

# Basics of Business Intelligence (BI) and Data Management (Part1)

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# Our Pain Points

- Fund Collection Issues, Invoice Payment delays, Customer Payment Indexing, ...
- Inventory Issues, Asset Values, Asset Selling, Asset Purchasing Criteria, Asset Status,...
- Customer Feedbacks...Analysis on Trend and Causes
- Customers asking for innovations, Customers asking for online reports
- Regulatory Asking for CRM access
- Reporting is Ad-hoc (Salary, Costs, Bank accounts, ..)
- How much is Efficiency of Sat BW usage
- How much is the costs of each customer, How much is its value?
- e.g. Secretariate, what if this guy left us? Staff dependency?
- Knowledge base? How do you store your know-how?
- How do you measure your team/staff performance?
- Do your staff misguide and mislead you on their data?
- How much is resilient and sustainable your organization in terms of data and staff?

# Topics

- New Digital Age
- DX requirements

DX: Motives and Enablers to BI



- Data Strategy
- DM Culture
- Data Literacy
- DM Governance
- DM technology

Data-Driven Organization



- Data Management basics
- DMBOK Framework
- DAMA Wheel

A glance to DMBOK2



- Why BI?
- Common Myths on BI
- How BI works?

What is BI?



- BI Tools features
- Market leaders
- MS Power BI

An overview to BI Tools



- Steps to implement BI

BI Implementation



- Plans
- Challenges
- Outcomes
- Demo

ICASAT BI case study

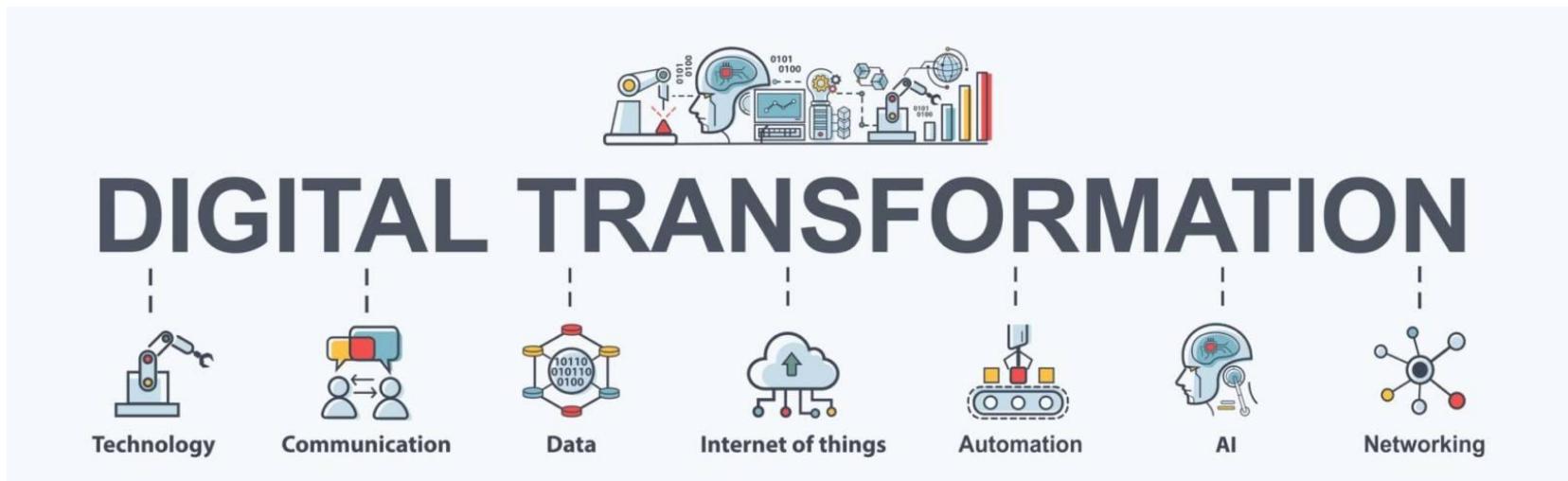


- Summary
- Any Question?

