INFORMS Analytics Framework (IAF)

The Proven Guide to Developing Analytics Solutions

Presentation for the 2025 Data 4 Good Competition

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INFORMS* Analytics Framework (IAF)

Agenda:

I. Learning Objectives
II. Overview of the IAF – what is it and why it matters
III. Understanding the Domains – 1 through 7
IV. Visualizing the IAF in action
V. Sample High Level Use cases
VI. Review IAF™ and what is CAP®
VII. Outcome with or without IAF
VIII. Attendee resources from INFORMS

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*Institute for Operations Research and the Management Sciences

INFORMS Analytics Framework (IAF)

Learning Objectives

- Provide a high level understanding of the seven domains essential to successful analytics efforts.
- Demonstrate sample use case scenarios to show you how the framework applies to actual situations.
- Show how the IAF as a framework enables a thorough way to develop and enhance credible analytics solutions and justify adoption of the outcomes.
- Determine if analytics is even applicable and then applying the appropriate analytics to achieve stakeholder expectations to answer a question or address a problem.
- ***Be able to use the IAF in your competition submission as required by Data4Good.***

INFORMS Analytics Framework (IAF)

What it is and how it was developed

The INFORMS Analytics Framework is a guide that outlines the full lifecycle of analytics implementation.

- Defines analytics roles, responsibilities, and tasks essential for solving business problems, questions, and opportunities
- Enables impactful decisions across business, research, healthcare, education, and hiring scenarios
- Captures lessons learned from experienced practitioners through decades of trial and error to deliver measurable value
- Translates proven practices into actionable, repeatable guidance
- Is vendor, software, and methodology neutral
- Developed by experienced practitioners with input from the analytics community

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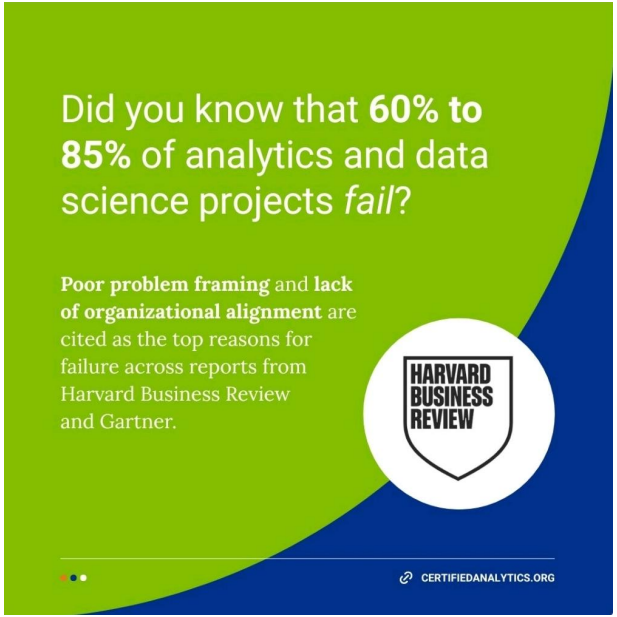
Why it matters

- Provides structure for analytics initiatives that often fail and do not deliver value due to poor alignment and unclear objectives
- Many analytics efforts start with data or tools rather than a business problem (question); the IAF helps professionals navigate back to problem framing and alignment with an outcome objective
- Serves both new and experienced professionals applicable in multiple situations and objective types

Core Benefit

- Ensures analytics efforts are aligned with actual business and sponsor requirements to achieve success



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DOMAIN I	DOMAIN II	DOMAIN III	DOMAIN IV	DOMAIN V	DOMAIN VI	DOMAIN VII
Business Problem (Question) Framing	Analytics Problem Framing	Data	Methodology (Approach) Framing	Analytics/ Model Development	Deployment	Analytics Solution Lifecycle Management

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INFORMS Analytics Framework (IAF)

THE DOMAINS

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IAF Domain I - Business Problem(Question) Framing

Objective:

- **Defining the Business Problem (Question) framing is the most important, critical activity in any analytics initiative.**
- Analytics methodologies are applied to problems, which are sometimes stated as questions
- Any application of analytics must have a clear, concise statement describing the business problem or question, not a technical one.
- The goal here is to ensure that analytics is being applied to solving the right challenge for the organization.
- This activity aligns stakeholders with the agreed upon business objective and the analytics outcome

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IAF Domain I - Business Problem(Question) Framing

Activities to anticipate:

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

Why this is important:

- If you do not frame your objective, confirm it is an analytics opportunity, will provide business value, how do you know you are solving a problem or answering a relevant question?
- Without answering this, you are running at high risk and probable failure
- Often analytics initiatives do not start with the Problem Framing
- These activities are essential for ensuring that a clear, actionable problem is defined before seeking solutions
- Communication and outreach is critical

IAF Domain II - Analytics Problem Framing

Objective:

- To determine whether analytics is the right approach for the problem (question).
- This domain translates the agreed-upon business problem into an actionable analytical structure.
- Determine what type of analytics problem it is.

