Pengantar Business & Data Analytics
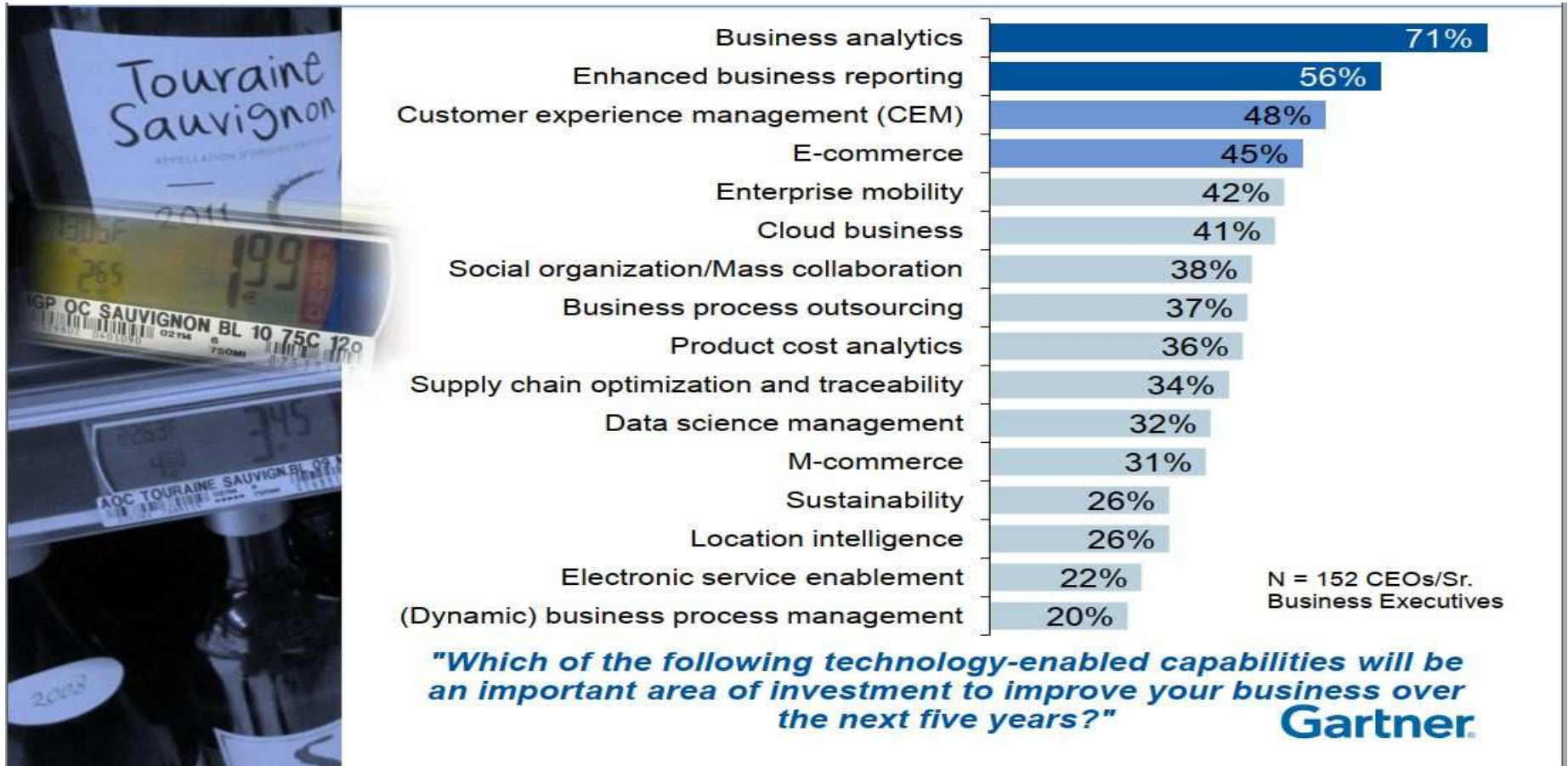
ASTRA HONDA MOTOR — FINANCE DIRECTORATE
JAKARTA, FEBRUARI 2019

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Where to Invest to Improve Business?

"Which of the following technology-enabled capabilities will be an important area of investment to improve your business over the next five years?"

Business analytics	71%
Enhanced business reporting	56%
Customer experience management (CEM)	48%
E-commerce	45%
Enterprise mobility	42%
Cloud business	41%
Social organization/Mass collaboration	38%
Business process outsourcing	37%
Product cost analytics	36%
Supply chain optimization and traceability	34%
Data science management	32%
M-commerce	31%
Sustainability	26%
Location intelligence	26%
Electronic service enablement	22%
(Dynamic) business process management	20%

N = 152 CEOs/Sr. Business Executives

Gartner.