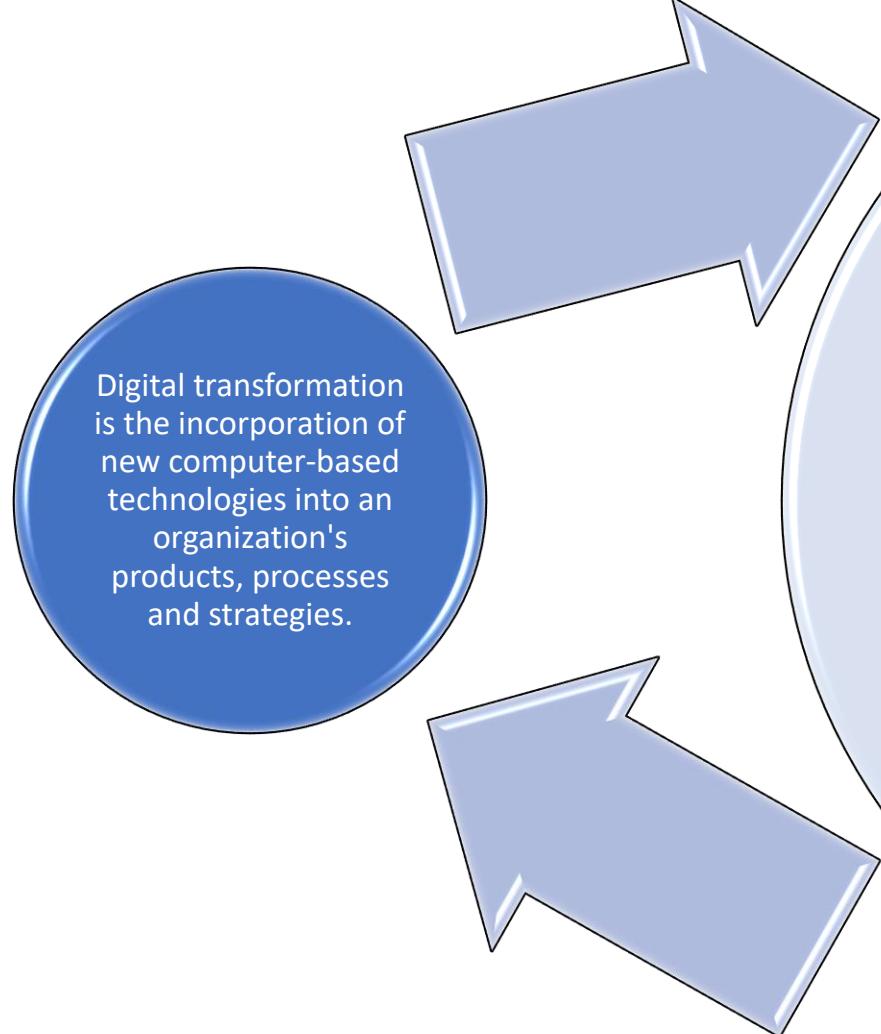
Q&A



# DX: Enabler for BI



# What is DX (Digital Transformation)?



We are at the age of DX (Next Digital Universe); **Digital Game Players:**

- Cloud solutions: DC-> IaaS/PaaS/SaaS/Desktop-> Enterprise (private cloud)-> Edge -> Public Cloud)/Hybrid/Multi-Cloud/
  - ST Engineering: Idirect + NewTech & Comtec + UHP Romantis → New VSAT Hub is cloud-based!/Multi-Orbit (GEO/MEO/LEO)
- Connectivity: 5G/6G/Mobile standards/WiFi6/WiFi6E/WiFi7/LoRaWAN
- Block chain: DeFi/Crypto/NFT/(VARA in Dubai, Virtual Assets Regulatory Authority)
- AI/ML/DL/Intuitive AI/Conversational AI/NLP/Vision/Robots/Robotics/AIoT
- Data Science/Big Data/Data Analytics/MIDS degree
- AR/VR (augmented reality/virtual reality)
- X-verse: Metaverse/Gaming/Web 3/UAE vision: top 10 cities in Metaverse economy/attract 5000 metaverse companies in 5Y (Healthcare, manufacturing, education, retail, future of work, gaming)
- Remote Working/WFH/Emirates: 42000 virtual Jobs by 2030 for \$4Billion
- New IT/IS management best practices: Agile/DevOps/DevSec/CI-CD/DataOps/MLOps/New Job functions/Kubernetes/100,000 Golden Visa by UAE for top coders!//
- Low-code, No-code/focus on customer and employee experiences
- SDN (software defined networks)/A case on VSAT last year in CABSAT/SDSN: SpaceBridge
- Adopting API framework (delivering data securely)
- IoT/IoT/AIoT/Smart Home/Smart City/Industry 4.0/Digital Twins/Drones/UAV/
- Digital economy/Digital smart cities/Autonomous vehicles/Future Mobility(flying taxis)/Health Care/Fintec/Energy/Education/Data economy/CX
- BI/RPA/cybersecurity/edge computing