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IAF Domain II - Analytics Problem Framing

Activities to anticipate:

- Identify baseline and measure of success
- Identify drivers, inputs, and assumptions
- Determine whether the current ways decisions are made in the business process supportable by analytics and what the business impact of this would be

Why this is important:

- Clarifies the problem you are trying to solve or the question you are trying to answer
- Sets the stage for implementing an analytics solution
- Process may end here if the business problem/question is not suitable for analytics

IAF Domain III - Data

Objective:

- Data preparation and evaluation is the most time-consuming domain. Frequently this is the majority of effort when leveraging analytics to deliver business value.
- Often analytics efforts start in Domain III without a clear business objective.
- A strong, defined data approach is essential, as data quality, usability, ownership, privacy/security issues can invalidate even the best models.
- Understanding your data landscape enables an understanding of what you own, what you use, and what you will create.

IAF Domain III - Data

Activities to anticipate:

- Data cleansing, harmonization, transformation, validation, risk, bias, and quality assessment.
- Impact assessments of privacy, security, and compliance to maintain trust and ethical standards, while also managing data ownership, usage, and production.
- Retention, portability, secure computing, and policy impacts.
- Creating derived data from your solution

Why this is important:

- Comprehensive data documentation and inventory practices enable repeatable processes, ensure reliability, and effective management of data to support the solution
- The data domain focuses on identifying, managing, and preparing data to ensure it is usable, secure, and properly governed for analytics purposes.

IAF Domain IV - Methodology (Approach) Framing

Objective:

- Selecting the appropriate analytical methods, tools, and technologies to solve the defined analytics problem.

- To ensure that the chosen approach aligns with the problem type, available data, and resource constraints.

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IAF Domain IV - Methodology (Approach) Framing

Activities to anticipate:

- Method selection
- Determine software tools, architecture, and technology stack
- Determine development, testing, deploying environments and procedures.

Why this is important:

- The approach to problem solving should fit the question, resources, computing environment, and be repeatable
- This informs the transition to the development and a solution that will be able to be used in production

IAF Domain V - Analytics/Model Development

Objective:

- Design and build multiple models
- Verify and compare model performance
- Integrate multiple models if beneficial
- Revise based on client feedback
- Document process and communicate model findings

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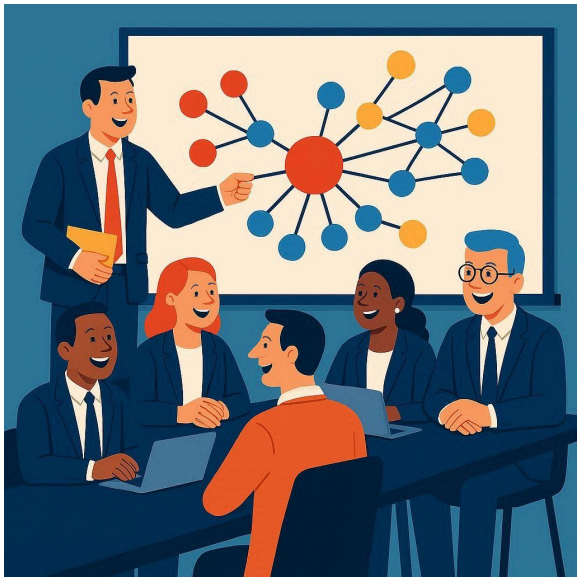
IAF Domain V - Analytics/Model Development

Activities to Anticipate:

- Identify biases, assumptions, and limitations
- Interpret I/O relationships
- Verify your outputs
- Create visualizations for your model and its performance
- Document, document, document

Why this is Important:

- You create your solution
- You ensure your solution is reliable



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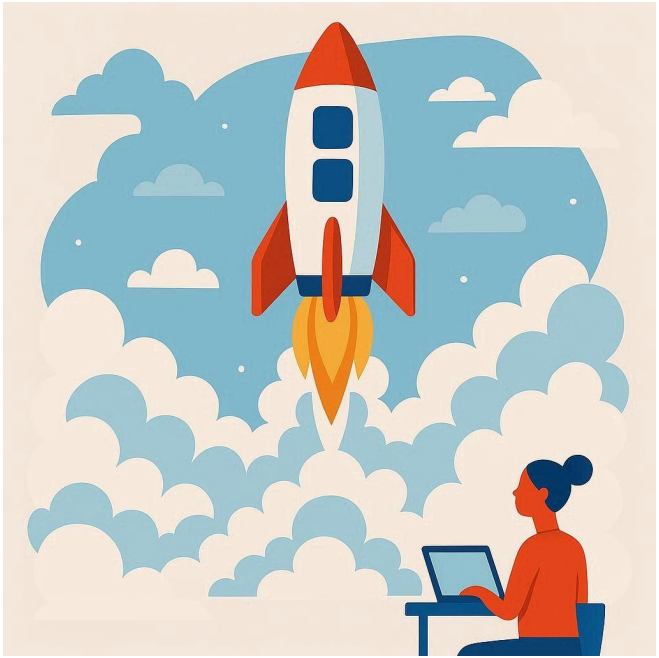
IAF Domain VI - Deployment

