MANAGING BUSINESS ANALYTICS PROJECTS

INTRODUCTION TO ANLYTICS

NIRMAL PALAPARTHI

OVER **5,900** GRADUATE ALUMNI

OFFERING OVER **130** ENTERPRISE IT, INNOVATION & LEADERSHIP PROGRAMMES

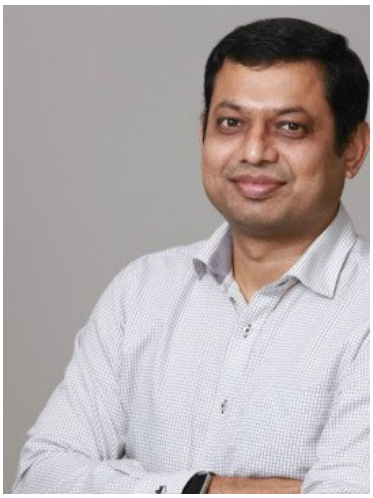
TRAINING OVER **130,000** DIGITAL LEADERS & PROFESSIONALS

Nirmal Palaparthi

Two decades of experience building practices. Co-founded two Analytics companies: Fractal Analytics, India's leading third party analytics provider and Mobius Innovations, a context awareness platform company. Consulted in 16 countries, across Banking, Retail, Telecom, Consumer Product and Enterprise Software verticals.

Prior Experience:

- Independent Consultant, Singapore
- CEO and Co-Founder, Mobius Innovations, Singapore
- Chief Architect and Co-Founder, Fractal Analytics, Singapore

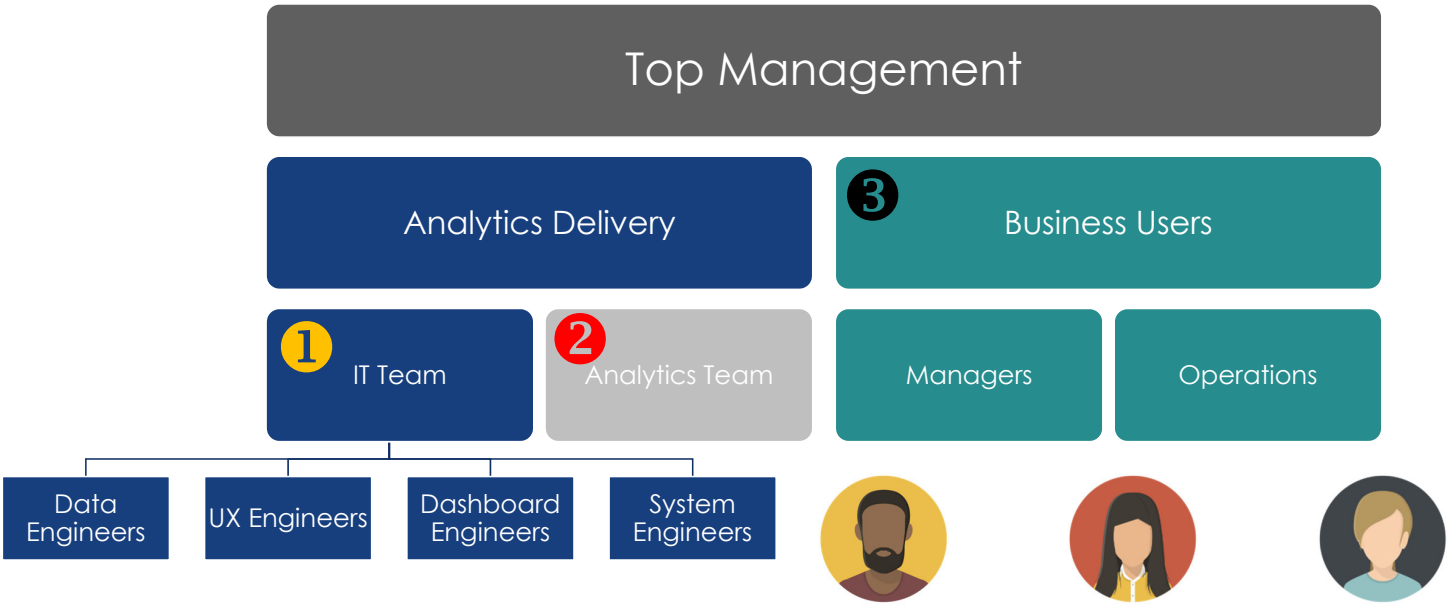


Topics

- ✓ Stakeholder perspectives
- ✓ Types of Analytics
- ✓ Analytics Process CRISP-DM methodology
- ✓ Prescriptive Analytics = Decision Engineering
- ✓ Deployment
- ✓ Case Study: ATM cash replenishment
- ✓ Analytics End to End Project Scoping Considerations