• **The Demand is Changing to Digital Innovation**

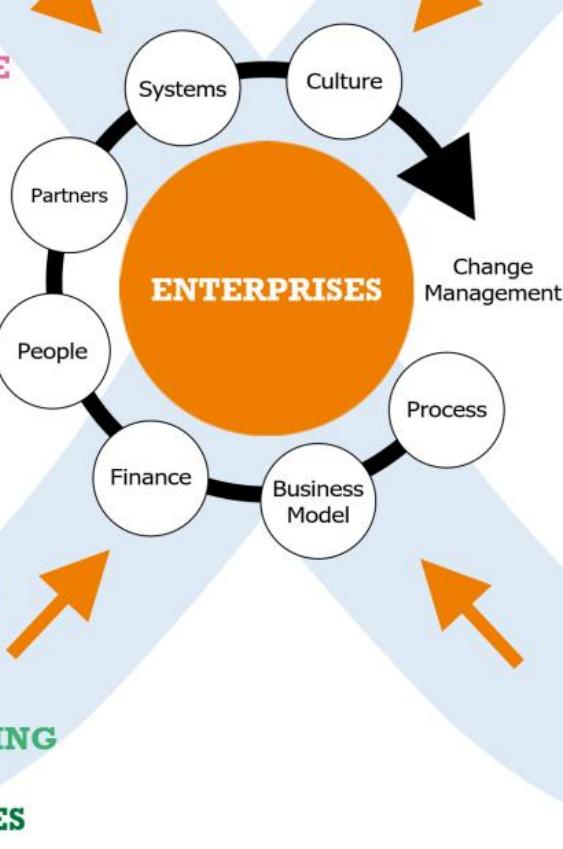
# DIGITAL TRANSFORMATION

## TECHNOLOGIES

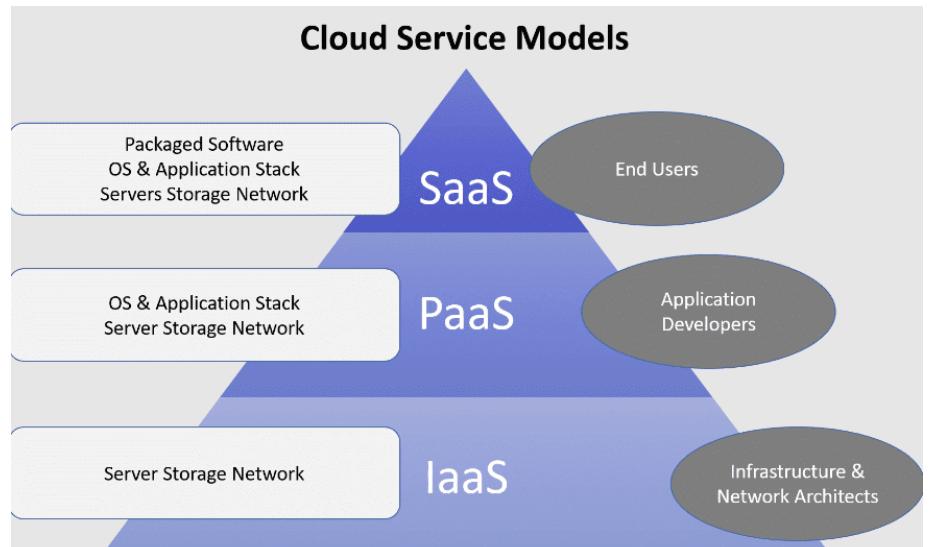
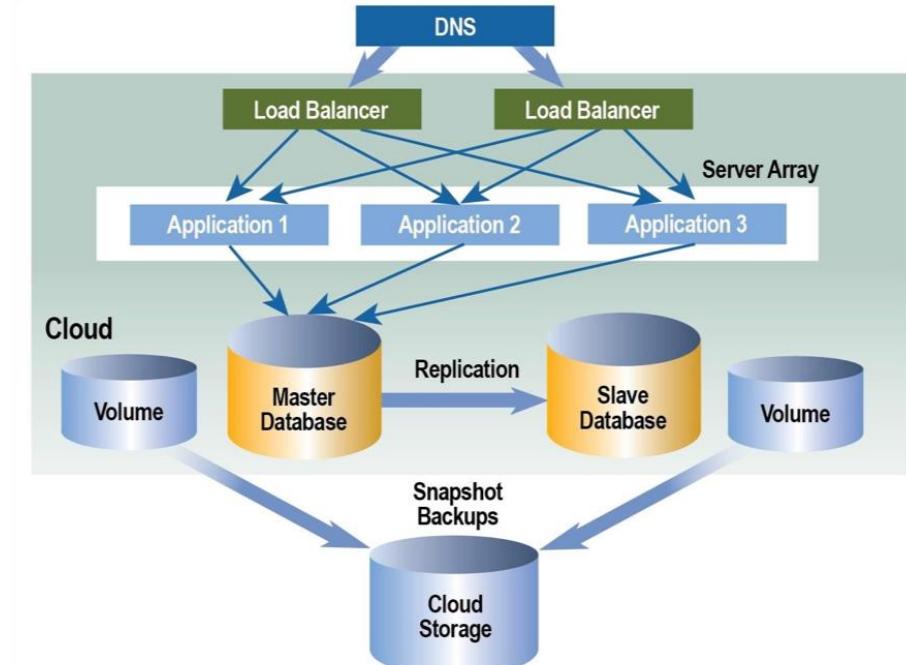
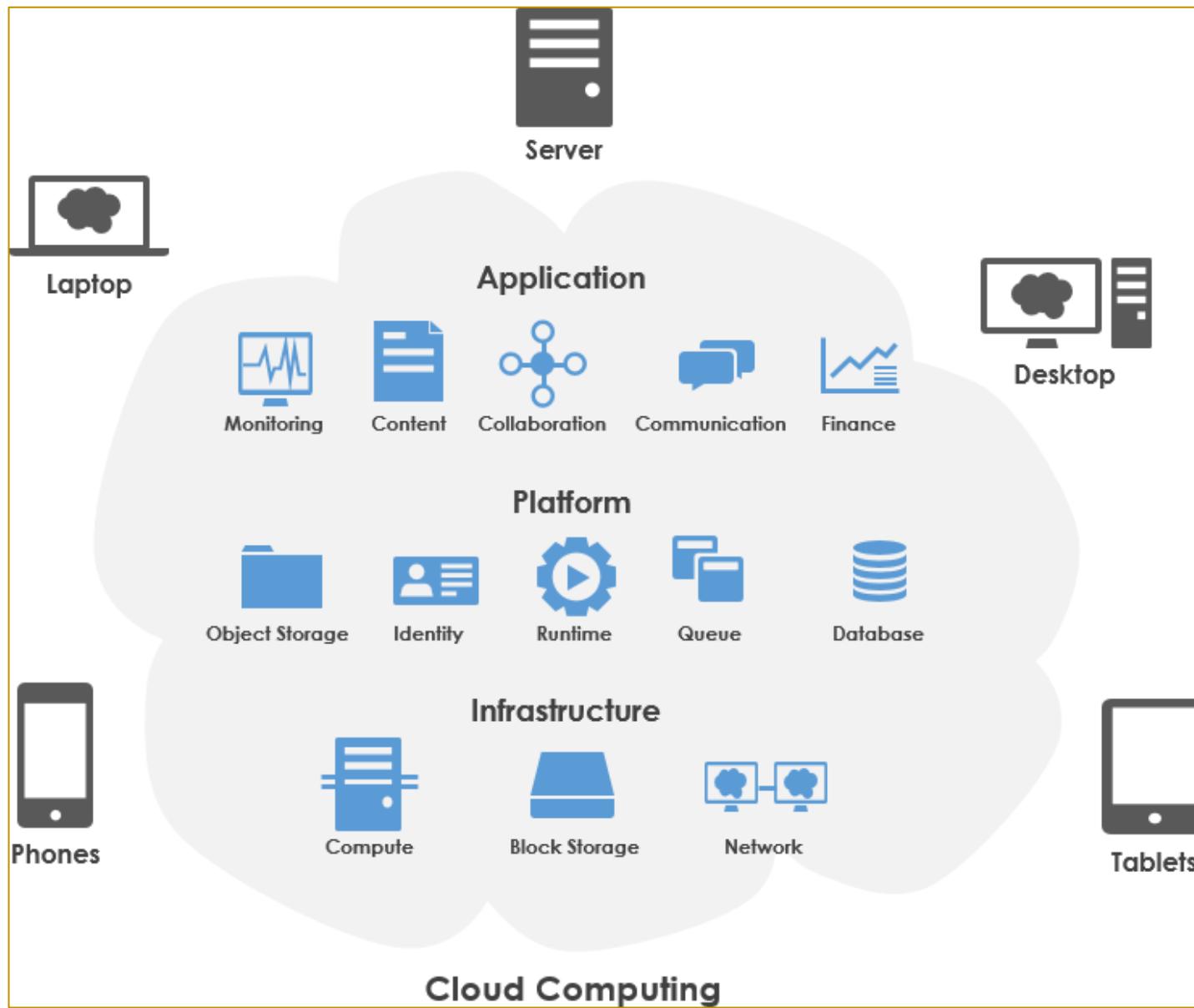