Objective:

- Includes initial business validation, testing, and change management
- With multi-disciplinary team, migration from development into production:
  - Technical implementation
  - Organizational adoption
- Verify the deployed solution is working correctly



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IAF Domain VI - Deployment

Activities to anticipate:

- Pre-deployment:
  - Testing
  - Business validation
  - Operational readiness
- Deployment
- Training
- Post-deployment
  - Verifying production data flows

Why this is important:

- Communication and support during deployment, change management, to address issues in implementation
- Verify solution is working correctly and data is flowing reliably
- Promote adoption of solution or data product

IAF Domain VII - Analytics Solution Lifecycle Management

Objective:

- Ensure solution continues to provide value
- Continue to train model on new data and perform regular maintenance
- Identify changes in the model's operating environment
- Adapt the model to changes in the business objective and circumstances

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IAF Domain VII - Analytics Solution Lifecycle Management

Activities to Anticipate

- Update the model
- Identify side effects of the model
- Explore cost/benefits of the model
- Identify changes in the data stream the model receives
- Identify key factors that affect model output
- **DOCUMENT**

Why this is Important:

- Your solution needs to be sustainable & adaptable!

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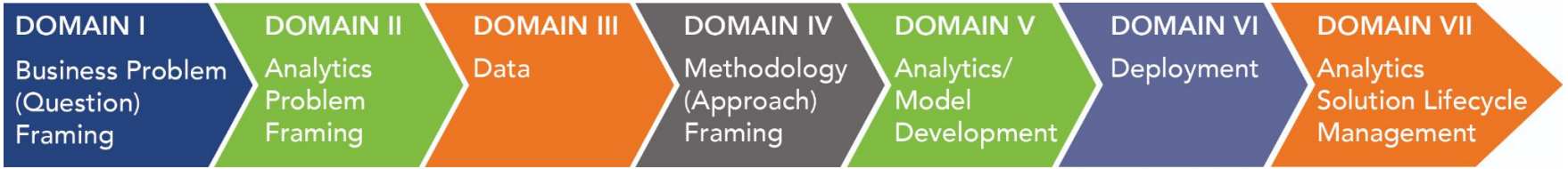

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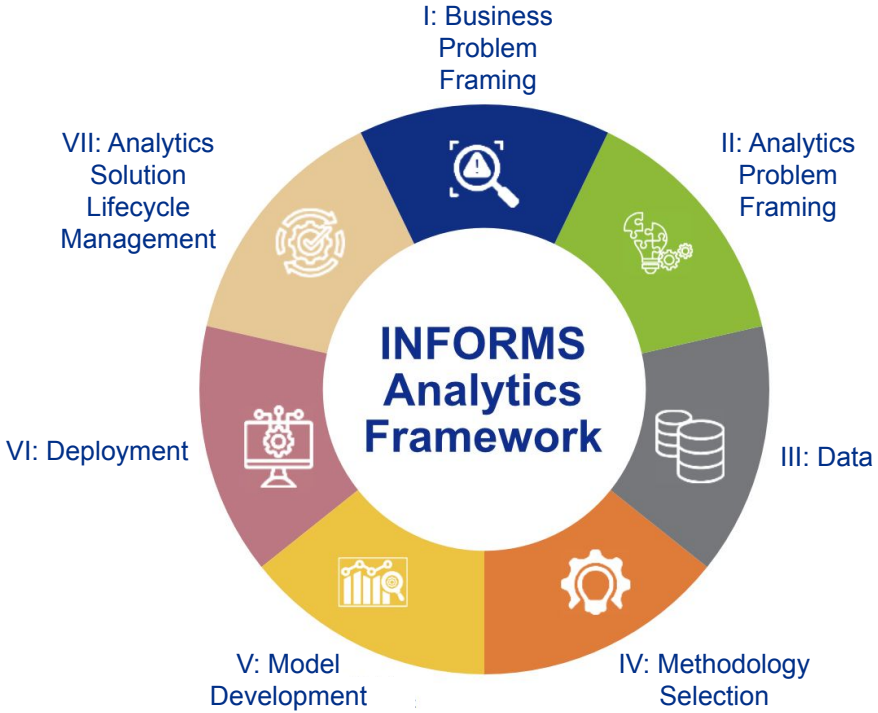