Traditional Data Analyst

Report Example

4

Expanding Role of Data Analyst

Yesterday — Look Back

- **Descriptive Analytics** — *What has happened?*
- **Diagnostic Analytics** — *Why did it happen?*

Today — Look Across

- **Data Exploration** — *What new opportunities exist?*
- *What process can be improved?*
- **Discovery Analytics** — *What is happening right now?*

Future — Look Forward

- **Predictive Analytics** — *What is likely to happen?*
- **Prescriptive Analytics** — *What Should I do about it?*

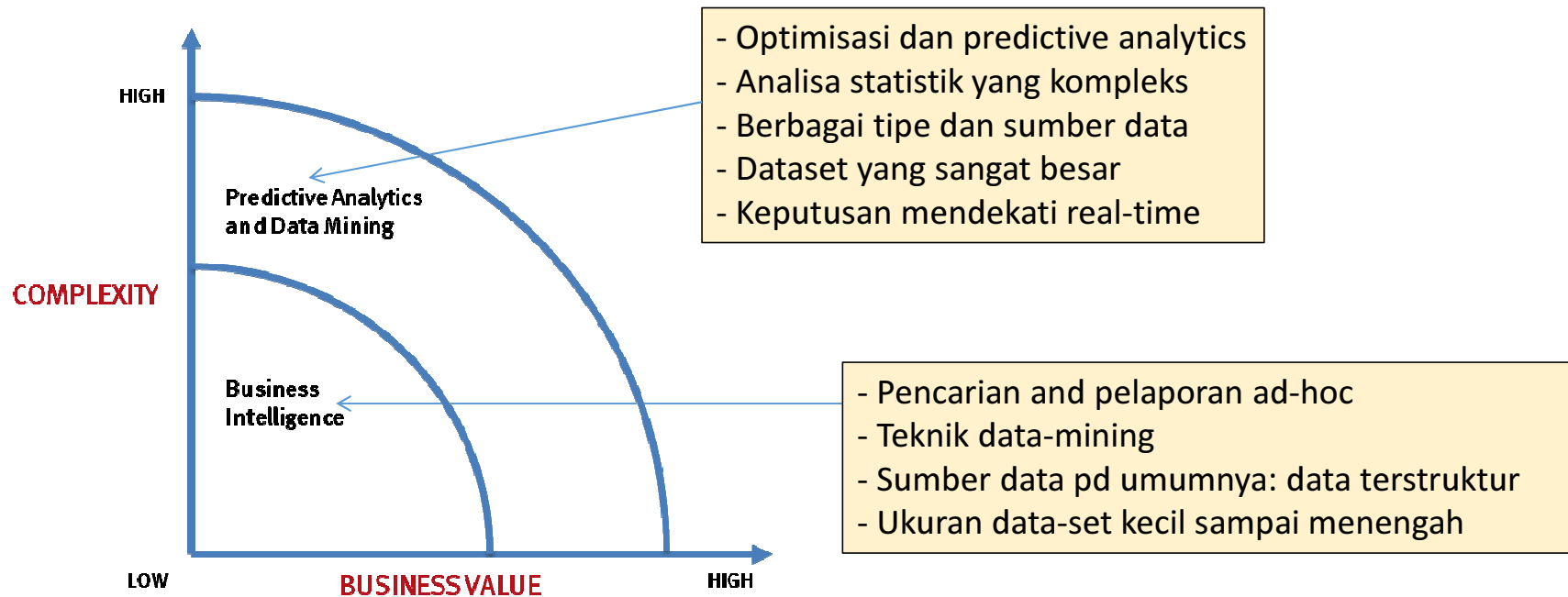# Towards Automated Decision
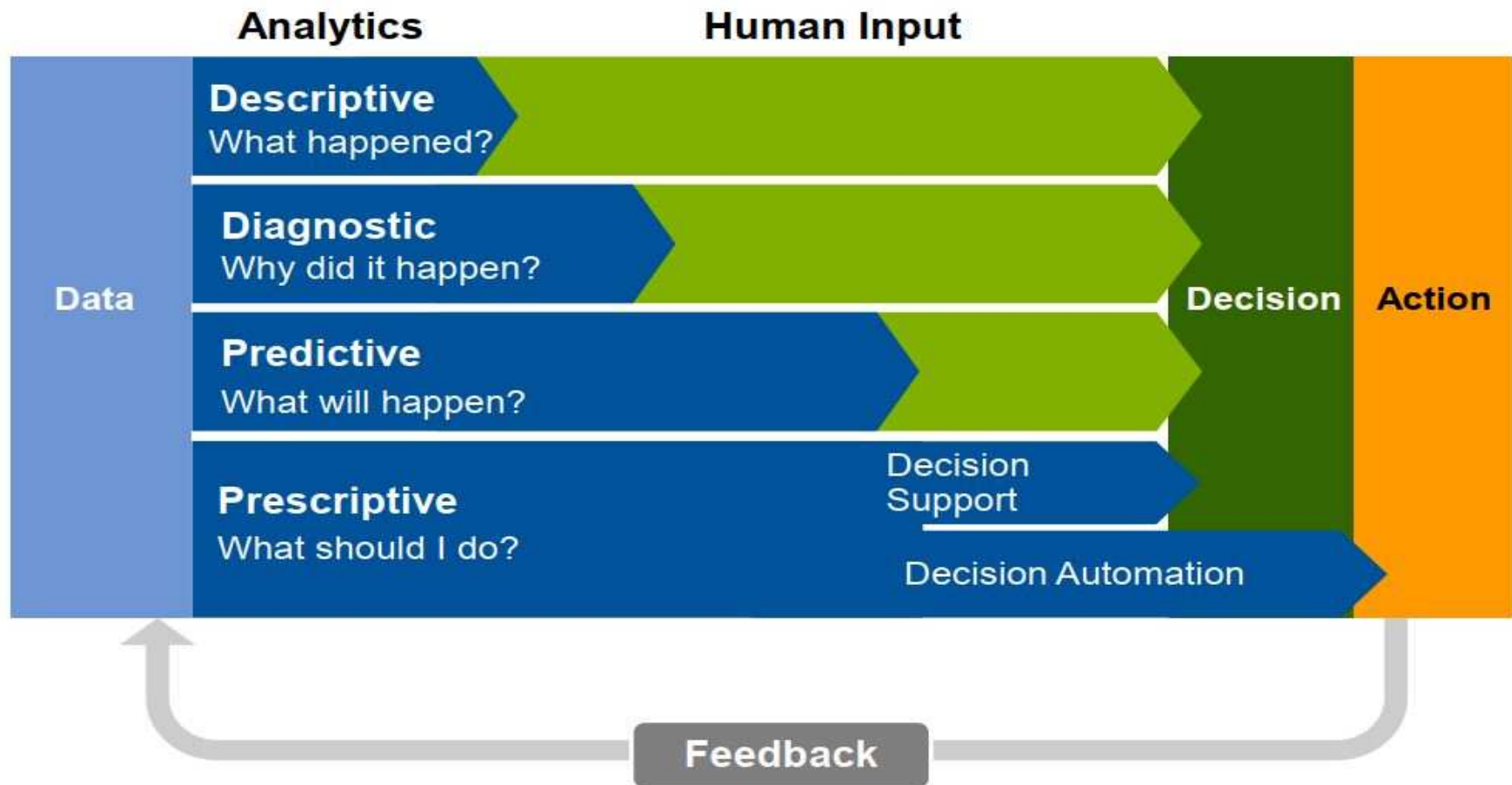
Intelligence vs. Analytics