## TRANSFORMA INSIGHTS

transformainsights.com



# Cloud Service Model



# Benefits of DX (Digital Transformation)

Increased efficiency and productivity

Better resource management

More resiliency

Greater agility

Improved customer engagement

Increased responsiveness

Greater innovation

Faster time to market

Increased revenue

Continued relevancy

# What DX bring us?

Should sync with this global fast track journey

Customers are asking and chasing DX innovations

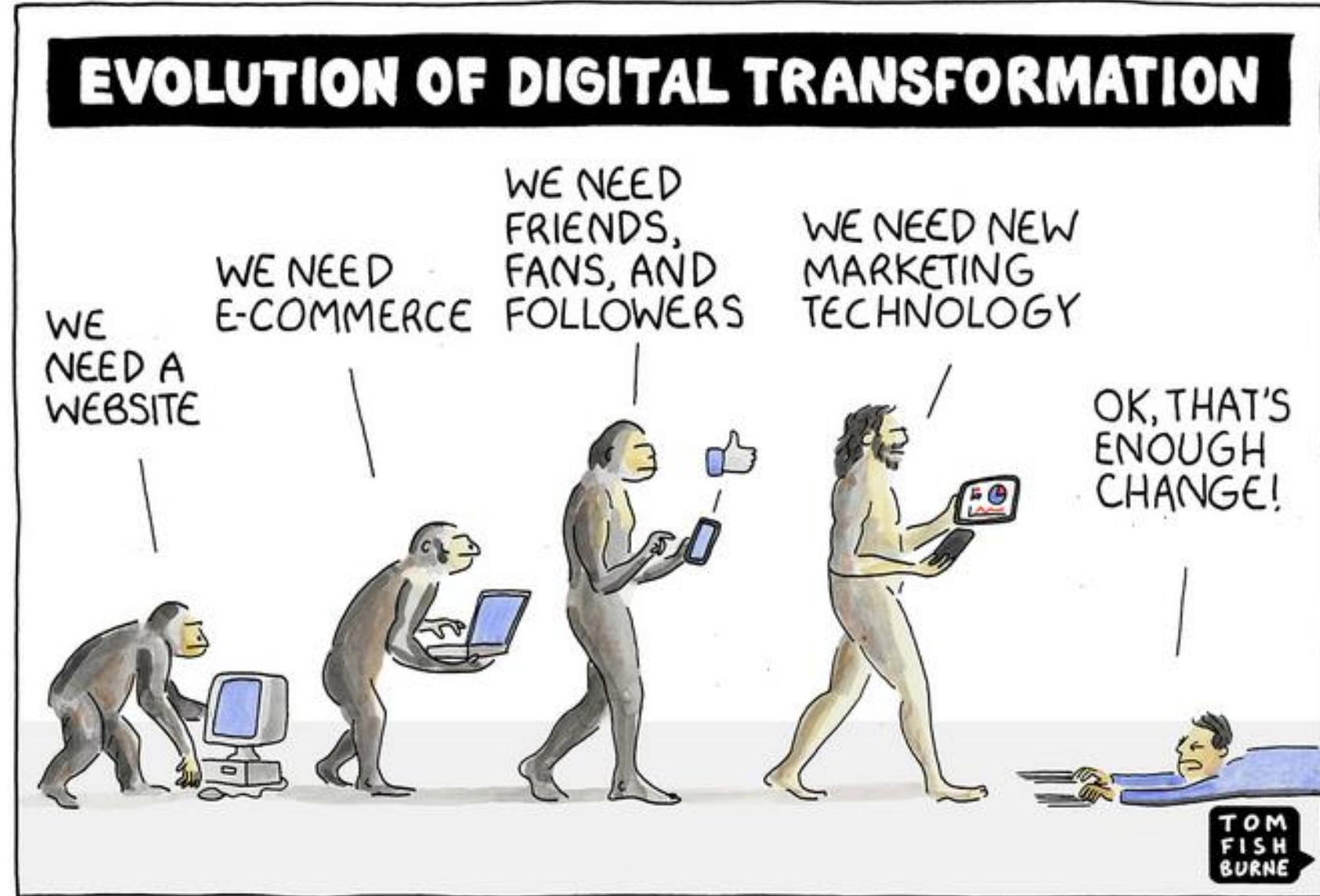
Should not lag the competitors

Should decide on any changes needed in the organization

- New business opportunities
- New Strategies
- Digital Culture
- Improved Processes
- Digital-literate peoples and hires
- Considering New technologies
- Planning New IT/IS solutions

Digital Age and DX relies totally on “DATA”

So big impact:  
DX is a key driver guiding broad Data Strategy and Data Management goals and activities  
Shall think “Data-driven” on all these levels  
• Should Setup a Data-Driven Organization





# Data-Driven Organization

“Without Data you’re just another person with an opinion”

W. Edwards Deming, Data Scientist



# Data-Driven companies

## What does a manager do?

- Controlling and exploiting the best out of its assets

## Assets

- Physical assets
  - Hub, modems, routers, BW, .. Inventory, staff, time, ...
- Virtual assets
  - Licenses, reputation, time, .. AND **Data**

## Work flows ->generates Data flows

## Data Hierarchy (data/information/knowledge->Wisdom)

- Informed decisions via High quality data

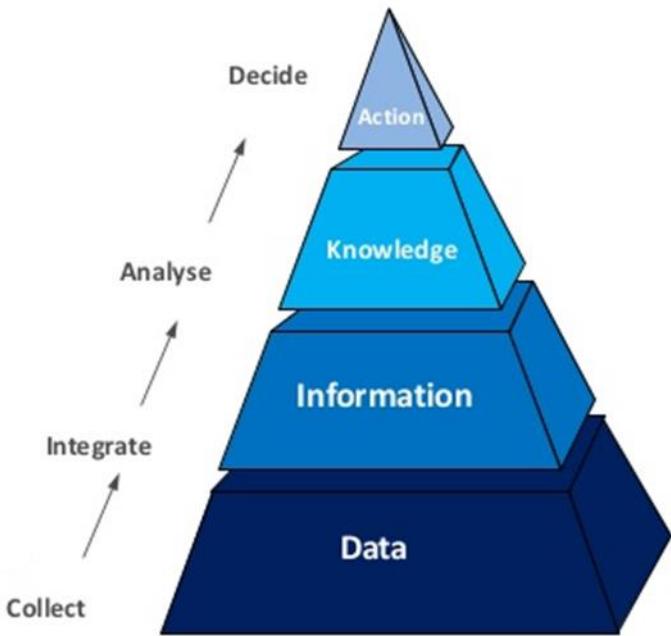
## Poor or low quality data

- Inhibits integration
- misguides analyze
- Failure to decide
- Blockage to action

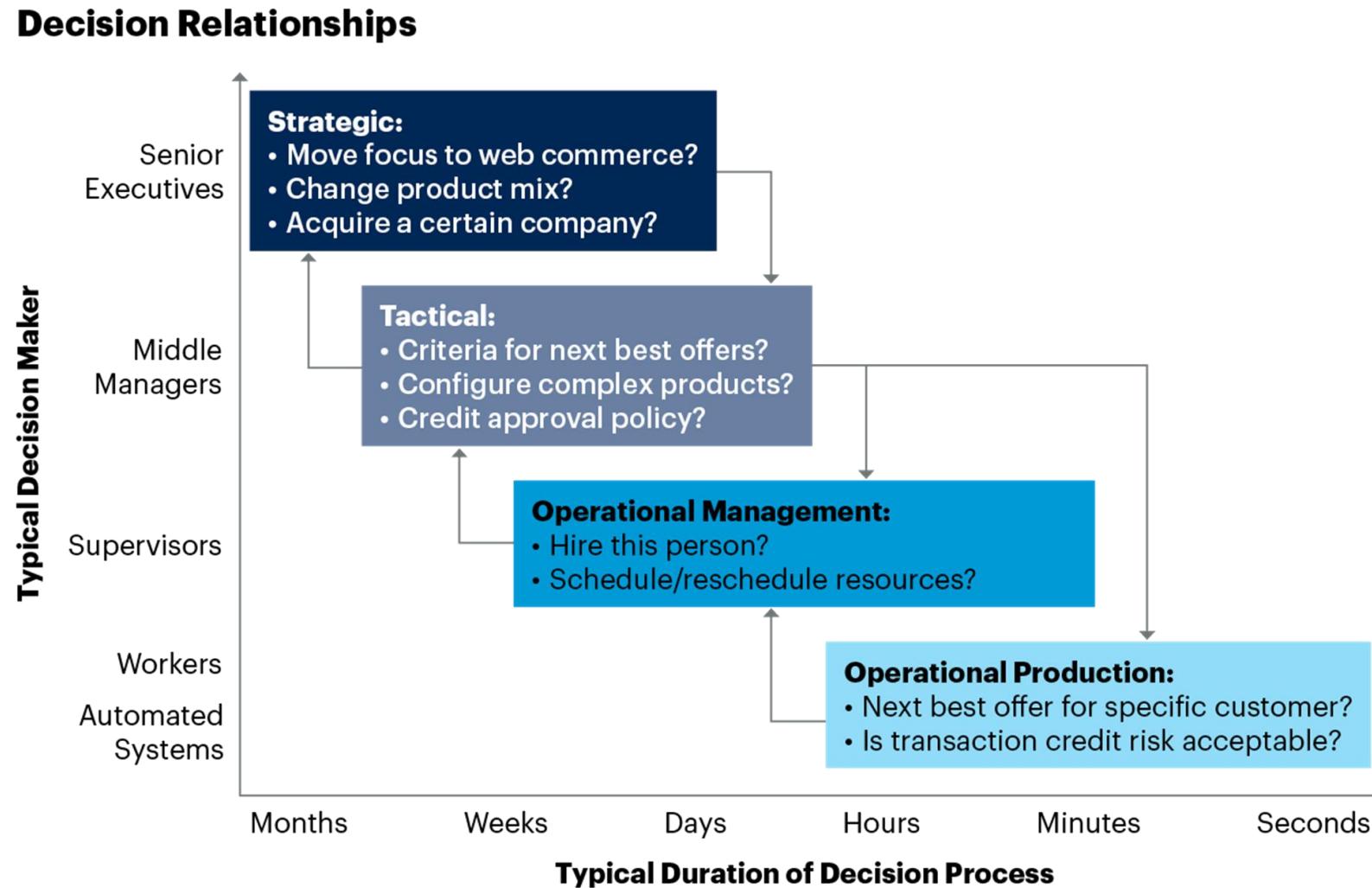
## So What does a manager do?