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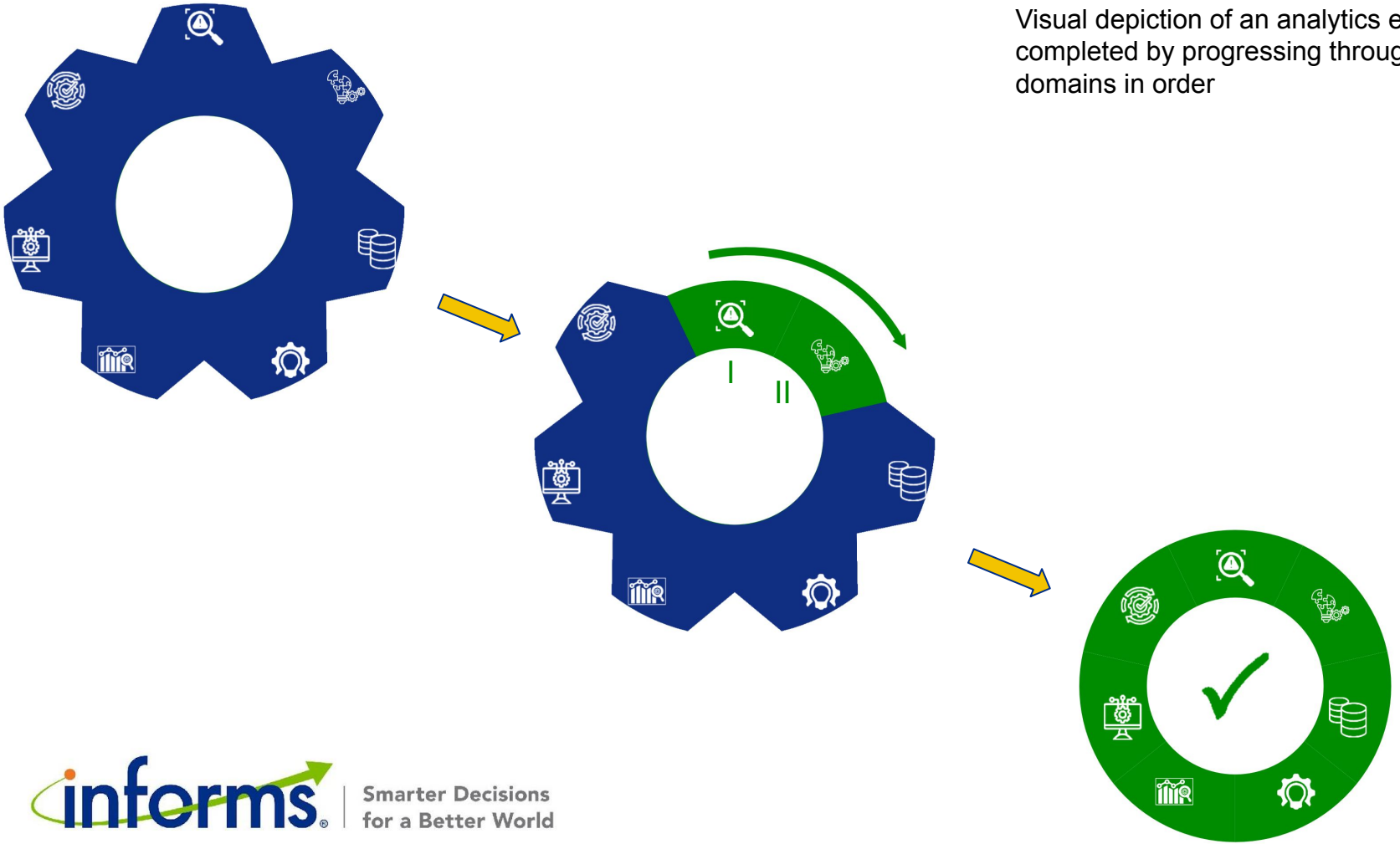
Visual depiction of an analytics effort completed by progressing through the domains in order