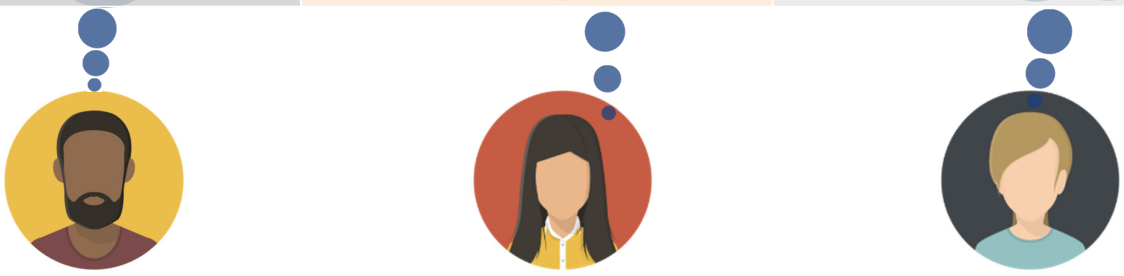
Stakeholder perspectives

Analytics Project Stakeholders

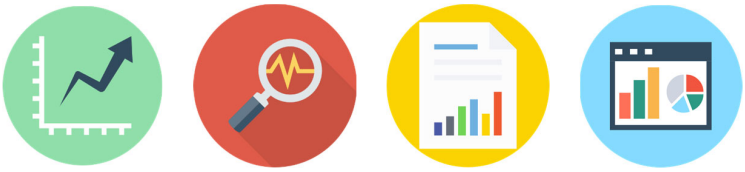


Stakeholders think differently

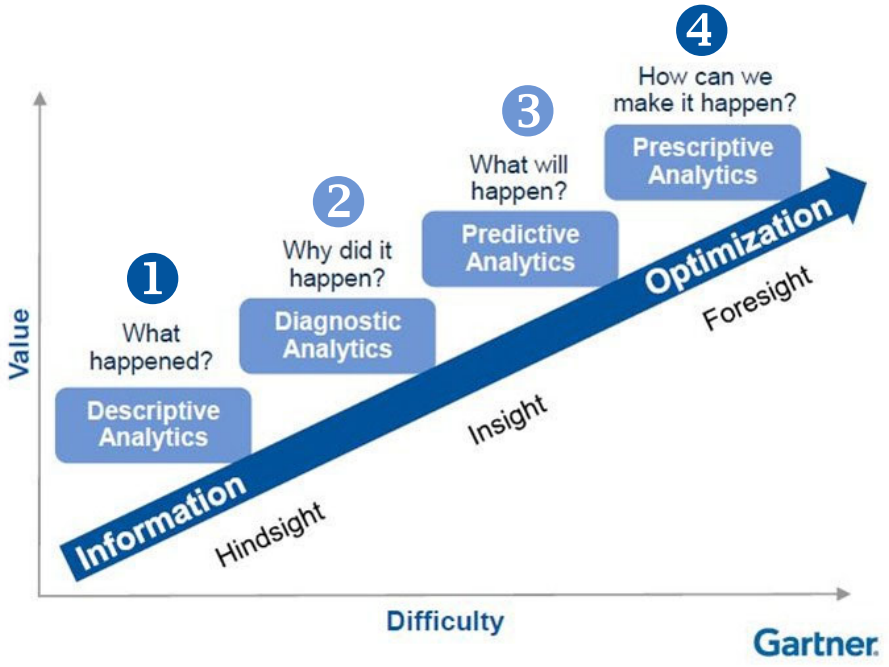
IT Speak	Analyst Speak	Business User Speak
First lay down the entire process	That's the last step	Why do you need to know the process?
What data do you really want?	Give me everything you have	Ask the Data folks
Plan and then Code	Think while Coding	I don't care
Has the user asked you for this?	Users don't know what they don't	Show me results
SDLC, Agile.	CRISP DM	Don't be pedantic about processes, deliver something that works



Types of Analytics



Analytics could answer different questions



Analytics in Airlines

Descriptive Analytics

Understand Demographic Characteristics of the recent passengers

1

Prescriptive Analytics

Launch an appropriate campaign to attract the right passenger segment

4

Analytics drives decisions across Industries

Banking
- Credit Decisioning
- Anti Money Laundering

Healthcare
- Clinical Trial Analysis
- Drug Discovery

Telecom
- Churn Prevention
- Product Development

Manufacturing
- Process Improvement
- Supply chain optimisation

Analytics is becoming pervasive

Retail
- Aisle traffic patterns
- Recommender Systems

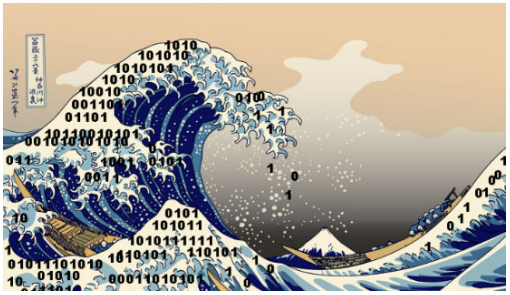
Government
- Smart city service management
- Common Data infrastructure

Airlines
- Yield Management
- Customer Service

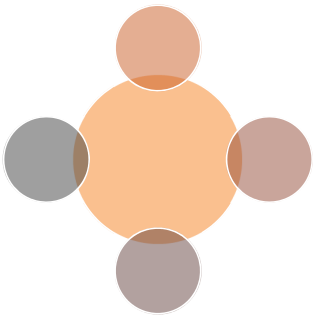
New Age
- Quantified Self Analytics
- Behavioural Nudging

Data Types create scope complexities

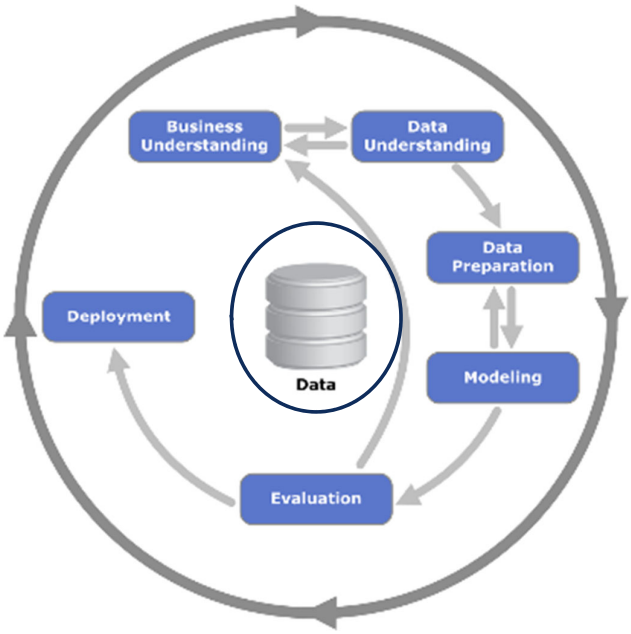
- Big Data Analytics
- Streaming Analytics
- Unstructured Data Analytics



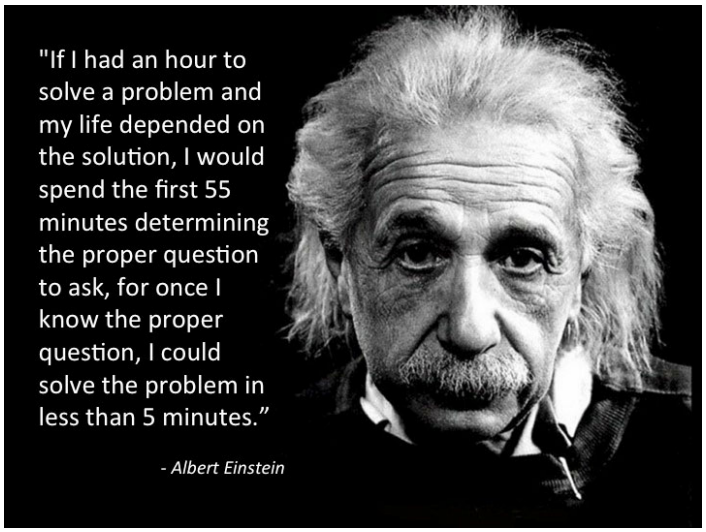
Analytics Process: CRISP DM



CRISP DM Cycle



Defining the Problem is half the solution



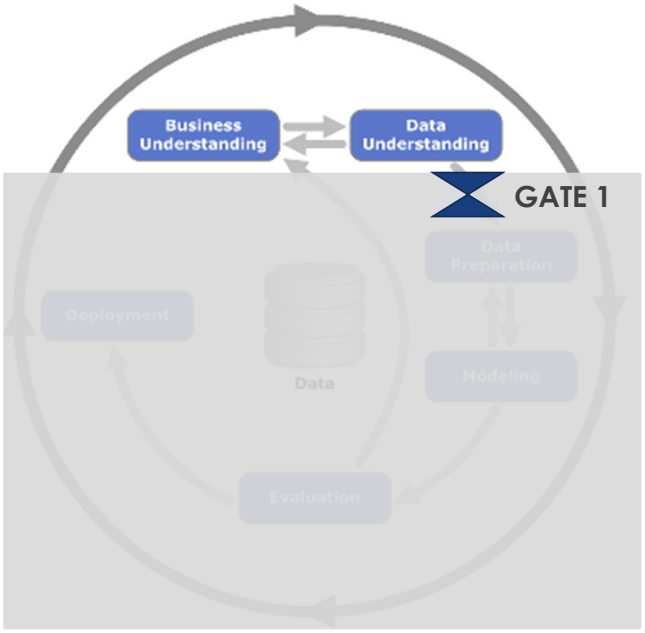
Business Understanding

- Who is the end user?
- What is the end benefit?
- How will the solution be deployed?
- What are the hypotheses of the business users?

