JTA

informs JOB TASK ANALYSIS

THE JOB TASK ANALYSIS EXPLAINED

PRACTICE ANALYSIS 2019

This document represents a delineation of common or typical tasks (T) performed and knowledge (K) applied by Analytics Professionals. In the course of analytics work, these tasks may be performed multiple times with modifications made based on data, findings, and results as part of ongoing feedback loops. (For clarity and simplicity, most of the feedback loops are not presented in this document. It is assumed and understood that they are a routine part of practice.)

DEFINITION AND DEVELOPMENT

The Job Task Analysis (JTA) study defines the current knowledge, skills, and abilities (KSAs) that must be demonstrated by analytics professionals to effectively and successfully provide these services. KSAs are validated according to their frequency of use and importance. The JTA also serves as a "blueprint" for the content (performance domains) of the INFORMS CAP® examination.

INFORMS upholds stringent guidelines for the construction and implementation of the examination development and administration process. A panel of subject matter experts (SMEs) was selected to develop the JTA for the CAP credential.

VALIDATION

The findings of this working group were then validated by a random sample of practicing analytics professionals. Feedback from this survey resulted in slight modifications of the performance domains, tasks, and knowledge that comprise the test blueprint that determines the content of the CAP examination.

The table below includes the final domains and their representation on the certification exam that were derived from the JTA and a review of validation survey recommendations.

EXAM BLUEPRINT

Domain	Examination Weight[1]
I. Business Problem (Question) Framing	14%
II. Analytics Problem Framing	17%
III. Data	23%
IV. Methodology (Approach) Selection	14%
V. Model Building	16%
VI. Deployment	10%
VII. Model Lifecycle Management	6%

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DOMAIN I: BUSINESS PROBLEM FRAMING

The Business Problem Framing domain includes activities related to understanding the business problem and evaluating the scope of the problem.

TASKS: BUSINESS PROBLEM (QUESTION) FRAMING (14%)[1]

The necessary knowledge to successfully perform each task is listed below each task statement.

Task 1: Identify initial problem statement and desired outcomes.

- K-1: Characteristics of a business problem statement (i.e., a clear and concise statement of the problem describing the situation and stating the desired end state or goal)
- K-2: Interviewing (questioning) techniques (i.e., the process by which a practitioner elicits information and understanding from business experts including strategies for the success of the project)
- K-3: Business processes and terminology used by the client or project sponsor that are related to the problem
- K-4: Client and client-related organizational structures

Task 2: Identify all stakeholders and their perspectives.

- K-2: Interviewing (questioning) techniques (i.e., the process by which a practitioner elicits information and understanding from business experts including strategies for the success of the project)
- K-3: Business processes and terminology used by the client or project sponsor that are related to the problem
- K-4: Client and client-related organizational structures

Task 3: Determine if the problem can be effectively addressed by analytics.

- K-3: Business processes and terminology used by the client or project sponsor that are related to the problem
- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)

Task 4: Refine the initial problem statement and identify business constraints.

- K-1: Characteristics of a business problem statement (i.e., a clear and concise statement of the problem describing the situation and stating the desired end state or goal)
- K-2: Interviewing (questioning) techniques (i.e., the process by which a practitioner elicits information and understanding from business experts including strategies for the success of the project)

- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)

Task 5: Define an Initial Set of Business Costs and Benefits

- K-2: Interviewing (questioning) techniques (i.e., the process by which a practitioner elicits information and understanding from business experts including strategies for the success of the project)
- K-3: Business processes and terminology used by the client or project sponsor that are related to the problem
- K-4: Client and client-related organizational structures
- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)
- K-7: Performance measurement (i.e., the technical and business metrics by which the client and analyst measure the success of the project)
- K-8: Risk/return (i.e., trade-offs between prioritizing the primary objective and minimizing the likelihood of significant penalty taking into account the risk attitude of the decision-maker)