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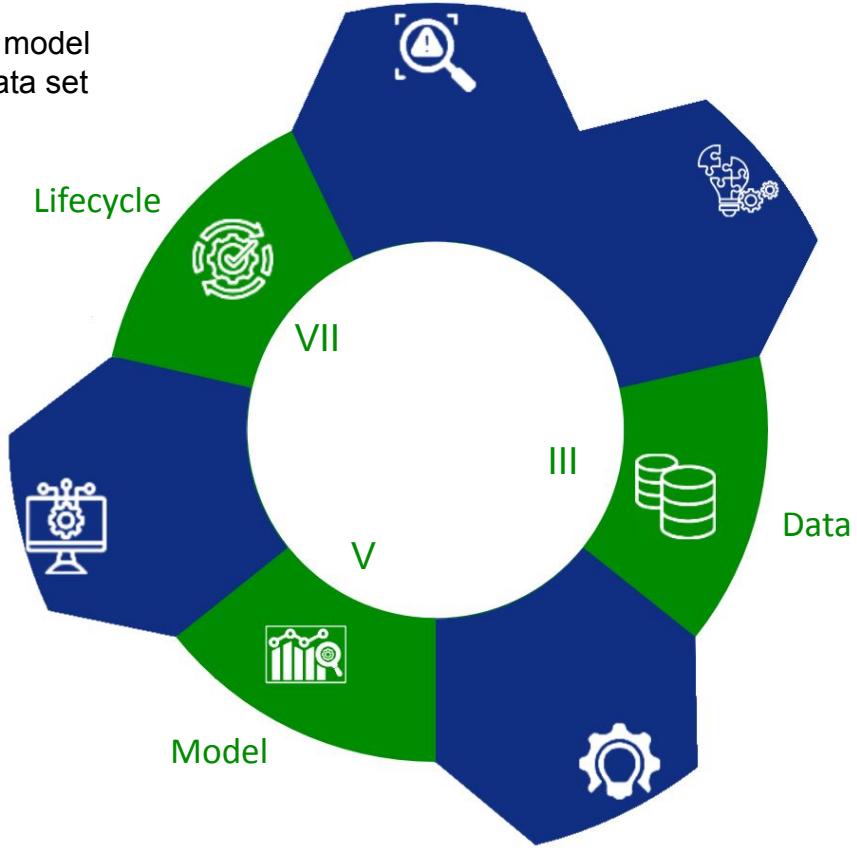
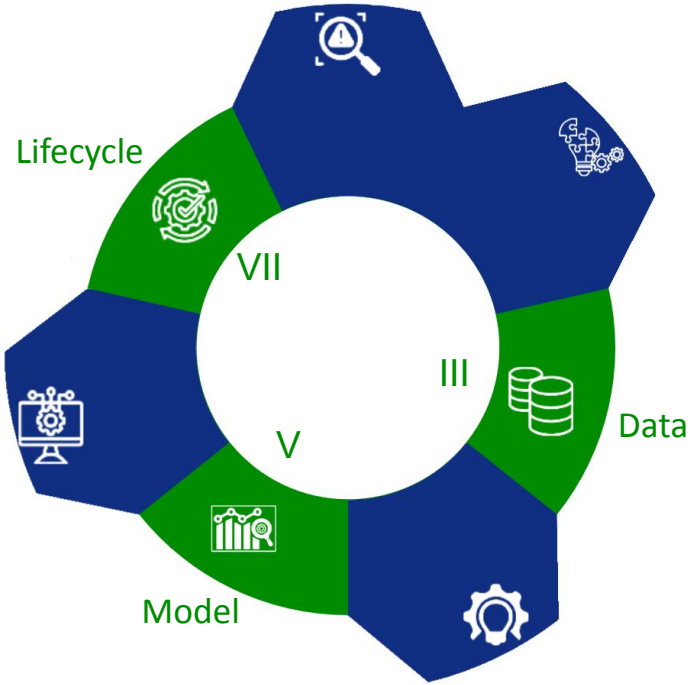
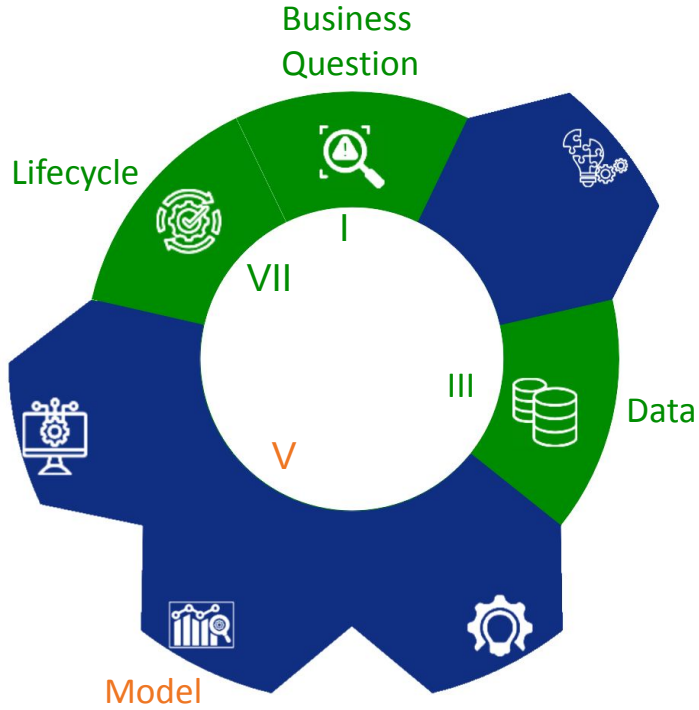
Situation:
You are brought onto a team with a model already deployed and an existing data set



Navigating:
Circle back to the business question and discover the need for a new model