- The most important step
- The most neglected step

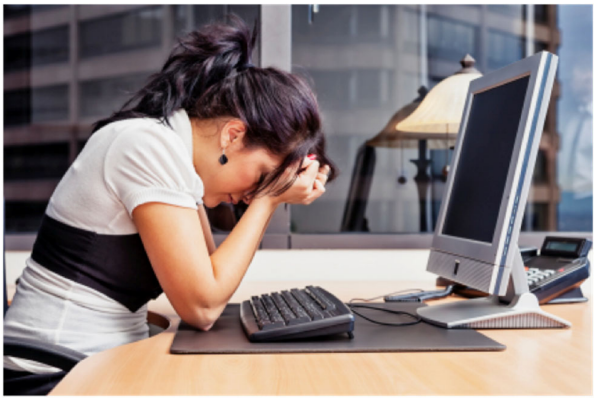
Gate 1: Inception of the Project

- Unless Business Understanding and Data Understanding are clear, you cannot move to the next stages of the project
- Unless you clear this stage, called Inception, you can only come up with a high level project plan



Data Understanding

- What data do you need?
- What data is available?
- How easy is it to access the data?
- Will the data be available during deployment?
- What are the privacy norms to comply with?



- Can you create data?
- How dirty is the data?


IT << >> Analytics


Data Wrangling

- The most time consuming step
- Data Janitoring
- Data Quality
- Data Transformation

- Budget Time
- 3x benchmark

IT << >> Analytics

Data Visualization

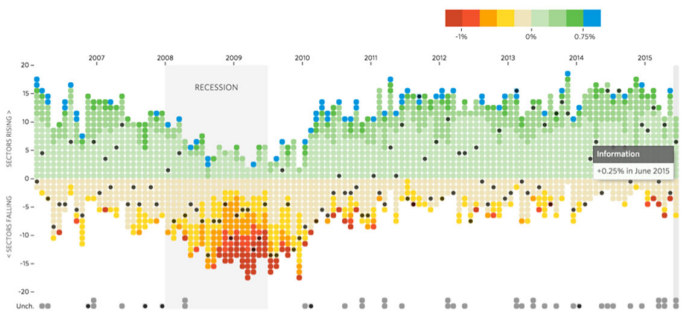
- What are the overall trends?
- Does business agree?
- Does this throw new insights?

- Gapminder.org

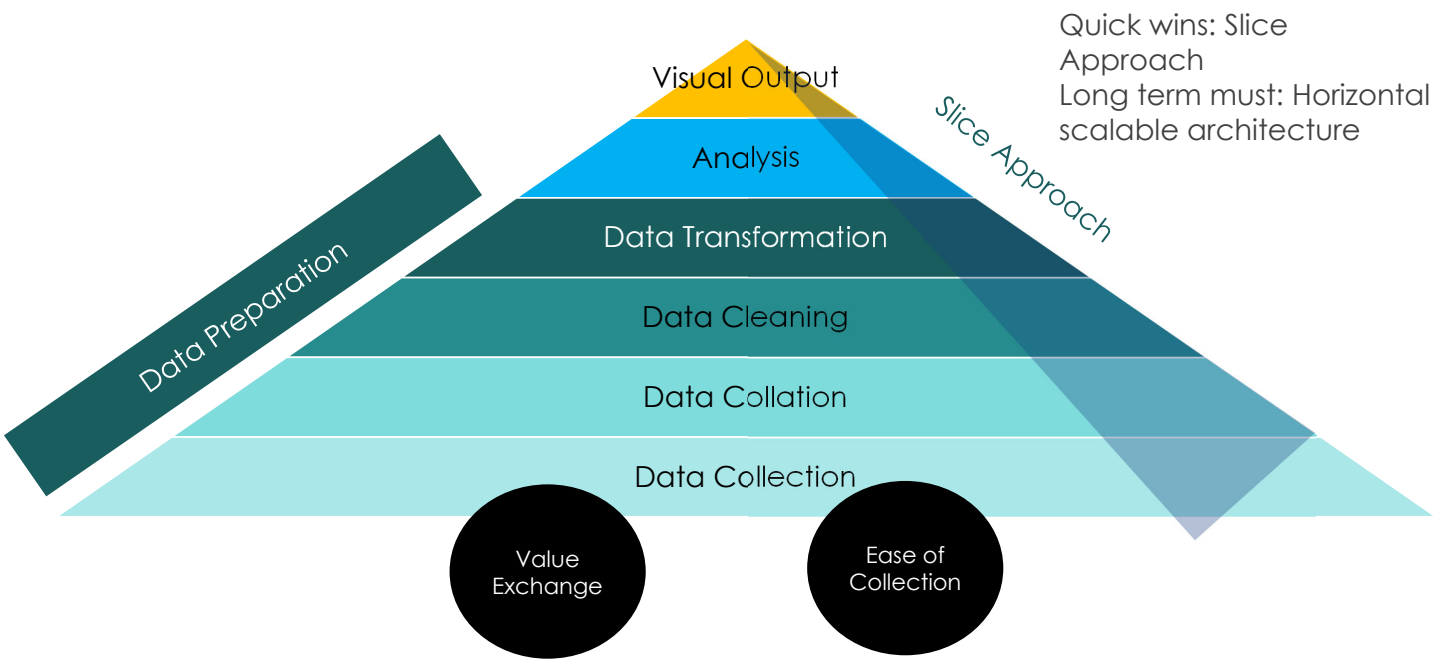
COULD SPIN OFF SEPARATE PROJECTS!

- Biggest wow factor, value addition
- Often neglected

Analytics



The data value chain



Quick wins: Slice Approach
Long term must: Horizontal scalable architecture

Modeling

- Is an approximation of reality
  - Use easy measurements to estimate difficult concepts
- Choose appropriate technique(s)

- A model is always approximate

Model Evaluation

- Training vs. Testing
- Out of time vs. Out of sample
- How "good" is the model?

