INFORMS ANALYTICS FRAMEWORK

The INFORMS Analytics Framework details specific analytics roles, responsibilities and tasks essential for successfully applying analytics to problems, questions, and opportunities enabling impactful business, research, medical, and other decisions. Developed by INFORMS with input from the analytics community, the framework establishes best practices for analytics success.

Domain I: Business Problem (Question) Framing

Analytics methodologies are applied to problems, which are sometimes stated as questions. The **Business Problem (Question) Framing** domain includes activities related to understanding the business problem and relevant questions, as well as evaluating the scope of the problem. The activity may also include the identification of opportunities, challenges, or just an evaluation if a question is well defined. This framing process is essential for ensuring that a clear, actionable problem is defined before seeking solutions. Tasks in this domain include determining, refining and clarifying a business problem statement, identifying stakeholders and aligning the stakeholders with the stated business problem statement, and determining whether the problem is amenable to an analytics solution. With agreement on a business problem statement and appropriate sponsor agreement to move forward with a solution, the remaining domains of the INFORMS Analytics Framework are now applicable.

- Task 1.1 Develop an initial statement of a business problem (question).
- Task 1.2 Identify all stakeholders and their perspectives.
- Task 1.3 Determine if the business problem (question) is amenable to an analytics solution.
- Task 1.4 Refine the initial business problem (question) statement until it is clear and concise.
- Task 1.5 Create an initial business case for a solution to the business problem (question).
- Task 1.6 Obtain sponsor agreement and stakeholder alignment on the business problem (question) statement.

Domain II: Analytics Problem Framing

The **Analytics Problem Framing** domain focuses on translating a clearly defined business problem (question) into a structured analytics problem that can be addressed with analytics techniques applied to data. This process ensures that analytical efforts are aligned with business objectives and that outcomes will be relevant and actionable. A significant activity in this domain is reformulating the business question into an analytics problem, requiring the application of descriptive, predictive or prescriptive analytics. This translation helps define the type of analytics or model needed.

Another activity is identifying the critical drivers or inputs and determining how they relate to desired outputs, forming the basis for hypothesis testing or model design. To ensure relevance and effectiveness, the domain includes defining primary success measures, such as accuracy, revenue lift, or operational efficiency gains. Risk identification and mitigation strategies are also important to anticipate challenges such as data limitations or unintended bias. This domain emphasizes the need for sponsor agreement and stakeholder alignment to ensure buy-in and shared understanding before moving forward with analytics solution development.

By clearly framing the analytics problem, organizations can reduce ambiguity, align technical efforts with strategic goals, and set a solid foundation for model development and implementation.

- Task 2.1 Reformulate the statement of the business problem (question) as an analytics problem statement.
- Task 2.2 Develop a proposed set of drivers/inputs and determine how they relate to outputs.
- Task 2.3 State the set of assumptions related to the analytics problem.
- Task 2.4 Define primary measures of success.
- Task 2.5 Identify baseline performance of the current state.
- Task 2.6 Identify risks and mitigation strategies for an effective potential analytics solution implementation.
- Task 2.7 Obtain sponsor agreement and stakeholder alignment on the Analytics Problem Framing.

Domain III: Data

The **Data** domain encompasses activities related to identifying the data required and available, ensuring its usability for solving analytics problems, and fulfilling documentation and reporting needs. It also includes the effective utilization of data, maintaining its privacy and security, ensuring proper data transport across systems, and adhering to best practices for data governance. Making data usable includes critical actions applied to the data before it can be used such as cleaning, harmonizing, transforming, merging/joining and validating data, as well as data quality evaluation. As a critical asset, security, management, and privacy protocols are vital to support business needs to ensure compliance, ethical standards, and trust in output and outcomes from derived data. This domain also addresses the elements of what data is owned, used, and produced. Understanding the use of data inventory and documentation is incorporated in this domain to ensure repeatable processes and the ability to manage the volume, velocity, variety, and veracity of data.