Task 6: Obtain Stakeholder Agreement on the Business Problem Framing

- K-1: Characteristics of a business problem statement (i.e., a clear and concise statement of the problem describing the situation and stating the desired end state or goal)
- K-2: Interviewing (questioning) techniques (i.e., the process by which a practitioner elicits information and understanding from business experts including strategies for the success of the project)
- K-3: Business processes and terminology used by the client or project sponsor that are related to the problem
- K-4: Client and client-related organizational structures
- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)
- K-7: Performance measurement (i.e., the technical and business metrics by which the client and analyst measure the success of the project)
- K-8: Risk/return (i.e., trade-offs between prioritizing the primary objective and minimizing the likelihood of significant penalty taking into account the risk attitude of the decision-maker)
- K-9: Presentation techniques (i.e., strategies for communicating analytics problems and solutions to a broad audience of business clients)

DOMAIN II: ANALYTICS PROBLEM FRAMING

The Analytics Problem Framing domain includes activities related to understanding & framing the business problem as an analytics problem to develop the optimal solution.

TASKS: ANALYTICS PROBLEM FRAMING (17%)[1]

The necessary knowledge to successfully perform each task is listed below each task statement.

Task 1: Reformulate the Business Problem Statement as an Analytics Problem

- K-3: Business processes and terminology used by the client or project sponsor that are related to the problem
- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, tatistical analysis, data mining, machine learning, etc.)
- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)

Task 2: Develop a Proposed Set of Drivers and Relationships to Outputs

- K-3 Business processes and terminology used by the client or project sponsor that are related to the problem
- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-7: Performance measurement (i.e., the technical and business metrics by which the client and analyst measure the success of the project)
- K-8: Risk/return (i.e., trade-offs between prioritizing the primary objective and minimizing the likelihood of significant penalty taking into account the risk attitude of the decision-maker)
- K-10: Structure of decisions (e.g., influence diagrams, decision trees, system structures)

Task 3: State the Set of Assumptions Related to the Problem

- K-3: Business processes and terminology used by the client or project sponsor that are related to the problem
- K-4: Client and client-related organizational structures
- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)
- K-8: Risk/return (i.e., trade-offs between prioritizing the primary objective & minimizing the likelihood of significant penalty taking into account the risk attitude of the decision-maker)

- K-12: Data rules (e.g., privacy, intellectual property, security, governance, copyright, sharing)

Task 4: Define Key Metrics of Success

- K-1: Characteristics of a business problem statement (i.e., a clear and concise statement of the problem describing the situation and stating the desired end state or goal)
- K-3: Business processes and terminology used by the client or project sponsor that are related to the problem
- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-7: Performance measurement (i.e., the technical and business metrics by which the client and analyst measure the success of the project)
- K-8: Risk/return (i.e., trade-offs between prioritizing the primary objective and minimizing the likelihood of significant penalty taking into account the risk attitude of the decision-maker)

Task 5: Obtain Stakeholder Agreement on the Analytics Problem Framing

- K-1: Characteristics of a business problem statement (i.e., a clear and concise statement of the problem describing the situation and stating the desired end state or goal)
- K-2: Interviewing (questioning) techniques (i.e., the process by which a practitioner elicits information and understanding from business experts including strategies for the success of the project)
- K-3: Business processes and terminology used by the client or project sponsor that are related to the problem
- K-4: Client and client-related organizational structures
- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)
- K-7: Performance measurement (i.e., the technical and business metrics by which the client and analyst measure the success of the project)
- K-8: Risk/return (i.e., trade-offs between prioritizing the primary objective and minimizing the likelihood of significant penalty taking into account the risk attitude of the decision-maker)
- K-9: Presentation techniques (i.e., strategies for communicating analytics problems and solutions to a broad audience of business clients)
- K-10: Structure of decisions (e.g., influence diagrams, decision trees, system structures)
- K-11: Negotiation techniques (i.e., strategies and methods that allow the analytics professional to reach a shared understanding with the client)
- K-12: Data rules (e.g., privacy, intellectual property, security, governance, copyright, sharing)

DOMAIN III: DATA

The Data domain includes activities related to identifying what data are needed, what data are available, manipulating data so as to render it usable to find the answer to an analytics problem, and includes the documentation and reporting needed.