		Prediction	
		Positive	Negative
Actual	Positive	TP	FN
	Negative	FP	TN

Prescriptive Analytics
= Decision Engineering

Take costs into account

		Predicted	
	Model A	No Infection	Infection
Actual	No Infection	630	50
	Infection	170	150

		Predicted	
	Model B	No Infection	Infection
Actual	No Infection	480	200
	Infection	70	250

22% misclassification

27% misclassification

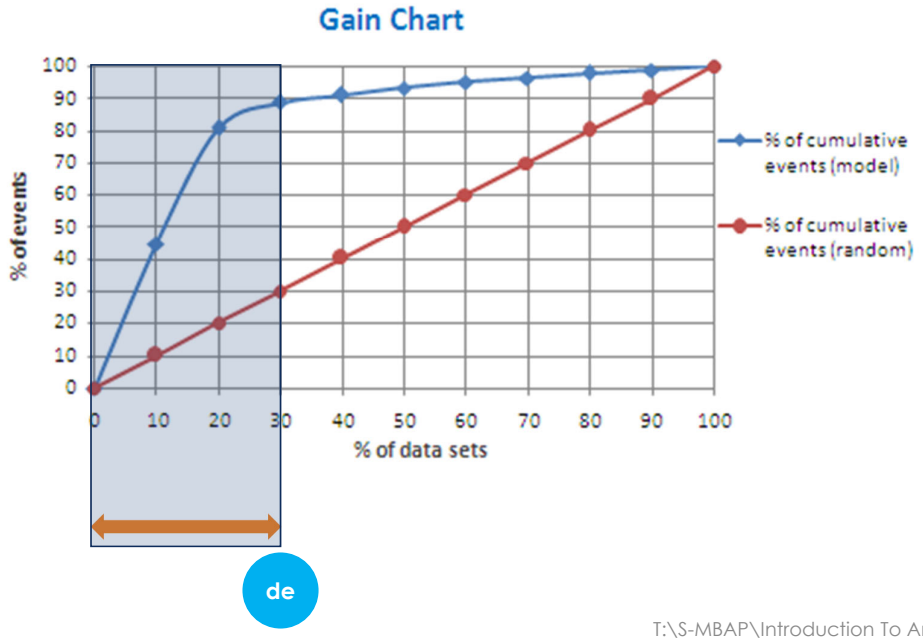
		Predicted	
		No Infection	Infection
Actual	No Infection	$0	$2,000
	Infection	$10,000	$0

$1.8 Million

$1.1 Million

de

Identifying the cutoffs depends on ROI



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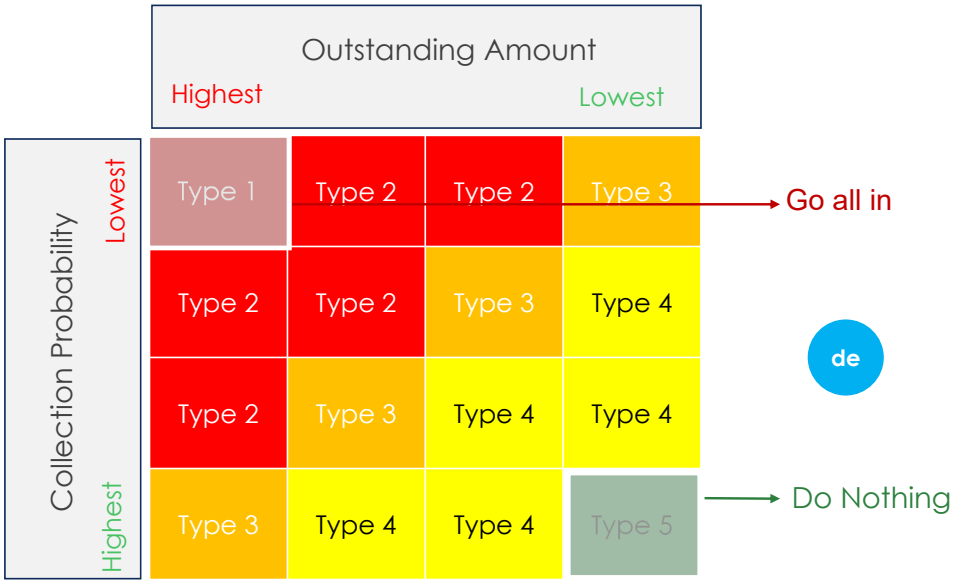
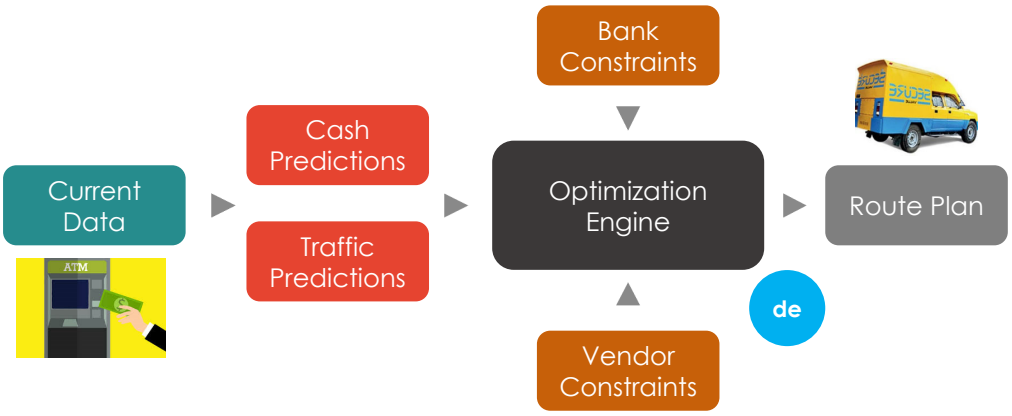
Decisions could be implemented through policies

- Each of the following Scenarios could have a different collections policy



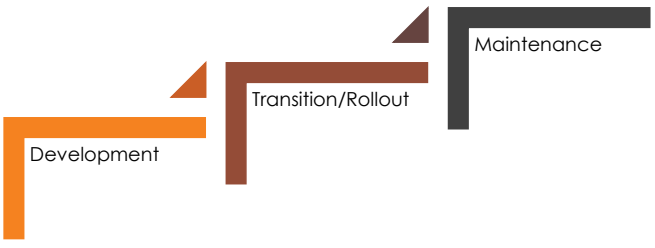
Decisions could be optimization problems

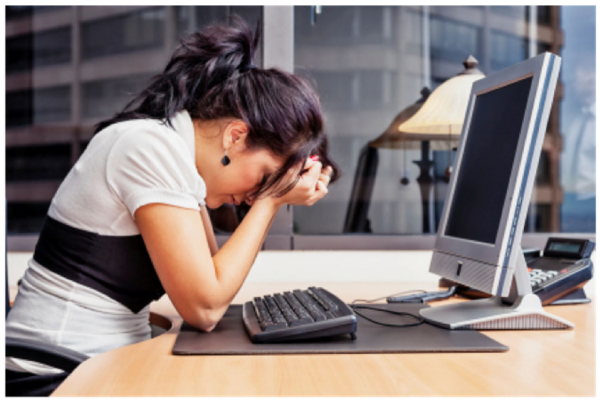
- Organisational constraints like cash availability and Vendor constraints like staff availability might influence optimisation parameters



