been designed to measure. In other words, does the certification examination perform as designed (i.e., distinguish between those candidates who have an acceptable level of knowledge and application and those candidates who do not)?