TASKS: DATA (23%)[1]

The necessary knowledge to successfully perform each task is listed below each task statement.

Task 1: Identify and Prioritize Data Needs and Sources

- K-2: Interviewing (questioning) techniques (i.e., the process by which a practitioner elicits information and understanding from business experts including strategies for the success of the project)
- K-3: Business processes and terminology used by the client or project sponsor that are related to the problem
- K-4: Client and client-related organizational structures
- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)
- K-10: Structure of decisions (e.g., influence diagrams, decision trees, system structures)
- K-11: Negotiation techniques (i.e., strategies and methods that allow the analytics professional to reach a shared understanding with the client)
- K-12: Data rules (e.g., privacy, intellectual property, security, governance, copyright, sharing)
- K-13: Data design and architecture (i.e., a description of how data is processed, stored, and used in organizational systems including conceptual, logical, and physical)

Task 2: Acquire Data

- K-2: Interviewing (questioning) techniques (i.e., the process by which a practitioner elicits information and understanding from business experts including strategies for the success of the project)
- K-4: Client and client-related organizational structures
- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to he problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)
- K-10: Structure of decisions (e.g., influence diagrams, decision trees, system structures)

- K-11: Negotiation techniques (i.e., strategies and methods that allow the analytics professional to reach a shared understanding with the client)
- K-12: Data rules (e.g., privacy, intellectual property, security, governance, copyright, sharing)
- K-13: Data design and architecture (i.e., a description of how data is processed, stored, and used in organizational systems including conceptual, logical and physical aspects)
- K-14: Data extraction technologies (e.g., scripting, spreadsheets/databases, connection tools, standards-based connectivity options, unstructured data extraction tools)

Task 3: Clean, Transform, and Validate the Data

- K-5: Modeling options (i.e., the analytic approaches available for seeking a solutionto the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-12: Data rules (e.g., privacy, intellectual property, security, governance, copyright, sharing)
- K-13: Data design and architecture (i.e., a description of how data is processed, stored, and used in organizational systems including conceptual, logical and physical aspects)
- K-14: Data extraction technologies (e.g., scripting, spreadsheets/databases, connection tools, standards-based connectivity options, unstructured data extraction tools)
- K-15: Visualization techniques (i.e., any technique for creating images, diagrams, or animations to communicate a message including data visualization, information visualization, statistical graphics, presentation graphics, etc.)
- K-16: Statistics (descriptive, correlation, regression, etc.)

Task 4: Identify Relationships in the Data

- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-12: Data rules (e.g., privacy, intellectual property, security, governance, copyright, sharing)
- K-13: Data design and architecture (i.e., a description of how data is processed, stored and used in organizational systems including conceptual, logical and physical aspects)
- K-15: Visualization techniques (i.e., any technique for creating images, diagrams, or animations to communicate a message including data visualization, information visualization, statistical graphics, presentation graphics, etc.)
- K-16: Statistics (descriptive, correlation, regression, etc.)

Task 5: Document and Preliminary Report Findings (e.g., Insights, Results, Business Performance)

- K-4: Client and client-related organizational structures
- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)

- K-7: Performance measurement (i.e., the technical and business metrics by which the client and analyst measure the success of the project)
- K-8: Risk/return (i.e., trade-offs between prioritizing the primary objective and minimizing the likelihood of significant penalty taking into account the risk attitude of the decision-maker)
- K-9: Presentation techniques (i.e., strategies for communicating analytics problems and solutions to a broad audience of business clients)
- K-12: Data rules (e.g., privacy, intellectual property, security, governance, copyright, sharing)
- K-15: Visualization techniques (i.e., any technique for creating images, diagrams, or animations to communicate a message including data visualization, information visualization, statistical graphics, presentation graphics, etc.)
- K-16: Statistics (descriptive, correlation, regression, etc.

Task 6: Refine the Business and Analytics Problem Statements

- K-2: Interviewing (questioning) techniques (i.e., the process by which a practitioner elicits information and understanding from business experts including strategies for the success of the project)
- K-3: Business processes and terminology used by the client or project sponsor that are related to the problem
- K-4: Client and client-related organizational structures
- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)
- K-10: Structure of decisions (e.g., influence diagrams, decision trees, system structures)

DOMAIN IV: METHODOLOGY (APPROACH) SELECTION

The Methodology (Approach) Selection domain includes activities related to selecting the software and tools that will enable analytics problem solutions.