Deployment

Deployment

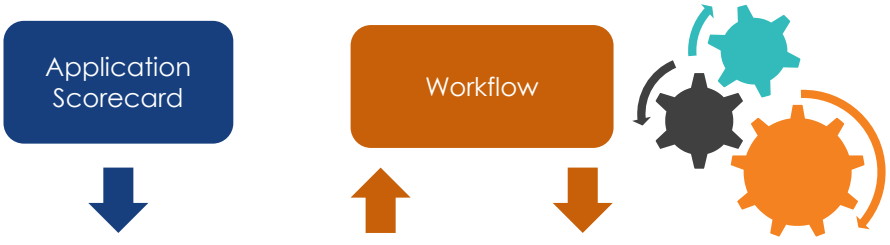




Prone to handover issues

Deployment

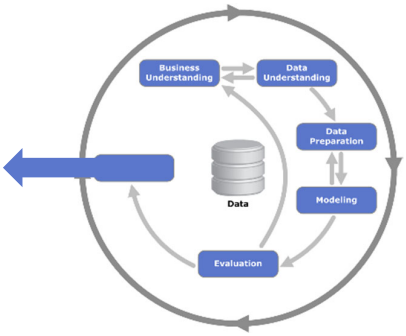
Decisions engineered create workflows



Application Score
Below 350
350 – 650
Above 650

Development of a Decision Making Unit

Component	Function
Sensors	Data Collection and Processing
Brain	Model Scoring
Actuators	Decision Execution Processing

