

INFORMS Analytics Framework: *Implementation Guide*

At minimum, you should be able to answer these questions in your own words by the time you complete your case challenge. Consider these questions a guide for the efforts of your team. Return to them as needed as you develop your solution until all can be confidently answered.

Domain I: Problem Statement

- What is your problem statement and what is unclear or undefined?
- What are the challenges and opportunities related to your problem?
- What is the scope of your problem and what is within your ability to solve?
- Who has a vested stake in your problem, how would you categorize them, and are their perspectives met by the problem statement?
- What are the types of measurable benefits, costs, risks, and direct/indirect consequences associated with a solution?

Domain II: Analytics Framing

- In what way does your problem lend itself to a diagnostic, descriptive, prescriptive, or predictive solution?
- What are the inputs/outputs associated with the problem and what do you propose their relationship to be?
- What is the quantifiable measure of success in your solution?
- What is the measurable baseline state of the problem area without a solution implemented?
- What are the assumptions, constraints, and risk mitigation strategies that contribute to your solution?
- What work/scholarship already exists in the problem area?

Domain III: Data

- Are there privacy, security, or use issues associated with the available data that raise any ethical concerns?
- What are the “V”s of your data? (ex: volume, velocity, exc...)
- Have you documented the limitations of your data and assessment of if the data is of sufficient amount and quality to create your solution?
- What steps have you taken to refine or synthesize your data and have you documented the process of doing so?
- What visualizations exist for characterizing your data?

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Domain IV: Method Selection

- What are all of the methods available to solve your problem and what are their technical and practical strengths and weaknesses?
- Do your problem type, time frame, project constraints, and available data lend themselves to your chosen method?
- What are all of the technologies available to implement your problem solving method and what are their technical and practical strengths and weaknesses?
- Do your problem type, time frame, project constraints, available data, and chosen method lend themselves to your choice of technological implementation?

Domain V: Development

- How did you go about designing, building, testing, and refining your solution and have you documented these steps?
- How does one interpret the output of your model?
- How did you evaluate the performance and reliability of your solution?
- What are the assumptions, limitations, and biases associated with your solution and how did you go about addressing them?
- How would you communicate the answers to the previous questions to a non technical audience?
- What different iterations of the solution have you gone through and can you revert back to a previous model if needed?

Domain VI: Deployment

- What environments could your solution be integrated in and how?
- Which parties would need to be involved in bringing your solution into production and what would be required of them?
- What differences would you expect in a real world deployment and what would be needed for your solution to address these differences?
- What tests would you design to validate the solution is effective in a real world implementation?
- What are the ethical risks of a real world implementation?

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Domain VII: Lifecycle Management

- How would you go about the ongoing training of your model after it is deployed in the real world?
- How would you go about continuing to validate the effectiveness of your model in the real world?
- What in your deployment environment might change over time and how would those changes alter the effectiveness of your solution?
- How might the original problem statement evolve over time and how would those changes affect your solution?
- How would you go about identifying unforeseen side effects in a real world deployment as they arise?