Traditional BI
- Standard reports and dashboards
- Ad hoc reports – Current performance
- Query Drill down
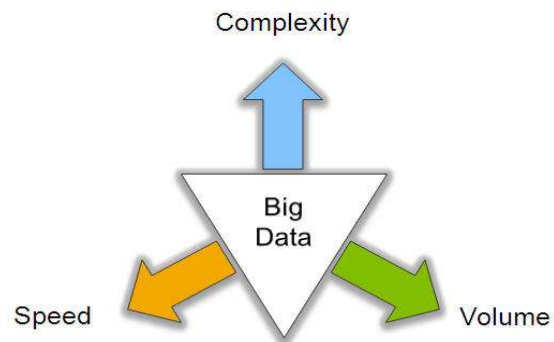- Cube analysis – Slice and dice
- Alerts

Vs.

Business Analytics
- Statistical Analysis
- Forecasting
- Predictive modeling
- Optimization

Intelligence vs Analytics

Data Landscape Today
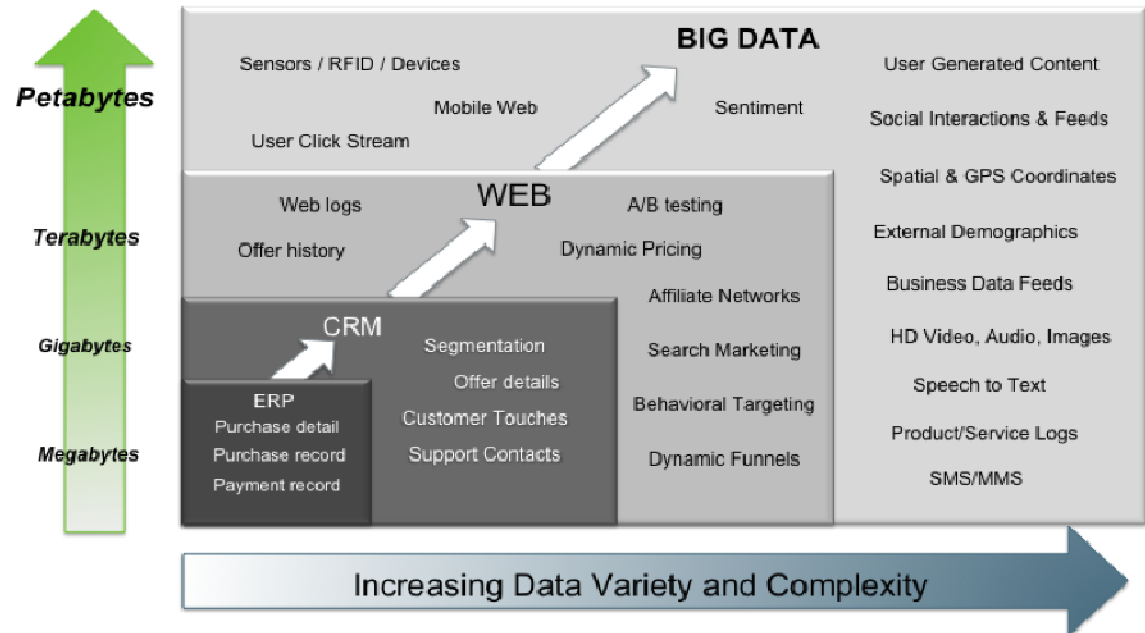
Economics of Data Analytics
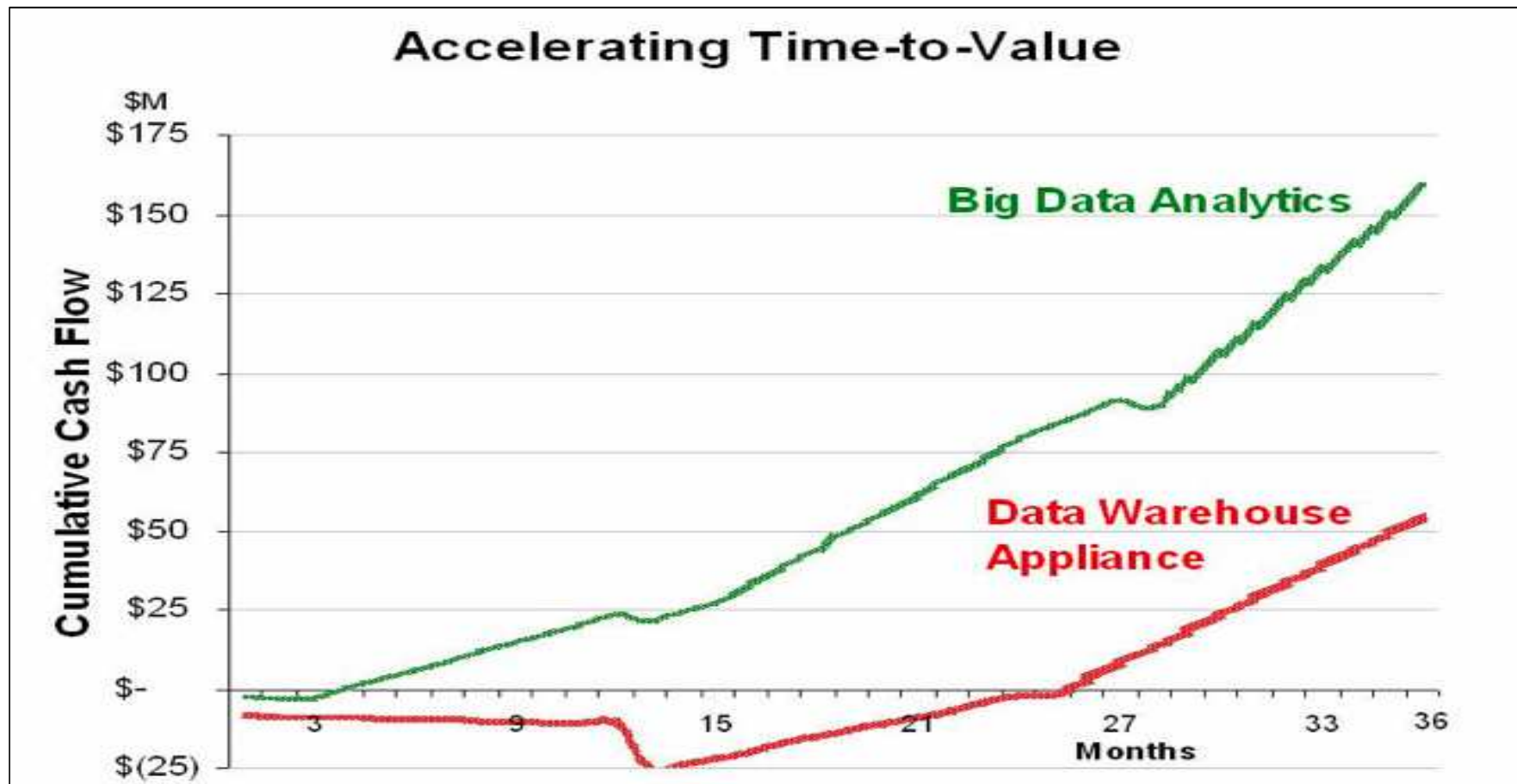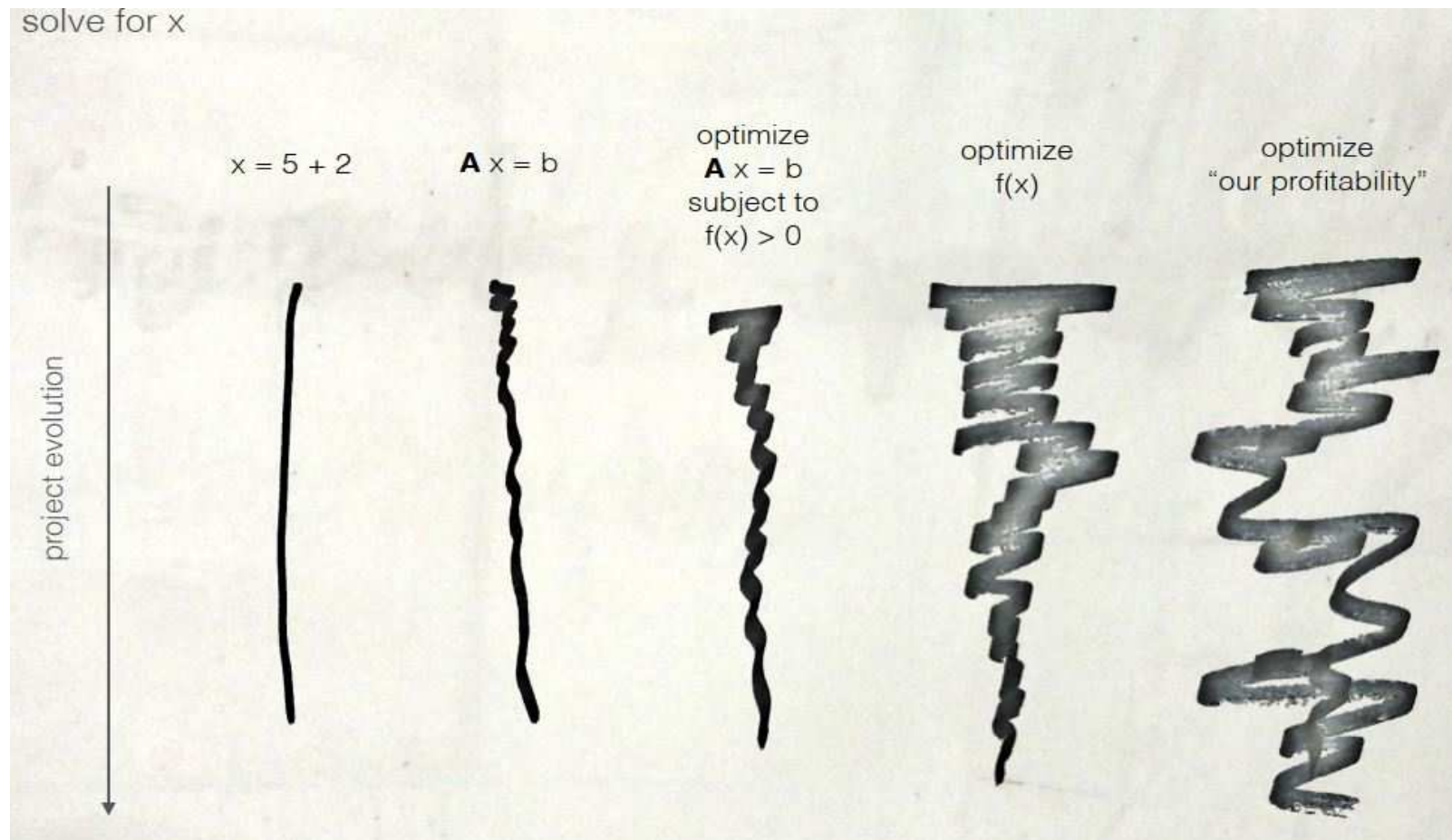
Beneficiary