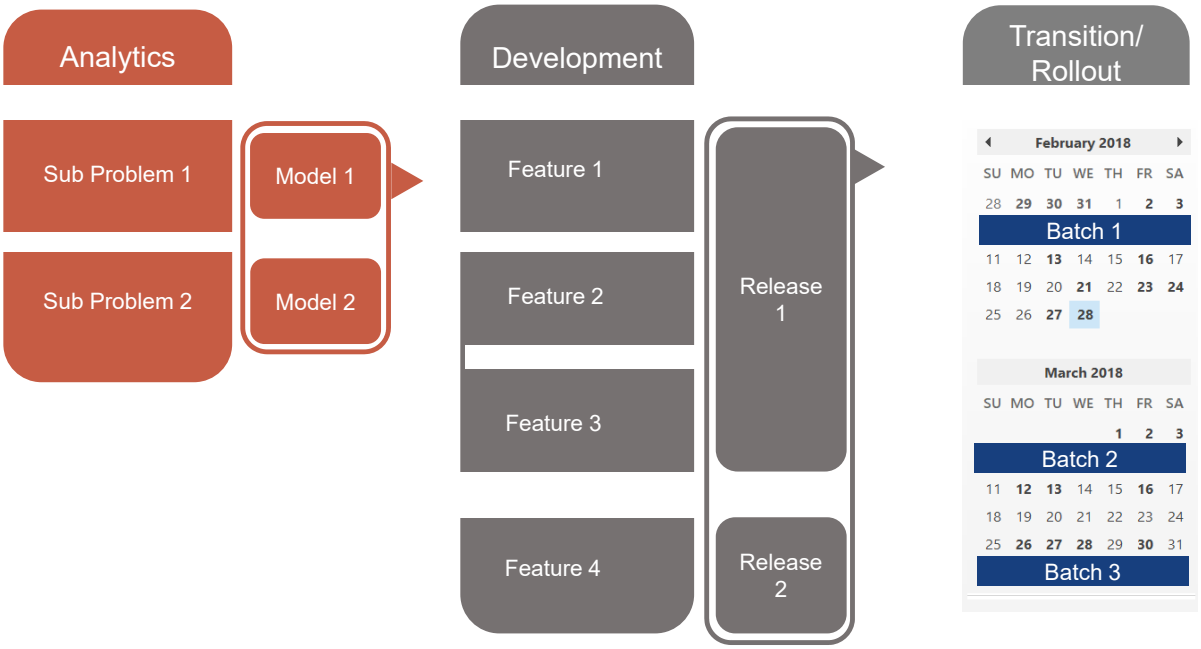


DEPLOYMENT ENGINE, NEEDS TO BE DEVELOPED

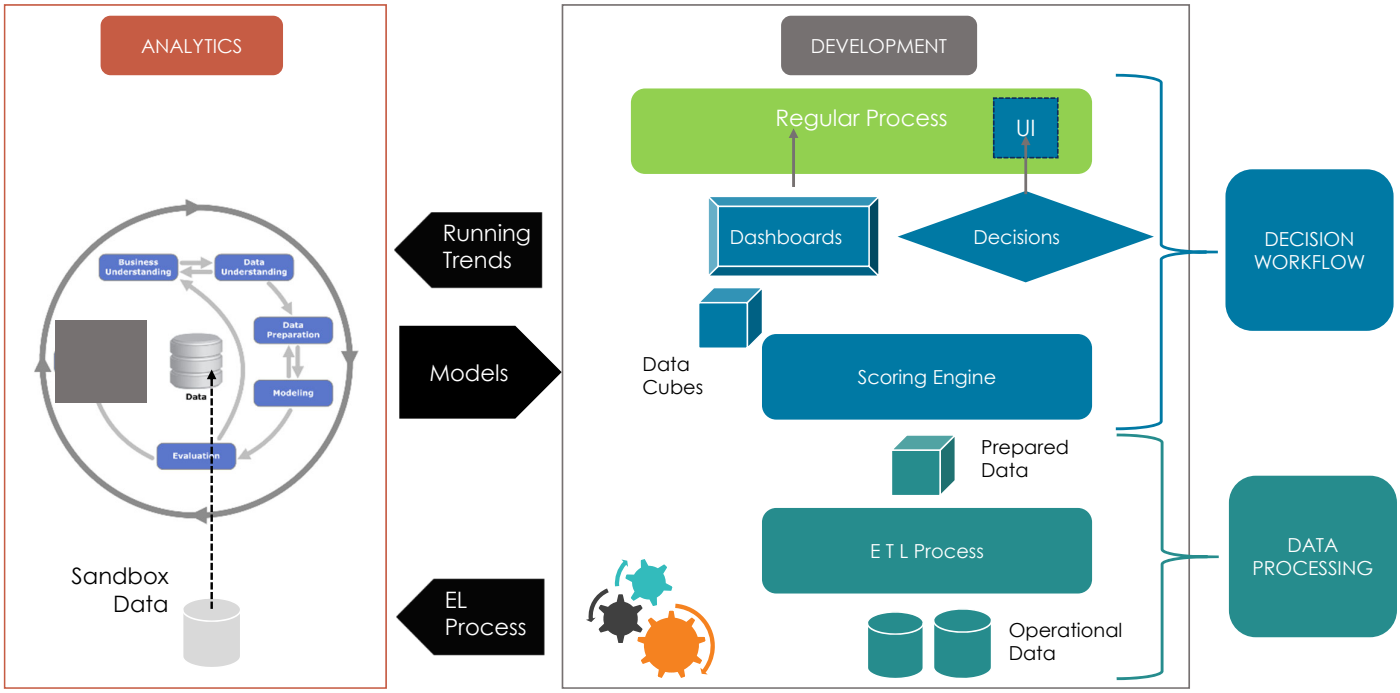
ANALYTICS

The Entire Handover

End to End cycles



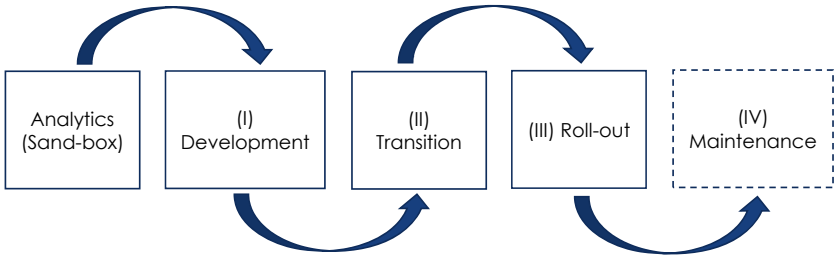
Execution architecture



Tools required at various stages

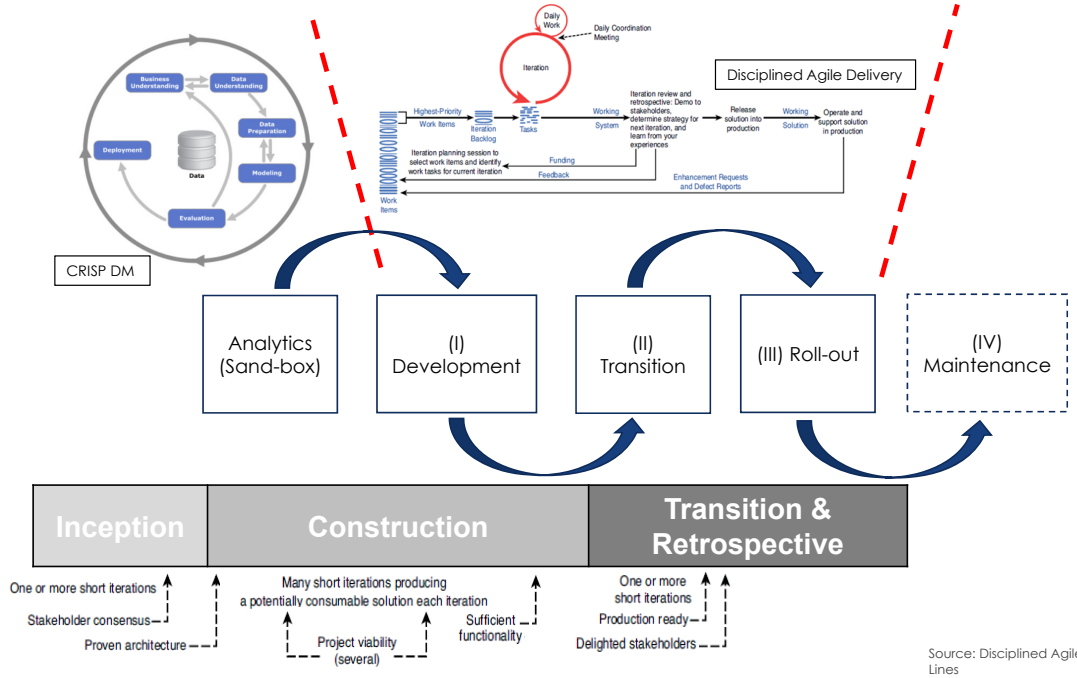
- Sandbox Data, Prepared Data, Operational Data
  - Databases: Oracle, Hadoop
- ETL Process, EL Process
  - Data Wrangling systems: SQL, Informatica
- Data Preparation
  - Data Preparation workbenches: R, SAS
- Modelling
  - Modelling Workbenches: R, SAS
- Models
  - Model Formats: XML, JSON
- Scoring Engine
  - Rule Engines: SQL Scripts, Drools
- Dashboards, Running Trends
  - Reporting Engines: Tableau, Qlikview
- Data cubes
  - OLAP Databases: Tableau, Oracle
- UI (Optional)
  - User Interface: Web/Mobile Apps

Typical Analytical Project Phases



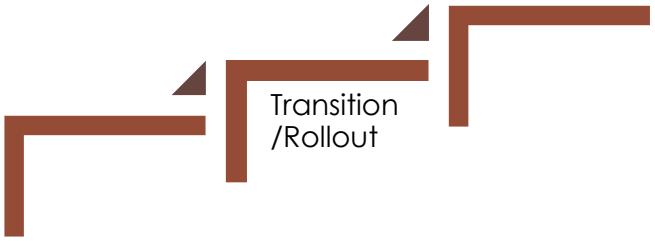
- A complex variety & hybrids of building blocks
- Must understand your requirements…

A Hybrid Framework



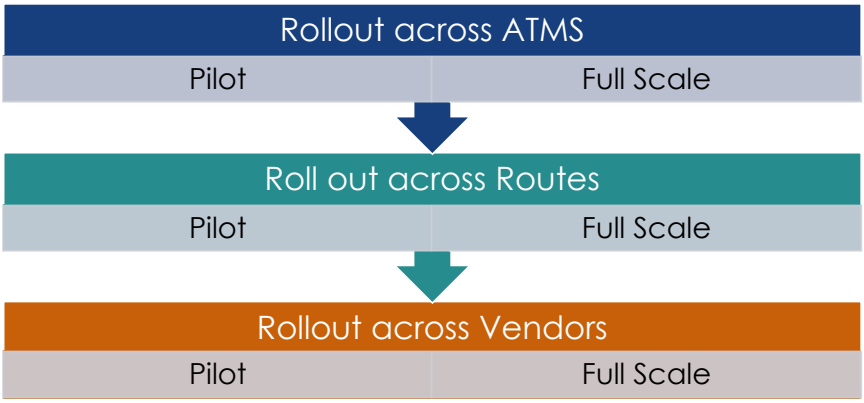
Source: Disciplined Agile Delivery, Scott W. Amber; Mark Lines

Deployment



Rollout Plan adds another layer of complexity

- Rollout is preferably done in a test and learn iteration



Champion
Challenger
Process

Deployment

Maintenance is an ongoing activity

- Models deteriorate over time
- Regular health checks can provide statistics on such deterioration