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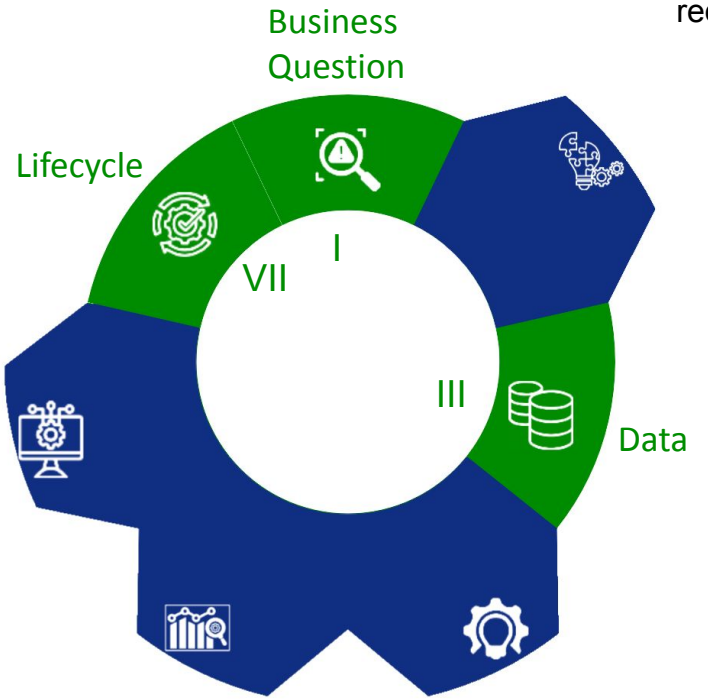
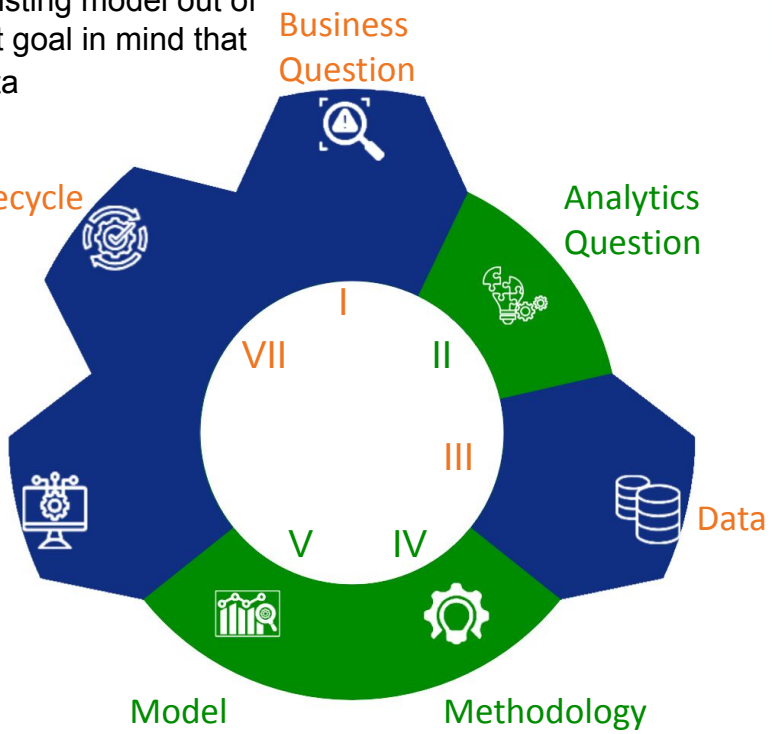
Navigating:

Frame the question as an analytics one and develop a new model, but when you take the existing model out of deployment your boss has a different goal in mind that requires different data