1) Analytics for Humans

- Another **human is the final decision maker** and consumer of the analysis

- Must be **comfortable coming to higher-level conclusions – the "why" and "how"**

- Telling a story from the data

Beneficiary

2) Analytics for Machines

- The **final decision maker** and consumer of the analysis **is a computer**
- Creating computer **algorithms and models**
- **Their digital models are established and then act on their own**
    - automatically trade in the stock market
    - Decide ads to display for online content/advertising targeting, or
    - Personalized product recommendations
- must have remarkably **strong mathematical, computational, and statistical skills and data modelling**
- So that systems can make quality predictions quickly.
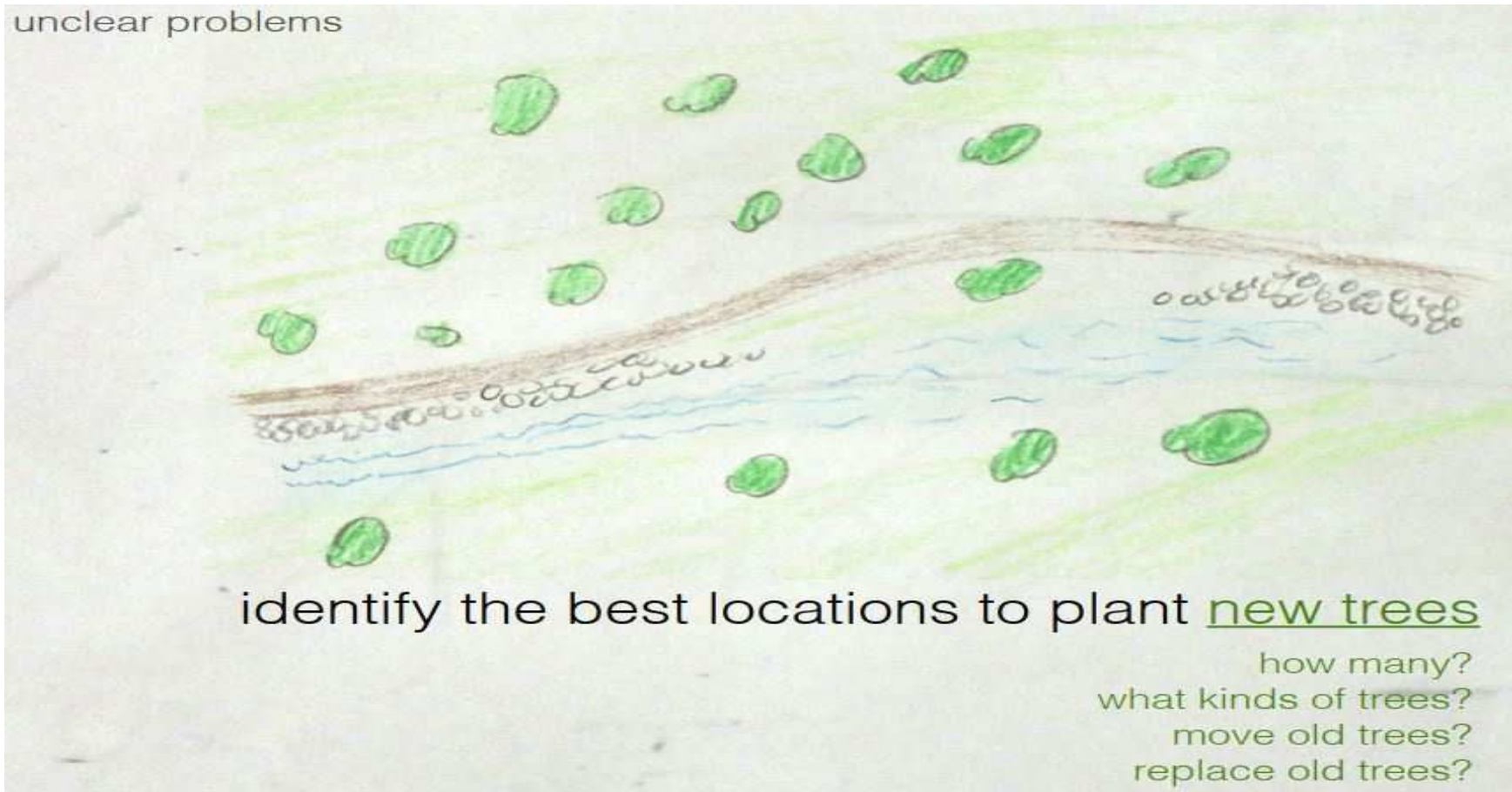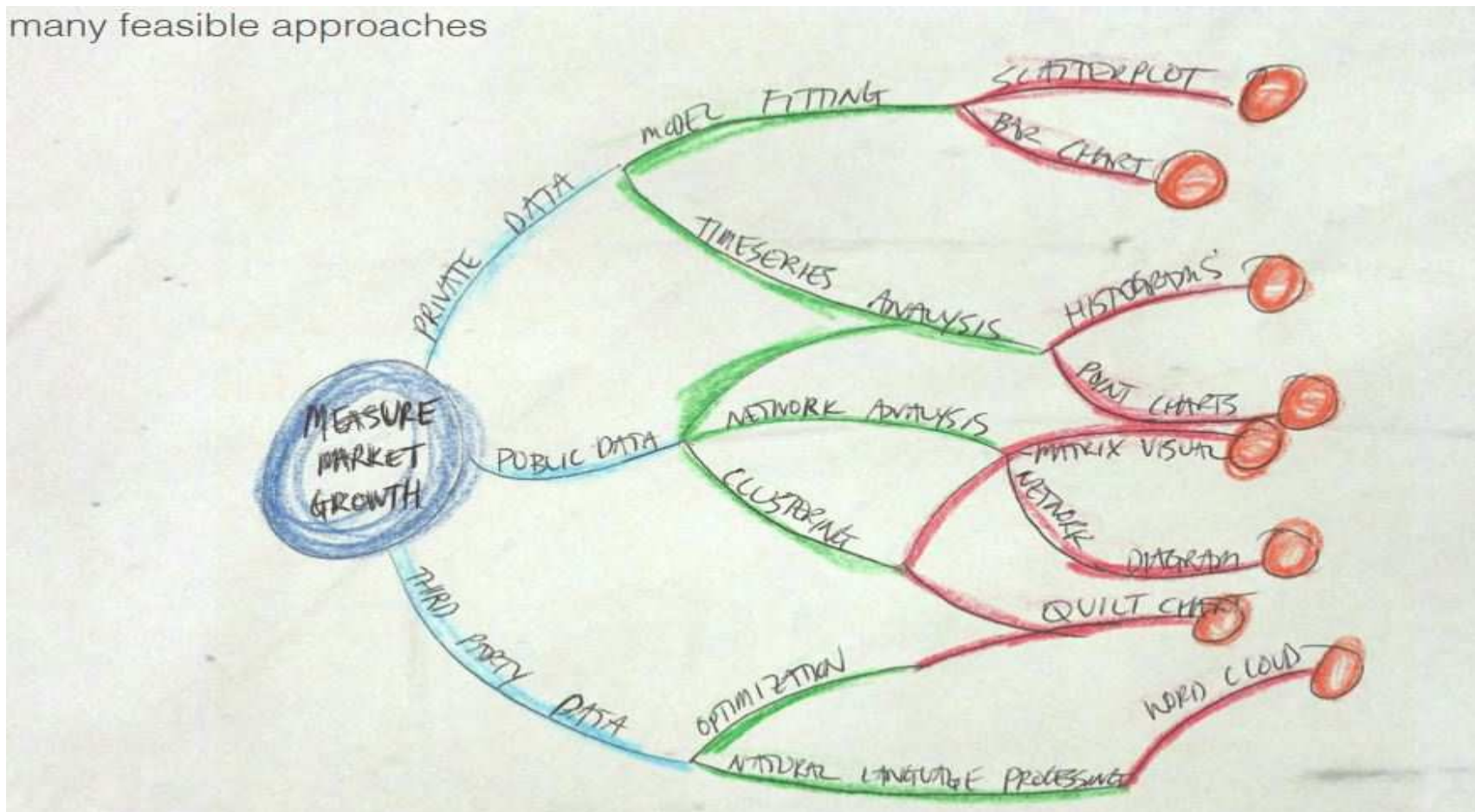
Typical Problem to Solve

Problem Type

unclear problems

identify the best locations to plant <u>new trees</u>

how many?
what kinds of trees?
move old trees?
replace old trees?

Type of Approach

many feasible approaches

Thinking Guidelines

- **Context:** What are you trying to achieve? Who is invested in the project's results? Are there any larger goals or deadlines that can help prioritize the project?

- **Need:** What specific needs could be addressed by intelligently using data? What will this project accomplish that was impossible before?

- **Vision:** What will meeting the need with data look like? Is it possible to mock up the final result? What is the logic behind the solution?

- **Outcome:** How and by whom will the result be used and integrated into the company? How will the success of the project be measured?