TASKS: METHODOLOGY (APPROACH) SELECTION (14%)[1]

The necessary knowledge to successfully perform each task is listed below each task statement.

Task 1: Identify Available Problem Solving Methodologies (Approaches)

- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)
- K-13: Data design and architecture (i.e., a description of how data is processed, stored, and used in organizational systems including conceptual, logical and physical aspects)
- K-15: Visualization techniques (i.e., any technique for creating images, diagrams or animations to communicate a message including data visualization, information visualization, statistical graphics, presentation graphics, etc.)
- K-16: Statistics (descriptive, correlation, regression, etc.)

Task 2: Select Software Tools

- K-17: Software tools

Task 3: Evaluate Methodologies (Approaches)[2]

Task 4: Select Methodologies (Approaches)[2]

DOMAIN V: MODEL BUILDING

The Model Building domain includes activities related to identifying, using, calibrating, and integrating models as well as the documentation of the model and communication of findings.

TASKS: MODEL BUILDING (16%)[1]

The necessary knowledge to successfully perform each task is listed below each task statement.

Task 1: Specify Conceptual Models

- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)[2]
- K-8: Risk/return (i.e., trade-offs between prioritizing the primary objective and minimizing the likelihood of significant penalty taking into account the risk attitude of the decision-maker)
- K-10: Structure of decisions (e.g., influence diagrams, decision trees, system structures)
- K-13: Data design and architecture (i.e., a description of how data is processed stored, and used in organizational systems including conceptual, logical and physical aspects)
- K-15: Visualization techniques (i.e., any technique for creating images, diagrams or animations to communicate a message including data visualization, information visualization, statistical graphics, presentation graphics, etc.)
- K-16: Statistics (descriptive, correlation, regression, etc.)

Task1a: Build and Verify the Models[2]

Task 2: Run and Evaluate the Models

- K-3: Business processes and terminology used by the client or project sponsor that are related to the problem
- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)
- K-7: Performance measurement (i.e., the technical and business metrics by which the client and analyst measure the success of the project)
- K-12: Data rules (e.g., privacy, intellectual property, security, governance, copyright, sharing)
- K-13: Data design and architecture (i.e., a description of how data is processed, stored, and used in organizational systems including conceptual, logical and physical aspects)

- K-16: Statistics (descriptive, correlation, regression, etc.)

Task 3: Calibrate Models and Data[2]

Task 4: Integrate the Models[2]

Task 5: Document and Communicate Findings (Assumptions, Limitations, and Constraints)

- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)
- K-7: Performance measurement (i.e., the technical and business metrics by which the client and analyst measure the success of the project)
- K-8: Risk/return (i.e., trade-offs between prioritizing the primary objective and minimizing the likelihood of significant penalty taking into account the risk attitude of the decision-maker)
- K-9: Presentation techniques (i.e., strategies for communicating analytics problems and solutions to a broad audience of business clients)
- K-10: Structure of decisions (e.g., influence diagrams, decision trees, system structures)
- K-12: Data rules (e.g., privacy, intellectual property, security, governance, copyright, sharing)
- K-15: Visualization techniques (i.e., any technique for creating images, diagrams, or animations to communicate a message including data visualization, information visualization, statistical graphics, presentation graphics, etc.)

DOMAIN VI: DEPLOYMENT

The Deployment domain includes activities related to the delivery of the model and requirements to support the deployment.

TASKS: DEPLOYMENT (10%)[1]

The necessary knowledge to successfully perform each task is listed below each task statement.