- Deciding (by deriving value from data) and Acting
- Work flow-> Data flow -> (data -> insight -> decide -> action) -> (improve) work flow (Cycle)

There is a strong need to do Data Management (BI is part of DM)



# Decision Making Levels



Source: Gartner

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# Data-Driven companies

## At which DATA (Management) level our organization resides?

- Data Strategy?
- Data Culture?
- Data Governance?
  - Authority, control, decision-making on managing data assets
  - Data governance is the process of organizing, securing, managing, and presenting data using methods and technologies that ensure it remains correct, consistent, and accessible to verified users
- Data Architecture
  - A pillar of digital transformation, connects business strategy and technical execution
- Data Modeling
  - Documenting the core business rules and relations around data
- Data technology? Data warehouse?
- Data quality?
  - Data quality is the degree to which data is accurate, complete, timely, and consistent with your business's requirements
- Data literacy?
  - Data literacy ensures all data users within an organization are educated to a level that enables them to consume data with confidence within a specific business context
- Data Security? Privacy?
- Data Access? (visibility)

## Data Usage? Do we Derive value? (informed Decisions or Daily operations?)

## What is our “Data Maturity level” in organization/enterprise?

# Data Maturity Model

Level 1 Basic	Level 2 Opportunistic	Level 3 Systematic	Level 4 Differentiating	Level 5 Transformational
<ul style="list-style-type: none"><li>▪ Data is not exploited, it is used</li><li>▪ D&amp;A is managed in silos</li><li>▪ People argue about whose data is correct</li></ul>	<ul style="list-style-type: none"><li>▪ IT attempts to formalize information availability requirements</li><li>▪ Progress is hampered by culture; inconsistent incentives</li></ul>	<ul style="list-style-type: none"><li>▪ Different content types are still treated differently</li><li>▪ Strategy and vision formed (five pages)</li></ul>	<ul style="list-style-type: none"><li>▪ Executives champion and communicate best practices</li></ul>	<ul style="list-style-type: none"><li>▪ D&amp;A is central to business strategy</li></ul>
<ul style="list-style-type: none"><li>▪ Analysis is ad hoc</li><li>▪ Spreadsheet and information firefighting</li><li>▪ Transactional</li></ul>	<ul style="list-style-type: none"><li>▪ Organizational barriers and lack of leadership</li><li>▪ Strategy is over 100 pages; not business-relevant</li><li>▪ Data quality and insight efforts, but still in silos</li></ul>	<ul style="list-style-type: none"><li>▪ Agile emerges</li><li>▪ Exogenous data sources are readily integrated</li><li>▪ Business executives become D&amp;A champions</li></ul>	<ul style="list-style-type: none"><li>▪ Business-led/ driven, with CDO</li><li>▪ D&amp;A is an indispensable fuel for performance and innovation, and linked across programs</li><li>▪ Program mgmt.. mentality for ongoing synergy</li><li>▪ Link to outcome and data used for ROI</li></ul>	<ul style="list-style-type: none"><li>▪ Data value influences investments</li><li>▪ Strategy and execution aligned and continually improved</li><li>▪ Outside-in perspective</li><li>▪ CDO sits on board</li></ul>