Analytics Process

human-centered design
lean startup
agile programming

generate hypotheses

personas, scenarios, use cases
business/product requirements
story/user cards

evaluate feedback

1-4 week iterations

build prototype

A   B

surveys, interviews, focus groups
split testing, A/B testing
QA; requirements churn

build device prototypes
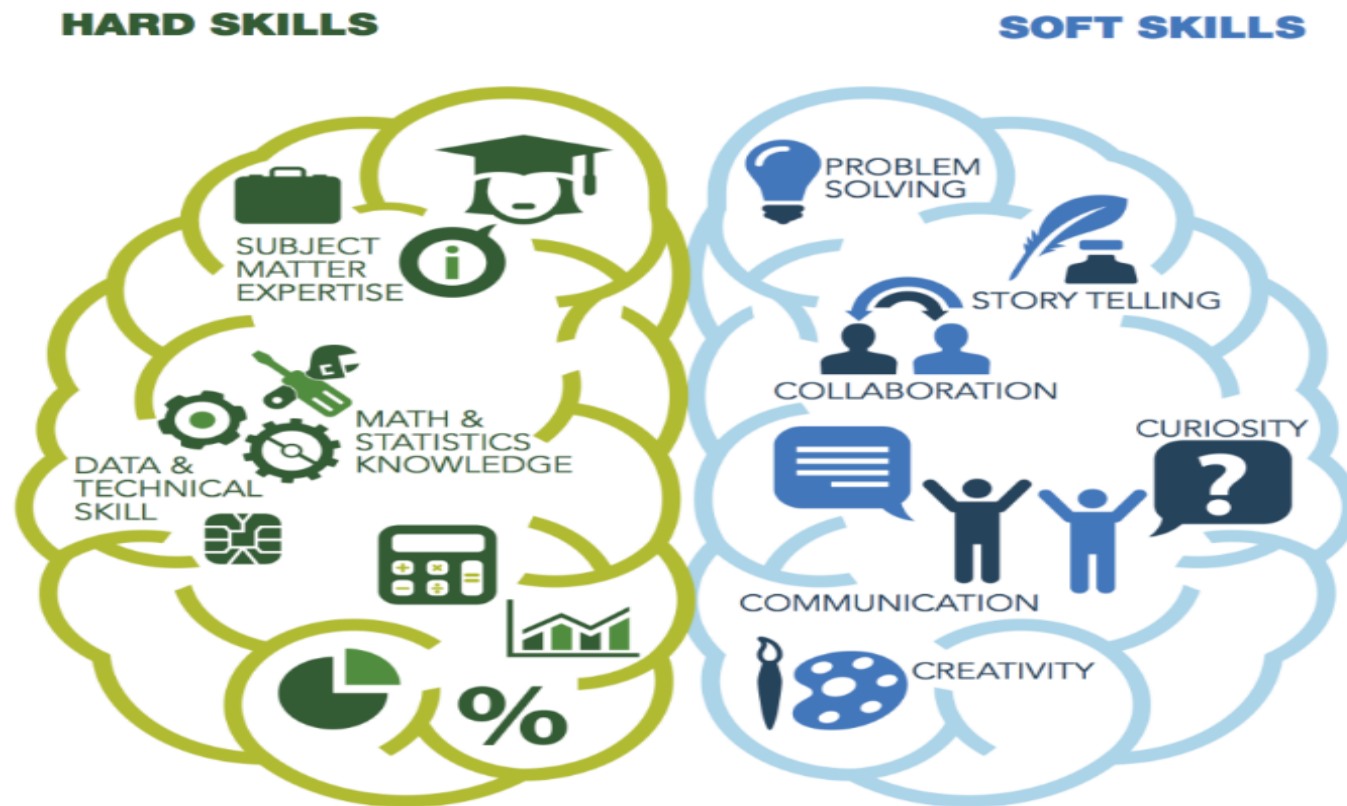minimum viable product
write code
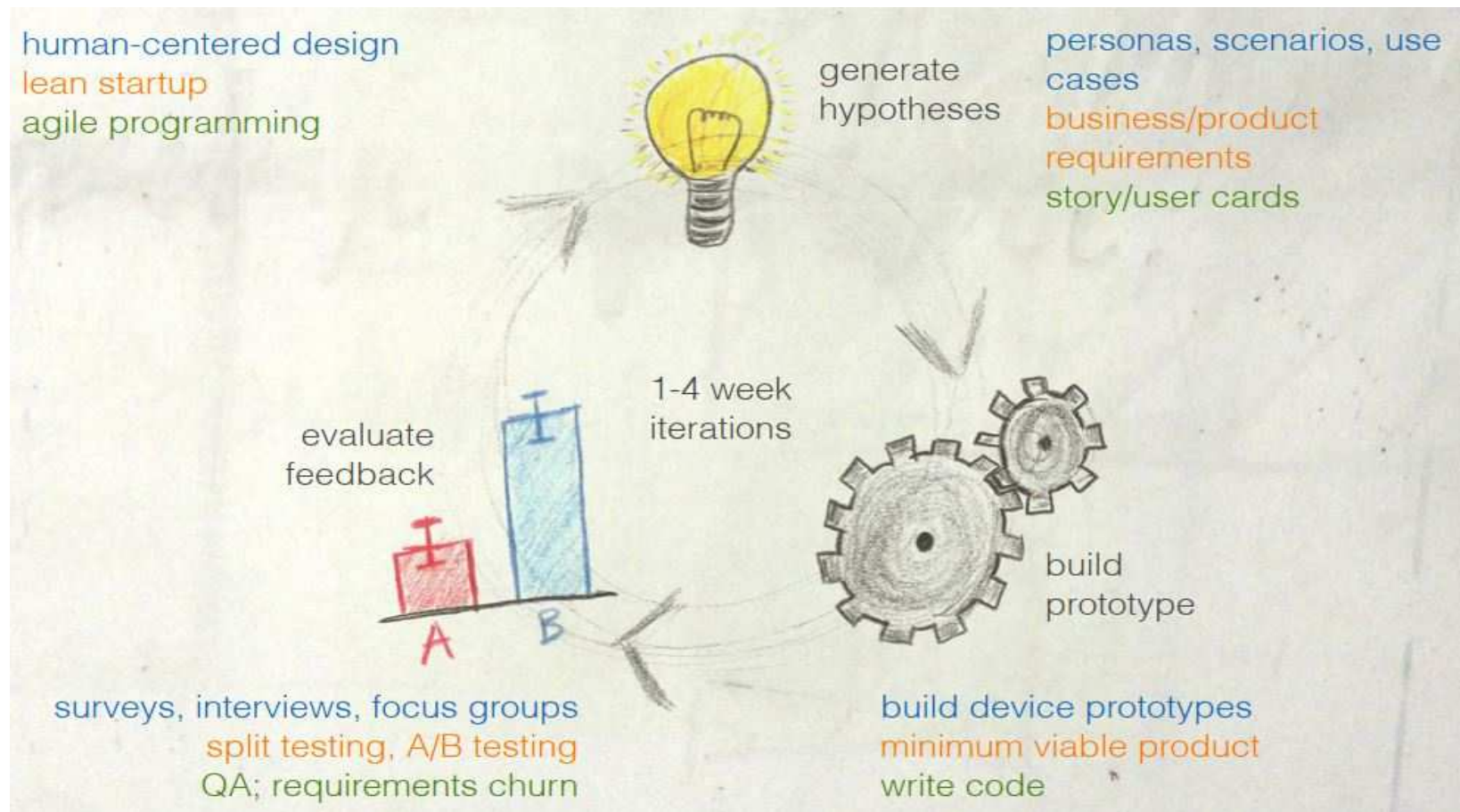
Analytics Talent

