ANALYTICS JOB TASK ANALYSIS

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.)

(15%) Domain I Business Problem (Question) Framing

T-1 Obtain or receive problem statement and usability requirements

The successful performance of this task requires knowledge of:

- 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 Client business processes (i.e., the processes 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.)

T-2 Identify stakeholders

The successful performance of this task requires knowledge of:

- 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

T-3 Determine if the problem is amenable to an analytics solution

The successful performance of this task requires knowledge of:

- K-3 Client business processes (i.e., the processes 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.)

T-4 Refine the problem statement and delineate constraints

The successful performance of this task requires knowledge of:

- 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)

T-5 Define an initial set of business benefits

The successful performance of this task requires knowledge of:

- 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 Client business processes (i.e., the processes 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 the analyst measure the success of the project)
K-8 Modeling of uncertainty including risk/return (i.e., trade-offs among stakeholder objectives taking into account the risk attitudes and value preferences of the decision makers)

T-6 Obtain stakeholder agreement on the problem statement

The successful performance of this task requires knowledge of:

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-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 the 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)

(17%) Domain II Analytics Problem Framing

T-1 Reformulate the problem statement as an analytics problem

The successful performance of this task requires knowledge of:

K-3 Client business processes (i.e., the processes 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)

T-2 Develop a proposed set of drivers and relationships to outputs

The successful performance of this task requires knowledge of:

- K-3 Client business processes (i.e., the processes 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 the analyst measure the success of the project)
- K-8 Modeling of uncertainty including risk/return (i.e., trade-offs among stakeholder objectives taking into account the risk attitudes and value preferences of the decision makers)
- K-10 Structure of decisions (e.g., influence diagrams, decision trees, system structures)

T-3 State the set of assumptions related to the problem

The successful performance of this task requires knowledge of:

- 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 Modeling of uncertainty including risk/return (i.e., trade-offs among stakeholder objectives taking into account the risk attitudes and value preferences of the decision makers)

T-4 Define key metrics of success

The successful performance of this task requires knowledge of:

- 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 Client business processes (i.e., the processes 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 the analyst measure the success of the project)
K-8 Modeling of uncertainty including risk/return (i.e., trade-offs among stakeholder objectives taking into account the risk attitudes and value preferences of the decision makers)

T-5 Obtain stakeholder agreement

The successful performance of this task requires knowledge of:

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-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 the analyst measure the success of the project)
K-8 Modeling of uncertainty including risk/return (i.e., trade-offs among stakeholder objectives taking into account the risk attitudes and value preferences of the decision makers)
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)

(22%) Domain III Data

T-1 Identify and prioritize data needs and sources

The successful performance of this task requires knowledge of:

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 Client business processes (i.e., the processes 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 architecture (i.e., a description of how data is processed, stored and used in organizational systems including conceptual, logical and physical aspects)

T-2 Acquire data

The successful performance of this task requires knowledge of:

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 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-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 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)

T-3 Harmonize, rescale, clean and share data

The successful performance of this task requires knowledge of:

- 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 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.)

T-4 Identify relationships in the data

The successful performance of this task requires knowledge of:

- 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-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.)

T-5 Document and report findings (e.g., insights, results, business performance)

The successful performance of this task requires knowledge of:

- 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 the analyst measure the success of the project)

K-8 Modeling of uncertainty including risk/return (i.e., trade-offs among stakeholder objectives taking into account the risk attitudes and value preferences of the decision makers)
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.)

T-6 Refine the business and analytics problem statements

The successful performance of this task requires knowledge of:

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 Client business processes (i.e., the processes 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)

(15%) Domain IV Methodology (Approach) Selection

T-1 Identify available problem solving approaches (methods)

The successful performance of this task requires knowledge of:

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-13 Data architecture (i.e., a description of how data is processed, stored and used in organizational systems including conceptual, logical and physical aspects)

T-2 Select software tools

The successful performance of this task requires knowledge of:

K-17 Software tools

T-3 Test approaches (methods)[1]

T-4 Select approaches (methods) [1]

(16%) Domain V Model Building

T-1 Identify model structures[1]

T-2 Run and evaluate the models

The successful performance of this task requires knowledge of:

K-3 Client business processes (i.e., the processes 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 the analyst measure the success of the project)
K-12 Data rules (e.g., privacy, intellectual property, security, governance, copyright, sharing)
K-16 Statistics (descriptive, correlation, regression, etc.)

T-3 Calibrate models and data[1]

T-4 Integrate the models[1]

[1] Tasks performed by analytics professionals beyond certification level

T-5 Document and communicate findings (including assumptions, limitations and constraints)

The successful performance of this task requires knowledge of:

- 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 the analyst measure the success of the project)
- K-8 Modeling of uncertainty including risk/return (i.e., trade-offs among stakeholder objectives taking into account the risk attitudes and value preferences of the decision makers)
- 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.)

(9%) Domain VI Deployment

T-1 Perform business validation of the model

The successful performance of this task requires knowledge of:

- 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 Client business processes (i.e., the processes 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 the analyst measure the success of the project)
- K-8 Modeling of uncertainty including risk/return (i.e., trade-offs among stakeholder objectives taking into account the risk attitudes and value preferences of the decision makers)

K-9 Presentation techniques (i.e., strategies for communicating analytics problems and solutions to a broad audience of business clients)

T-2 Deliver report with findings; or
T-3 Create model, usability and system requirements for production

The successful performance of these tasks requires knowledge of:

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 the analyst measure the success of the project)
K-8 Modeling of uncertainty including risk/return (i.e., trade-offs among stakeholder objectives taking into account the risk attitudes and value preferences of the decision makers)
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 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.)

T-4 Deliver production model/system[1]

T-5 Support deployment

The successful performance of this task requires knowledge of:

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)

[1] Tasks performed by analytics professionals beyond certification level

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-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 architecture (i.e., a description of how data is processed, stored and used in organizational systems including conceptual, logical and physical aspects)

(6%) Domain VII Model Lifecycle Management

T-1 Document initial structure

The successful performance of this task requires knowledge of:

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 the analyst measure the success of the project)
K-8 Modeling of uncertainty including risk/return (i.e., trade-offs among stakeholder objectives taking into account the risk attitudes and value preferences of the decision makers)
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.)

T-2 Track model quality

The successful performance of this task requires knowledge of:

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 the analyst measure the success of the project)

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

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

T-3 Recalibrate and maintain the model[1]

T-4 Support training activities

The successful performance of this task requires knowledge of:

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 the analyst measure the success of the project)

K-8 Modeling of uncertainty including risk/return (i.e., trade-offs among stakeholder objectives taking into account the risk attitudes and value preferences of the decision makers)

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.)

T-5 Evaluate the business benefit 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 Client business processes (i.e., the processes used by the client or project sponsor that are related to the problem)

K-4 Client and client-related organizational structures

[1] Tasks performed by analytics professionals beyond certification level

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 the analyst measure the success of the project)

K-8 Modeling of uncertainty including risk/return (i.e., trade-offs among stakeholder objectives taking into account the risk attitudes and value preferences of the decision makers)

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.)