D&A = data and analytics; ROI = return on investment

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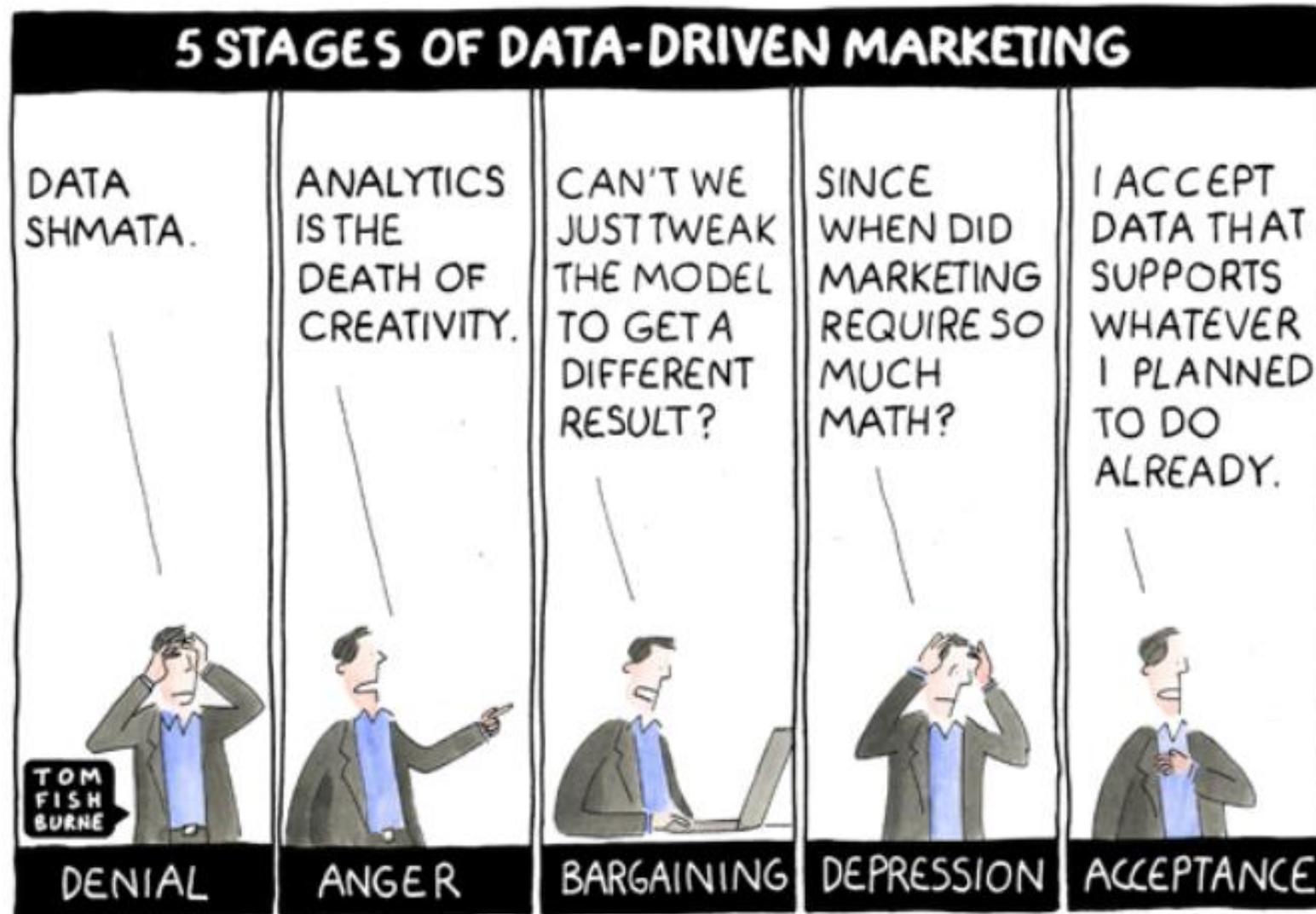
# Why a data-driven organization?

- Gaining a competitive edge through better decision-making and **increased efficiency**
- **increase revenue and reduce costs**
  - a data-driven organization can trust that it always makes informed decisions upon a foundation that is always **reliable** and **up to date**.
  - Reducing cost through more efficient, data-driven processes – both administrative and operational – such as overtime or inventory management
- As such, you **remove whim and guesswork** from the equation, while simultaneously negating the garbage-in-garbage-out problem
- **Bolstering the quality** of products, **reputation** and **organizational processes**
- **Decision support** for operational systems and processes
  - which can range from sales, production and marketing, to maintenance, logistics, service delivery, HR and other industry specific needs
- **More nimbly** (agilely and smartly) **adjust to market changes**
- Paves the way for being **more innovative, proactive and agile**
  - letting the data reveal new business opportunities for which to adapt
- On top of this, the organization **frees up human capital** that can be allocated towards efforts of creating additional value
- **Empower your employees**, equipping them with the tools to **increase their autonomy** and **strengthen their decision-making foundation**
  - a leaner, more efficient organization – and reduced dependency on external assistance
- Reducing cost through more efficient, **data-driven processes** – both administrative and operational – such as overtime or inventory management

# Why a data-driven organization?

- Increased quality
  - Quality in this context is highly connected to **accuracy in decision making, sustainability** and **reputation**.
  - More data-driven, and hence **more qualified decisions**, run all the way through your organization, ensuring:
    - **Increased trust**
    - **Improved environment**, health & safety (HSE) procedures
    - Fewer decisions and reduced loss during production
    - Increased product quality
    - **Increased customer satisfaction**
- As for corporate reputation, **having precise, actionable data available** – and the know-how to apply them – allows you to:
  - **Make better business decisions (~BI)**
  - more precisely communicate with target audiences, where market data are available, strengthening organization-stakeholder relationship
- being at the bleeding-edge of what is often referred to as the fourth industrial revolution
  - Increases brand awareness
  - augments market sentiment
  - **Attracts tech-savvy, aspiring young talent**
- A data-driven organization manages data in such a way that it creates a **single version of the truth**
  - This means and requires that the data is both **relevant, reliable and available**

# Data-Driven Organization



# Data Strategy

Building a data-driven organization **must** be rooted in your organization's business strategy

Both **clear budgetary allocations** and **leadership involvement** on **Data Strategy and Data Culture**

It is crucial at this stage to **start with your business needs, not technology**

What is the problem I need to solve?

What kind of data would help?

Where will I source it from?

How will I store and safeguard it?

How will I analyze it?

Who will be responsible?

How will it be shared across the team?

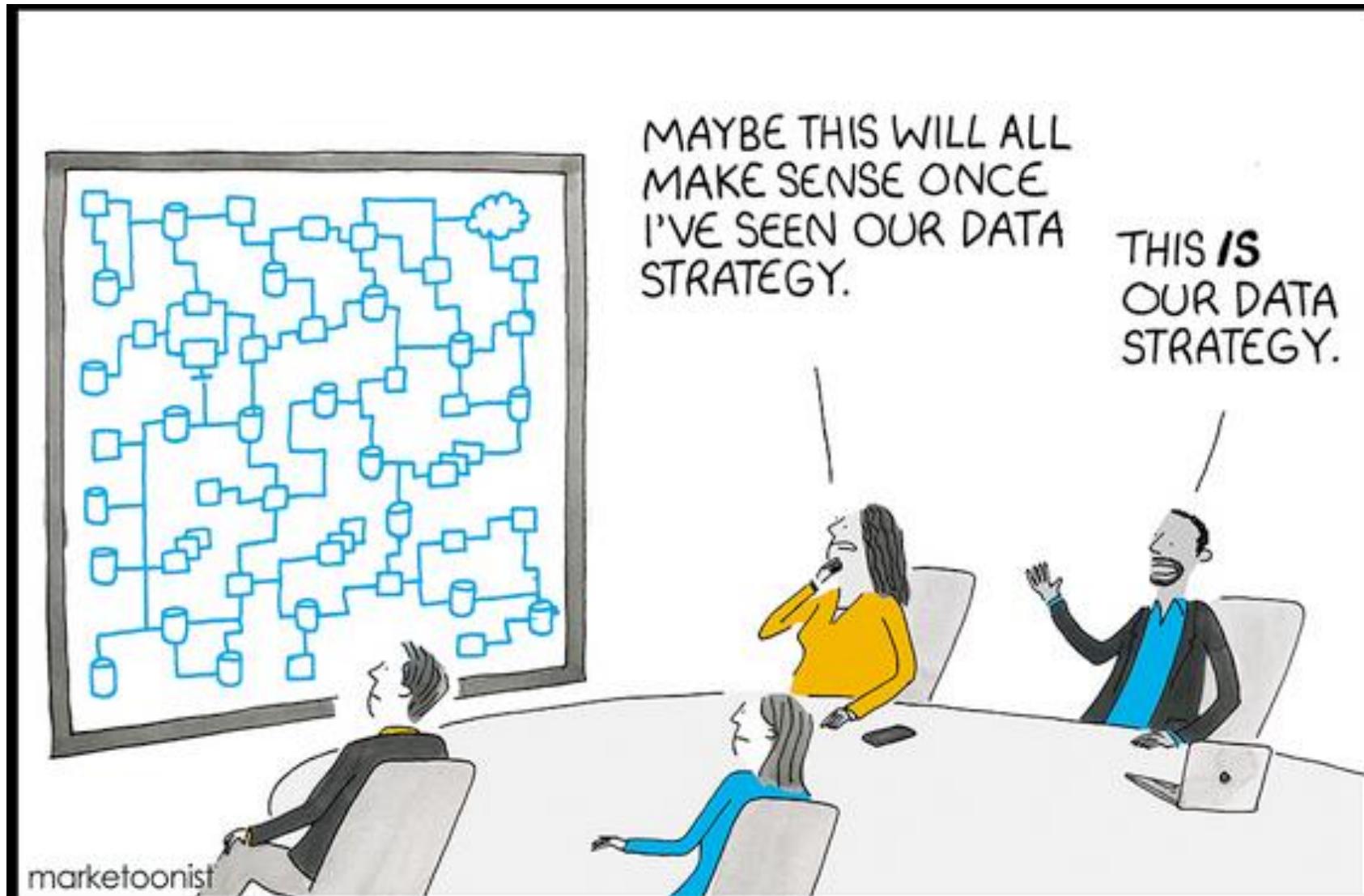
How will it be implemented into the team's working processes?