M1 Recalibration exercises might be required ANALYTICS

M2 Implementation software also would need its own maintenance DEVELOPMENT

Case Study: ATM Cash Replenishment

ATM cash replenishment challenge

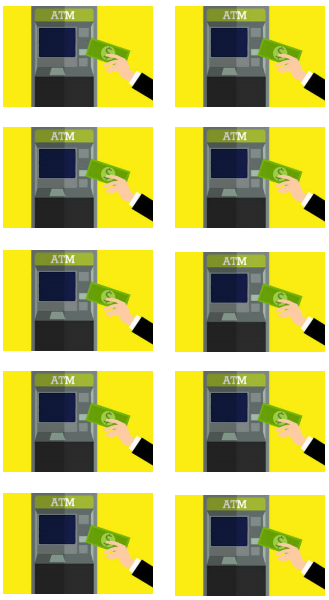
Post implementation Results

- ✓ Cash-outs down by 80 %
- ✓ Trips required to reload network down by 20 %
- ✓ Leftover cash returned to the bank decreased by 40 %

Underlying models

Predict Low Traffic

Predict Cash outs

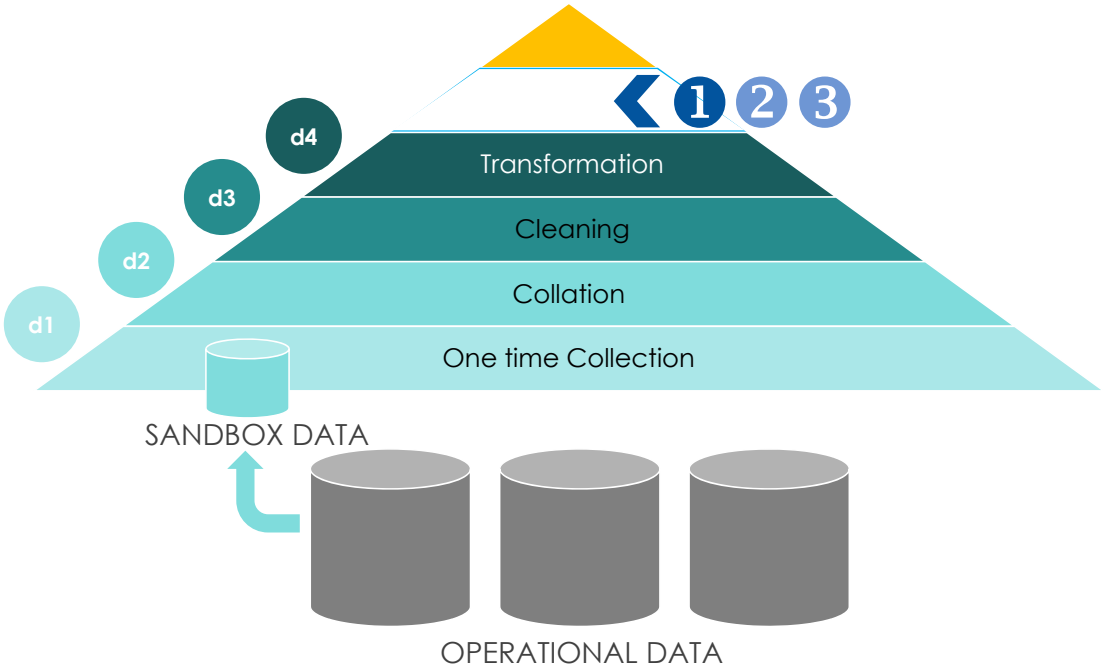


1100 ATMs = how many models?

1 2 3 4

- ✓ Model Traffic
- ✓ Model Cashouts
- ✓ Connect to Vendor System for automatic scheduling

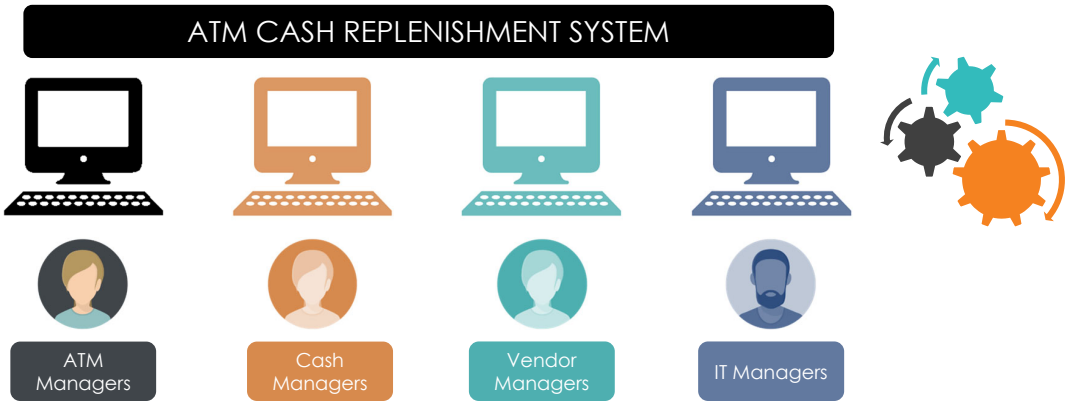
Data processing challenge: sandbox



Data processing challenge: development

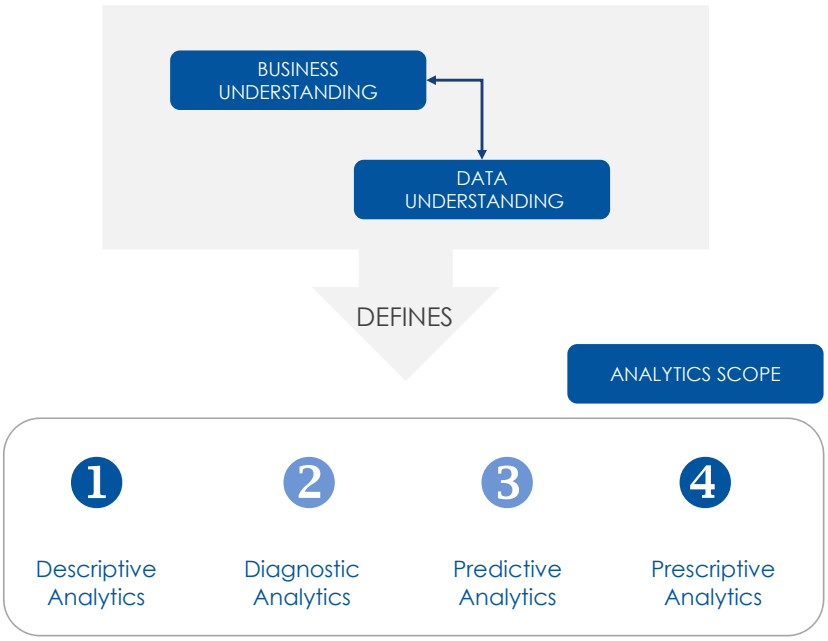
Development complexity depends on users involved

- Complexity depends on user interfaces required
- Different Managers could be in-charge of ATMs, Cash, Vendors and the IT system