1. People who love data (slice and dice it)
2. Able to communicate effectively with people and good presentation skills.
3. Knowledge and experienced
4. A working knowledge of the most commonly used programming languages for analyzing large digital datasets
5. Insight competence

Hard vs Soft Skills

Program Training Digital Innovation & Data Analytics

| Topic	Module		Duration
Introduction To Data Analytics & Innovation	Modul 1	Building Blocks	120 minutes
	Modul 2	Data Structure	120 minutes
	Modul 3	Application Structure	120 minutes
	Modul 4	Data Analysis	120 minutes
Data Visualization	Modul 5	Conceptual Framework for Data Visualization	120 minutes
	Modul 6	Basic Charting	120 minutes
	Modul 7	Intermediate Charting	120 minutes
	Modul 8	Applied Visualizations	120 minutes
Quantitative Analysis	Modul 9	Practical Statistics	120 minutes
	Modul 10	Modeling	120 minutes
	Modul 11	Data Science I	120 minutes
	Modul 12	Data Science II	120 minutes
Problem Solving	Modul 13	Problem solving Framework in Data Science	120 minutes
	Modul 14	Case 1: Driving Visual Analysis with Automobile Data	120 minutes
	Modul 15	Case 2: Stock Investment Analysis	120 minutes
	Modul 16	Case 3: Predicting Customer Churn	120 minutes
Mental Readiness	Modul 17	Pengantar Business & Data Analytics	120 minutes
	Modul 18	TBD	120 minutes
	Modul 19	TBD	120 minutes
	Modul 20	TBD	120 minutes

Teaser: Find Sample Size

$$\text{Sample size} = \frac{\dfrac{z^2 \times p\,(1-p)}{e^2}}{1 + \left(\dfrac{z^2 \times p\,(1-p)}{e^2 N}\right)}$$

N = population size • e = Margin of error (percentage in decimal form) • z = z-score

Population size	Confidence level = 95% Margin of error			Confidence level = 99% Margin of error		
	5%	2,5%	1%	5%	2,5%	1%
100	80	94	99	87	96	99
500	217	377	475	285	421	485
1.000	278	606	906	399	727	943
10.000	370	1.332	4.899	622	2.098	6.239
100.000	383	1.513	8.762	659	2.585	14.227
500.000	384	1.532	9.423	663	2.640	16.055
1.000.000	384	1.534	9.512	663	2.647	16.317

Tools
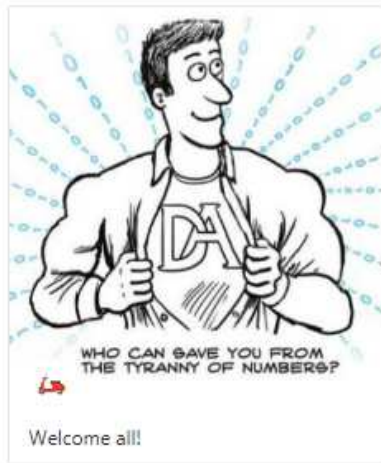
digital-analyst
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- https://github.com/digital-analyst/business_data_analytics_training

- Set up Google account to access and https://colab.research.google.com

- Internet access

Terima kasih!

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