## How to gain support for your data strategy

- **Transparency:** share data across the business
- **Readability:** present data that anyone can understand
- **Trackability:** track data that monitors business performance
- **Actionability:** source data that pinpoints where to take action



# Data Strategy!



# A Glance at DMBOK2.0 Framework



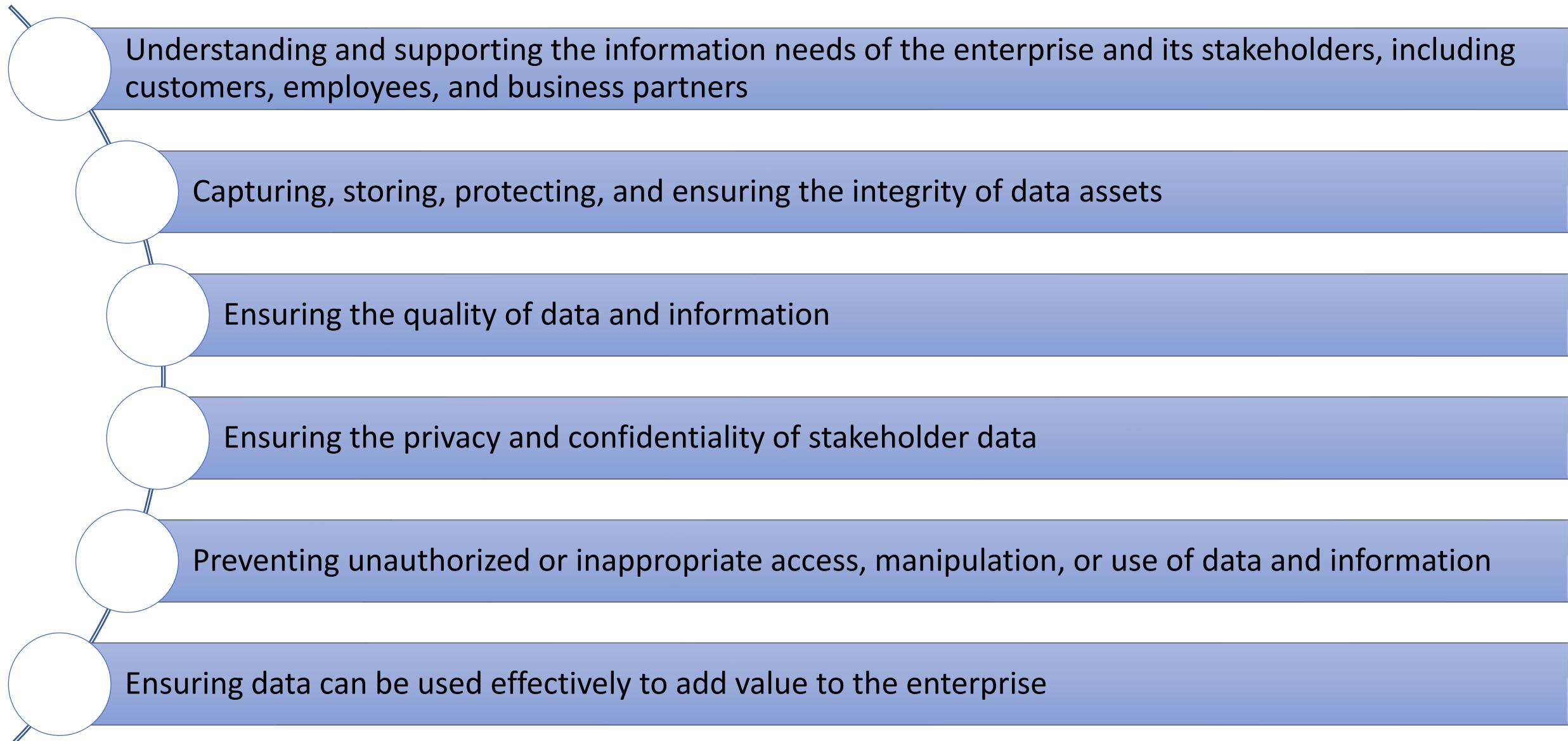
# Data Management

Data

- Is currency, life blood, new oil (and BI is the refinery)
- Is an (virtual) asset like any other (physical) asset
- Is a meta-asset that describes other assets
- Key to competitive advantage
- Enabler for decision-making
- Failure to manage data is like failure to manage capital
- Is the means by which an organization knows itself
- So it is a strategic goal: to get (derive) value from data (assets)
- Not only assets but also vital to the day-to-day operations
- When it is exchanged (internally or externally); it can provide information about how an organization functions -> shows department or company's data maturity level
- Assumption is that data simply exists. But data does not simply exist. Has to be created or Obtained
- Data is a form of information and information is a form of data
- Both data and info should be managed



# Data Management Goals



# The DAMA-DMBOK Framework

## The DAMA Wheel

- defines the 11 Data Management Knowledge Areas

### 1. Data Governance

- provides direction and oversight for data management by establishing a system of decision rights over data that accounts for the needs of the enterprise.