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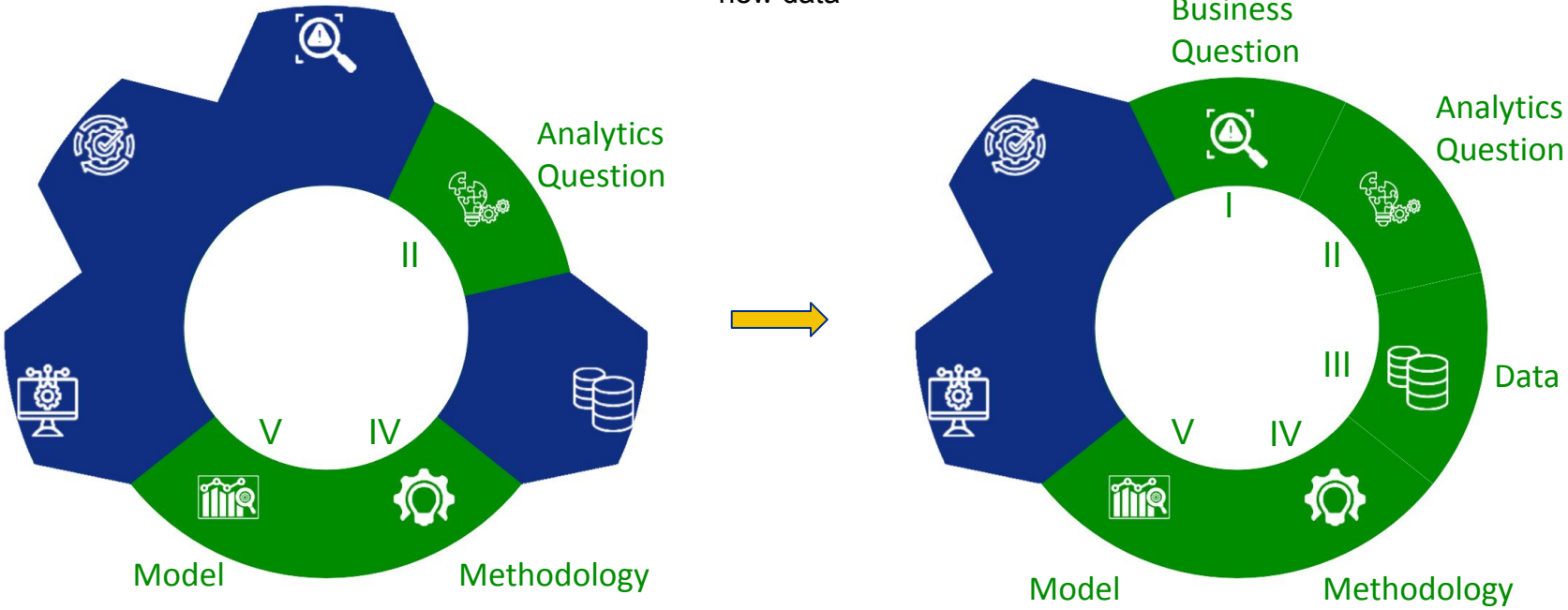
Navigating:

Reassess the new business question find that it lends itself to a similar analytics question and thus the same model you had worked on. Acquire and adjust model for new data



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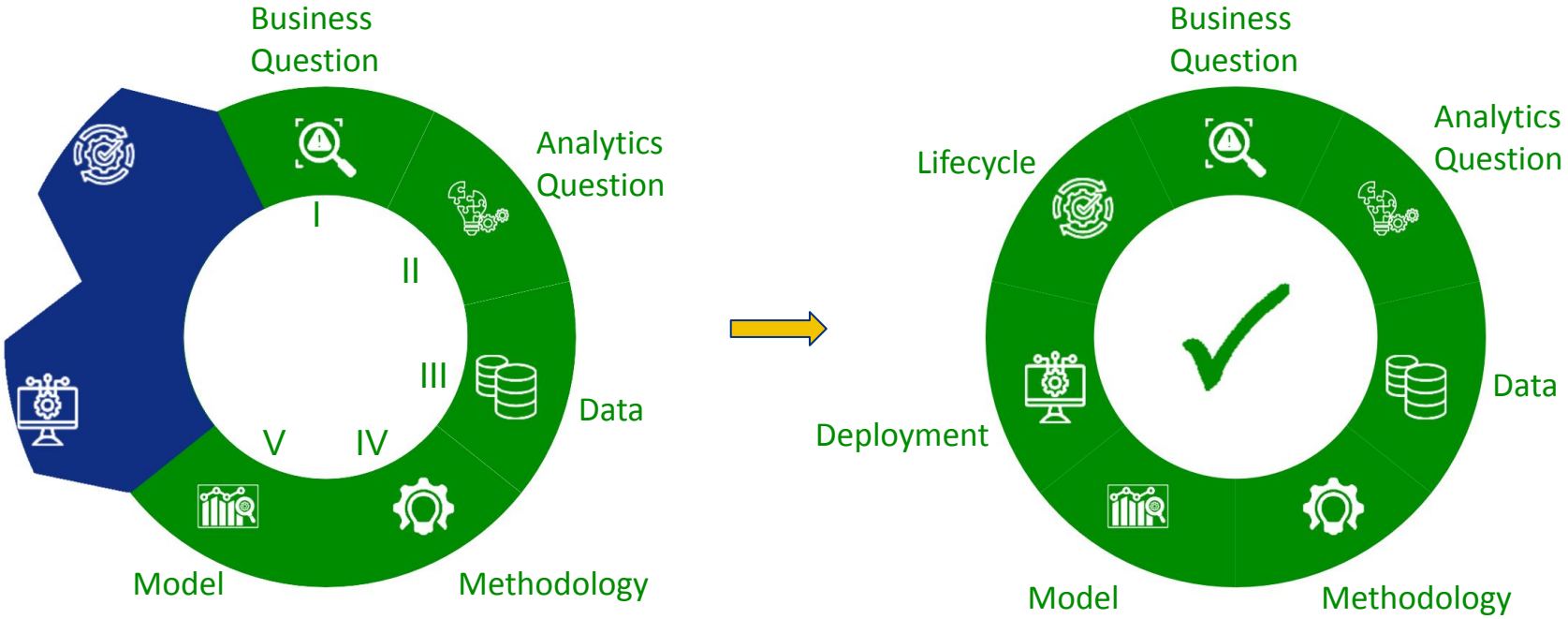
Navigating:
Deploy your model and monitor its performance



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USE CASES

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USE CASE 1 - Description

You do analytics work for a hospital. Your boss just bought a new AI tool. He wants you to do “something” with it.