Task 1: Perform Business Validation of the Model

- K-2: Interviewing (questioning) techniques (i.e., the process by which a practitioner elicits information and understanding from business experts including strategies for the success of the project)
- K-3: Business processes and terminology used by the client or project sponsor that are related to the problem
- K-4: Client and client-related organizational structures
- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-7: Performance measurement (i.e., the technical and business metrics by which the client and analyst measure the success of the project)
- K-8: Risk/return (i.e., trade-offs between prioritizing the primary objective and minimizing the likelihood of significant penalty taking into account the risk attitude of the decision-maker)
- K-9: Presentation techniques (i.e., strategies for communicating analytics problems and solutions to a broad audience of business clients)

Task 2: Deliver Report with Findings; and/or

Task 3: Create Model, Usability, and System Requirements for Production

- K-2: Interviewing (questioning) techniques (i.e., the process by which a practitioner elicits information and understanding from business experts including strategies for the success of the project)
- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-7: Performance measurement (i.e., the technical and business metrics by which the client and analyst measure the success of the project)
- K-8: Risk/return (i.e., trade-offs between prioritizing the primary objective and minimizing the likelihood of significant penalty taking into account the risk attitude of the decision-maker)
- K-9: Presentation techniques (i.e., strategies for communicating analytics problems and solutions to a broad audience of business clients)

- K-11: Negotiation techniques (i.e., strategies and methods that allow the analytics professional to reach a shared understanding with the client)
- K-12: Data rules (e.g., privacy, intellectual property, security, governance, copyright, sharing)
- K-13: Data design and architecture (i.e., a description of how data is processed, stored, nd used in organizational systems including conceptual, logical and physical aspects)
- K-15: Visualization techniques (i.e., any technique for creating images, diagrams, or animations to communicate a message including data visualization, information visualization, statistical graphics, presentation graphics, etc.)

Task 4: Deliver Production Model/System[2]

Task 5: Support Deployment

- K-2: Interviewing (questioning) techniques (i.e., the process by which a practitioner elicits information and understanding from business experts including strategies for the success of the project)
- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)
- K-9: Presentation techniques (i.e., strategies for communicating analytics problems and solutions to a broad audience of business clients)
- K-11: Negotiation techniques (i.e., strategies and methods that allow the analytics professional to reach a shared understanding with the client)
- K-12: Data rules (e.g., privacy, intellectual property, security, governance, copyright, sharing)
- K-13: Data design and architecture (i.e., a description of how data is processed, stored, and used in organizational systems including conceptual, logical and physical aspects)

DOMAIN VII: MODEL LIFECYCLE MANAGEMENT

The Model Lifecycle Management domain includes activities related to continual oversight and calibration and training activities to ensure the model continues to function as planned and return valid answers. Note that real-time calibration of a model will not be required at this level.

TASKS: MODEL LIFECYCLE MANAGEMENT (6%)[1]

The necessary knowledge to successfully perform each task is listed below each task statement.

Task 1: Create Documentation

- K-2: Interviewing (questioning) techniques (i.e., the process by which a practitioner elicits information and understanding from business experts including strategies for the success of the project)
- K-9: Presentation techniques (i.e., strategies for communicating analytics problems and solutions to a broad audience of business clients)
- K-15: Visualization techniques (i.e., any technique for creating images, diagrams, or animations to communicate a message including data visualization, information visualization, statistical graphics, presentation graphics, etc.)

Task 2: Track Model Performance

- K-2: Interviewing (questioning) techniques (i.e., the process by which a practitioner elicits information and understanding from business experts including strategies for the success of the project)
- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-7: Performance measurement (i.e., the technical and business metrics by which the client and analyst measure the success of the project)
- K-8: Risk/return (i.e., trade-offs between prioritizing the primary objective and minimizing the likelihood of significant penalty taking into account the risk attitude of the decision-maker)
- K-12: Data rules (e.g., privacy, intellectual property, security, governance, copyright, sharing)
- K-13: Data design and architecture (i.e., a description of how data is processed, stored, and used in organizational systems including conceptual, logical and physical aspects)
- K-15: Visualization techniques (i.e., any technique for creating images, diagrams or animations to communicate a message including data visualization, information visualization, statistical graphics, presentation graphics, etc.)
- K-16: Statistics (descriptive, correlation, regression, etc.)