- Task 3.1 Identify and prioritize data needs.
- Task 3.2 Identify and analyze data sources including data structures.
- Task 3.3 Create a data management plan.
- Task 3.4 Acquire data.
- Task 3.5 Clean, harmonize, transform, merge/join, and validate data.
- Task 3.6 Assess data quality and identify relationships in the data.
- Task 3.7 Document and report data findings (e.g., data quality, impact analysis, results, data management plan.)
- Task 3.8 Validate and update the business and analytics problem statements.

Domain IV: Methodology (Approach) Framing

The **Methodology (Approach) Framing** domain involves selecting the appropriate analytical methods, tools, and technologies to solve the defined analytics problem. This ensures that the chosen approach aligns with the problem type, available data, and resource constraints. The domain includes identifying suitable analytical techniques based on the nature of the problem, as well as evaluating and selecting the best-fit methods considering available data, timeframes. and organizational resources. The domain includes the selection of a compatible technology stack to effectively implement the solution.

Choosing the right methodology is critical to delivering valid, scalable, and actionable insights.

- Task 4.1 Determine available and appropriate methods/techniques for the identified problem.
- Task 4.2 Evaluate and select methods/techniques, given the resources and available data.
- Task 4.3 Understand the technical solution architecture.
- Task 4.4 Evaluate and select the technology stack.

Domain V: Analytics/Model Development

The **Analytics/Model Development** domain covers activities related to designing, building, and refining models, as well as documenting and communicating the results. The domain incorporates designing the model structure, building the appropriate models, running and evaluating model performance to ensure reliability. It also addresses identifying, using, calibrating, and integrating models as well as the documentation of the model and communication of findings. The domain emphasizes documenting and communicating findings, including assumptions and limitations, to maintain transparency.

This domain ensures that models are reliable, well-understood, appropriately tested, and effectively support decision-making.

- Task 5.1 Design the model structure.
- Task 5.2 Build one or more appropriate models.
- Task 5.3 Run, verify, and evaluate the model performance and outputs.
- Task 5.4 Calibrate model and improve data applicability based on client input.
- Task 5.5 If necessary, integrate multiple models.
- Task 5.6 Document and communicate model findings including assumptions, limitations, and constraints.

Domain VI: Deployment

The **Deployment** domain covers activities related to delivering the analytics solution and ensuring it is effectively integrated into the business environment. This involves performing business validation of the solution and a report of the validation findings. It includes securing sponsor agreement and stakeholder alignment to proceed with deployment. The deployment activities support the implementation, migration, and testing of the solution for production, ensuring it functions as intended. Analytics plays a key role in this domain as it involves validation and verification, working in conjunction with technology management, and production data flows. This domain also includes the role of analytics in evaluation of deployment challenges to determine best resolution through data, model, technology, or operational environment conditions. This domain ensures the analytics solution is successfully adopted, integrated, and delivers business value.

- Task 6.1 Perform business validation of the analytics solution.
- Task 6.2 Deliver business validation report with findings.
- Task 6.3 Obtain sponsor agreement and stakeholder alignment on moving forward with deployment.
- Task 6.4 Create requirements for a deployed analytics solution including model, usability, system and business.
- Task 6.5 Actively support the implementation and testing of the production analytics solution/system.
- Task 6.6 Actively support deployment validation and verification, including production data flows.

Domain VII: Analytics Solution Lifecycle Management

Analytics Solution Lifecycle Management domain involves ongoing oversight and calibration to ensure the analytics solution continues to perform effectively and delivers valid results over time that continue to deliver business value. Ongoing training activities are incorporated in this domain to ensure optimal performance management. The domain includes tracking solution performance, covering recalibration and maintenance to keep the solution accurate. Another task validates the business case periodically to confirm continued value, and another task ensures documentation is kept up to date taking into consideration context, environment, and the need for delivering effective end results. Continuous lifecycle management is critical in sustaining the impact and reliability of analytics solutions.

- Task 7.1 Track analytics solution performance.
- Task 7.2 Recalibrate and maintain the analytics solution.
- Task 7.3 Support training activities.
- Task 7.4 Validate the business case for the analytics solution over time.
- Task 7.5 Analyze side effects of the analytics solution over time.
- Task 7.6 Ensure documentation is complete and/or maintained.