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USE CASE 1 - Using the IAF

Domain III, IV, & VI: Assess available data, AI capabilities, and operating environment

Domain I & II: Survey hospital staff to identify an analytics opportunity and define it

Domain V: Develop and test solution

Domain VI & VII: Deploy and hand off solution

USE CASE 1 - With and Without the IAF

With IAF

Domain I: Identified a clear area in which the new software capability could add value

Domain II: Operationalized analytics as the way to assess the performance of your solution

Domain III: Extracted relevant data for your opportunity that complies with hospital policy

Domain IV: Assessed new software capabilities

Domain V: Created a solution that saves the hospital money

Domain VI: Smoothly facilitated the solution's adoption by users and integration by IT

Domain VII: Outlined the ongoing assessment and maintenance of the solution for its ongoing success without your supervision

Without IAF

- Time wasted without guidance on identifying a clear opportunity
- Creation of something incompatible with technical capabilities
- Poorly communicated solution goes unused
- Legal consequences for violating privacy policy

USE CASE 2 - Description

A city municipal court has accumulated a vast amount of data over the years—case filings, court schedules, payment records, violation types, defendant demographics, and hearing outcomes. Court administrators are unsure how to turn this “bunch of data” into actionable insights for smarter operational and policy decisions.

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USE CASE 2 - Using the IAF

Domain III:

This case starts in Domain III, it is important to get an understanding of the data, how it was collected, what it can be used for, and what privacy and other restrictions are placed on it.

Domain I:

Identify business problems that could be addressed, narrow these down.

Next Step Domain II: Reframe as analytics problem. Identify drivers/inputs/outputs. Can the data be used to solve these analytics problems?

USE CASE 2 - With and Without the IAF

With IAF

Domain I and II: Clear objectives and stakeholder alignment around well-defined analytics problem applicable to court system

Domain III: Data leveraged effectively and ethically, use suits collection method

Domain IV: Methodology meets needs of analytics problem and data infrastructure

Domain V: Models provide actionable insights

Domain VI: Analytics solution is adopted into business processes with responsible use of sensitive data

Domain VII: Court continuously monitors, improves, and maintains analytic capabilities.

Without IAF

- When working with Personally Identifiable Information (PII), there are important privacy and use constraints that may be overlooked (e.g. custodial, divorces, case specific disclosure, intellectual property)
- Context for how data are generated might be misunderstood and data inappropriately used
- Data modeling generates insights but does not address any real business need

Review of IAF™ and What is CAP®?

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The INFORMS Analytics Framework™ (IAF) is a structured seven-domain approach that guides organizations in systematically managing analytics initiatives, helping ensure consistent, high-quality insights, effective decision-making, and measurable business impact. It outlines a structured approach from problem (question) framing to lifecycle management, and is used in various professional contexts.

CAP® 2013 INFORMS

The INFORMS Certified Analytics Professional (CAP®) is a globally recognized credential that validates an individual's expertise in the end-to-end analytics process, demonstrating their ability to transform data into valuable insights and drive informed business decisions. Earning the certification enhances professional credibility, career opportunities, and confidence in applying analytics to real-world problems. CAP® is ANSI Accredited.

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Just Remember…

With IAF

Provide effective value and trust to your organization, team, and clients.

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Without IAF

Risks, chaos, resource and financial losses, missed objectives, wrong assumptions, adverse impact, security exposure.

IAF Resources

- This Presentation: Email from D4G
- IAF Implementation Guide for D4G: Email from D4G
- IAF document: Email from D4G
- INFORMS Business Problem Framing Online Course 11/24/25
- For the full detailed framework for download is linked here: https://info.informs.org/analytics-framework
- The document includes how IAF is used in the three CAP exam criteria.

If you would like to explore the analytics professional certification:

- Certified Analytics Professional information https://certifiedanalytics.org/

"IAF the DNA of Analytics Success"

Thank you!

We wish you success in your analytics career and encourage you to look to INFORMS as a robust community of practice whether you are a seasoned practitioner or new to analytics.

Johan Bos-Beijer, Nicholas McMillan, Aiden Dumas

“IAF the DNA of Analytics Success”