Task 3: Recalibrate and Maintain the Model[2]

Task 4: Support Training Activities

- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)
- K-7: Performance measurement (i.e., the technical and business metrics by which the client and analyst measure the success of the project)
- K-8: Risk/return (i.e., trade-offs between prioritizing the primary objective and minimizing the likelihood of significant penalty taking into account the risk attitude of the decision-maker)
- K-9: Presentation techniques (i.e., strategies for communicating analytics problems and solutions to a broad audience of business clients)
- K-12: Data rules (e.g., privacy, intellectual property, security, governance, copyright, sharing)
- K-15: Visualization techniques (i.e., any technique for creating images, diagrams, or animations to communicate a message including data visualization, information visualization, statistical graphics, presentation graphics, etc.)

Task 5: Evaluate the Business Costs and Benefits of the Model Over Time

- K-2: Interviewing (questioning) techniques (i.e., the process by which a practitioner elicits information and understanding from business experts including strategies for the success of the project)
- K-3: Business processes and terminology used by the client or project sponsor that are related to the problem
- K-4: Client and client-related organizational structures
- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)
- K-7: Performance measurement (i.e., the technical and business metrics by which the client and analyst measure the success of the project)
- K-8: Risk/return (i.e., trade-offs between prioritizing the primary objective and minimizing the likelihood of significant penalty taking into account the risk attitude of the decision-maker)
- K-9: Presentation techniques (i.e., strategies for communicating analytics problems and solutions to a broad audience of business clients)
- K-12: Data rules (e.g., privacy, intellectual property, security, governance, copyright, sharing)
- K-15: Visualization techniques (i.e., any technique for creating images, diagrams, or animations to communicate a message including data visualization, information visualization, statistical graphics, presentation graphics, etc.)

KNOWLEDGE & SKILLS STATEMENTS

Successful performance of the tasks listed herein requires specific knowledge, which is what will be tested. The knowledge and skills statements are as follows:

- K-1: Characteristics of a business problem statement (i.e., a clear and concise statement of the problem describing the situation and stating the desired end state or goal)
- K-2: Interviewing (questioning) techniques (i.e., the process by which a practitioner elicits information and understanding from business experts including strategies for the success of the project)
- K-3: Business processes and terminology used by the client or project sponsor that are related to the problem
- K-4: Client and client-related organizational structures
- K-5: Modeling options (i.e., the analytic approaches available for seeking a solution to the problem or answer to the question including optimization, simulation, forecasting, statistical analysis, data mining, machine learning, etc.)
- K-6: Resources necessary for analytics solutions (e.g., human, data, computing, software)
- K-7: Performance measurement (i.e., the technical and business metrics by which the client and analyst measure the success of the project)
- K-8: Risk/return (i.e., trade-offs between prioritizing the primary objective and minimizing the likelihood of significant penalty taking into account the risk attitude of the decision-maker)
- K-9: Presentation techniques (i.e., strategies for communicating analytics problems and solutions to a broad audience of business clients)
- K-10: Structure of decisions (e.g., influence diagrams, decision trees, system structures)
- K-11: Negotiation techniques (i.e., strategies and methods that allow the analytics professional to reach a shared understanding with the client)
- K-12: Data rules (e.g., privacy, intellectual property, security, governance, copyright, sharing)
- K-13: Data design and architecture (i.e., a description of how data is processed, stored, and used in organizational systems including conceptual, logical, and physical aspects)
- K-14: Data extraction technologies (e.g., scripting, spreadsheets/databases, connection tools, standards-based connectivity options, unstructured data extraction tools)
- K-15: Visualization techniques (i.e., any technique for creating images, diagrams, or animations to communicate a message including data visualization, information visualization, statistical graphics, presentation graphics, etc.)
- K-16: Statistics (descriptive, correlation, regression, etc.)
- K-17: Software tools

[1] The domain weights shown are based on expert assessments of the importance of tasks and the frequency of their performance. Those weights influence the exam blueprint or the percentage of the exam devoted to each domain.

[2] Tasks performed by analytics professionals beyond certification level; these tasks are not tested in the CAP exam but professionals will be expected to have this knowledge as they progress in their careers.