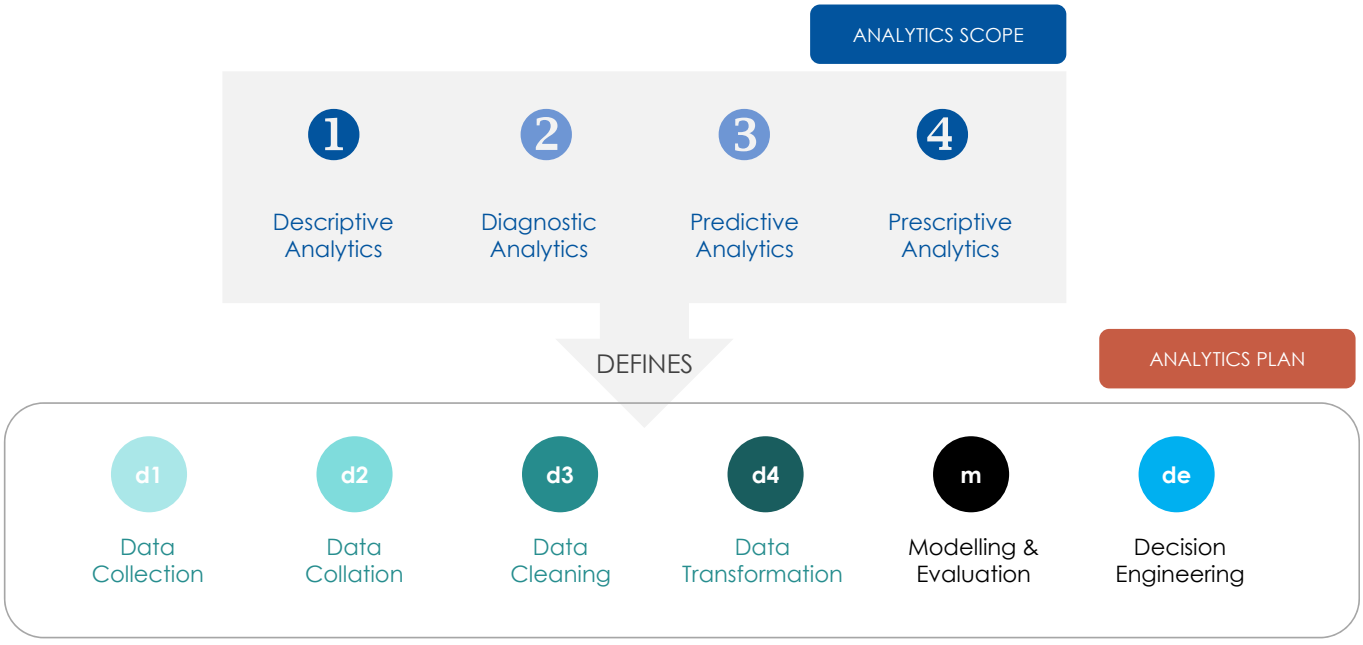


Analytics Project Scoping Considerations

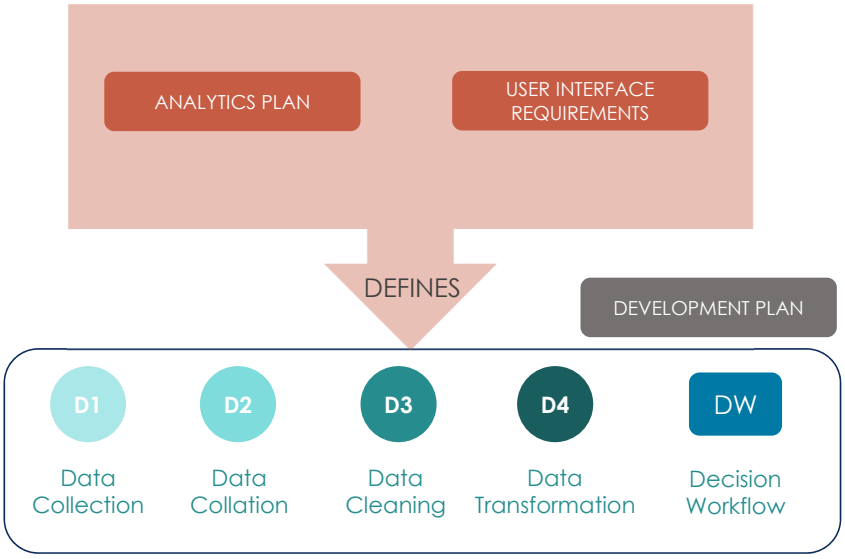
Project complexity: inception



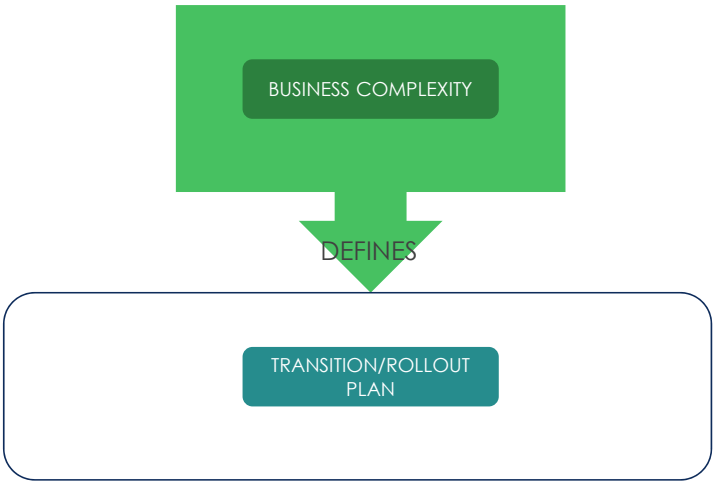
Project complexity: analytics



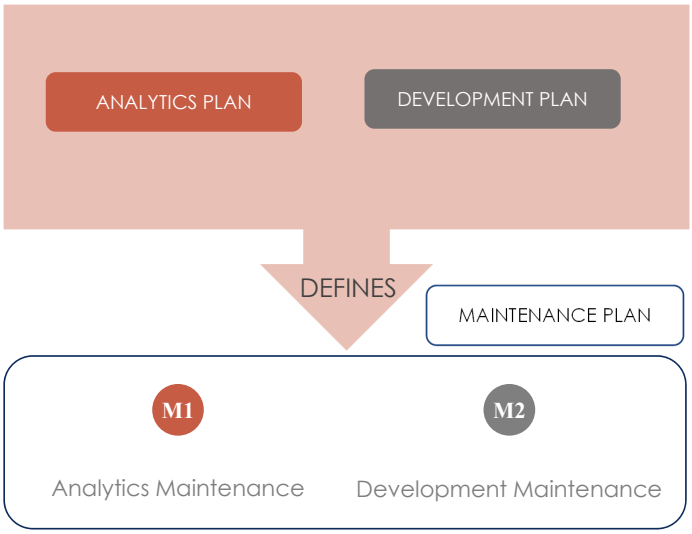
Project complexity: development



Project complexity: transition/rollout



Project complexity: maintenance



Question time

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