### 2. Data Architecture

- defines the blueprint for managing data assets by aligning with organizational strategy to establish strategic data requirements and designs to meet these requirements.

### 3. Data Modeling and Design

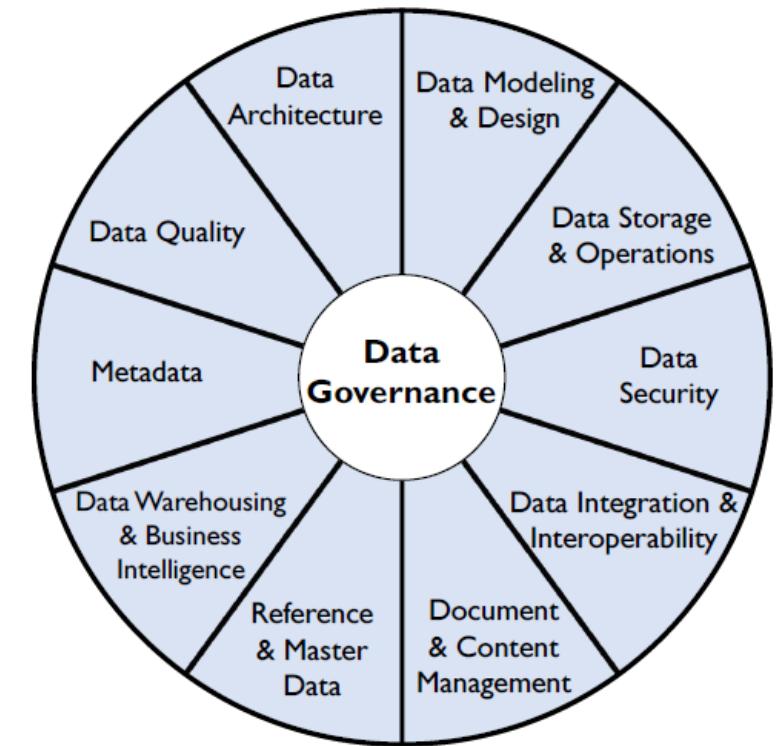
- is the process of discovering, analyzing, representing, and communicating data requirements in a precise form called the data model.

### 4. Data Storage and Operations

- includes the design, implementation, and support of stored data to maximize its value. Operations provide support throughout the data lifecycle from planning to disposal of data.

### 5. Data Security

- ensures that data privacy and confidentiality are maintained, that data is not breached, and that data is accessed appropriately.



# The DAMA-DMBOK Framework

## 6. Data Integration and Interoperability

- includes processes related to the movement and consolidation of data within and between data stores, applications, and organizations.

## 7. Document and Content Management

- includes planning, implementation, and control activities used to manage the lifecycle of data and information found in a range of unstructured media, especially documents needed to support legal and regulatory compliance requirements.

## 8. Reference and Master Data

- includes ongoing reconciliation and maintenance of core critical shared data to enable consistent use across systems of the most accurate, timely, and relevant version of truth about essential business entities.

## 9. Data Warehousing and Business Intelligence

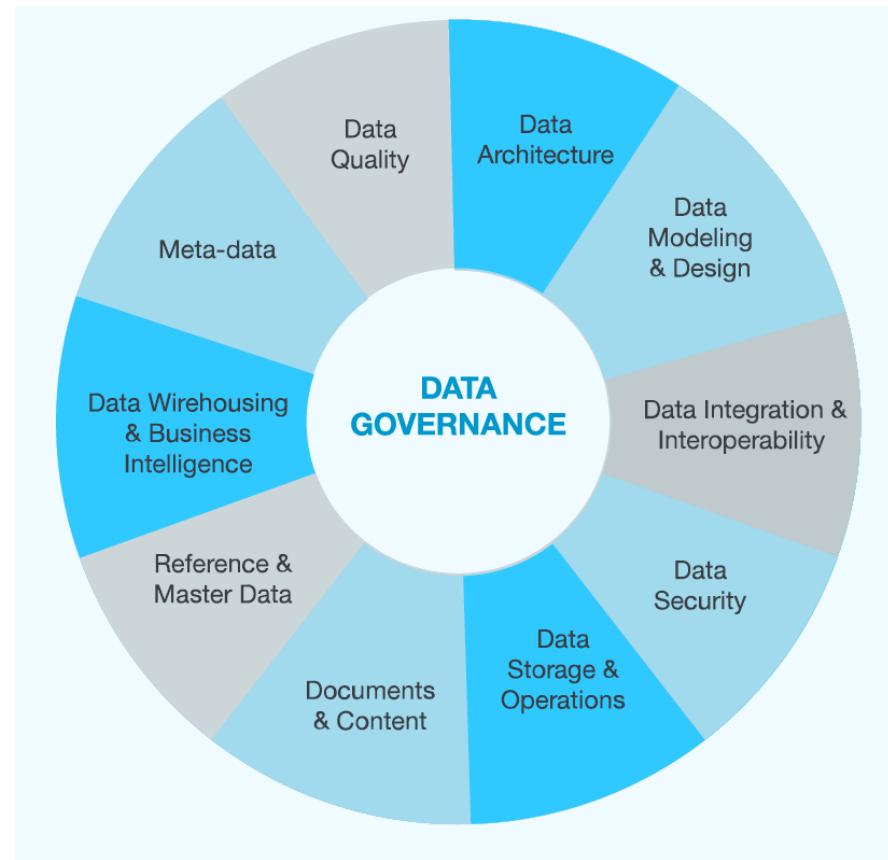
- includes the planning, implementation, and control processes to manage decision support data and to enable knowledge workers to get value from data via analysis and reporting.

## 10. Metadata

- includes planning, implementation, and control activities to enable access to high quality, integrated Metadata, including definitions, models, data flows, and other information critical to understanding data and the systems through which it is created, maintained, and accessed.

## 11. Data Quality

- includes the planning and implementation of quality management techniques to measure, assess, and improve the fitness of data for use within an organization.



# Data Risk and Data Quality

Data not only represents value, it also represents risk



Low quality data (inaccurate, incomplete, or out-of-date) obviously represents risk because its information is not right



But data is also risky because it can be misunderstood and misused



Organizations get the most value from the highest quality data –

available      relevant      complete      accurate      consistent      timely      usable      meaningful      understood



Information gaps – the difference between what we know and what we need to know to make an effective decision; and so profound impacts on operational effectiveness and profitability.

# Data Literacy

Data literacy is about making users that are not part of an organization's data team more data literate.

It's about educating regular business users about the information available to them and organizing this information in a way that makes it easy to identify and consume.

When a data governance team acknowledges the importance of data literacy in an organization's data governance strategy, the result is a well-defined data catalog that any member of staff can access.

When they don't, many users are left without access to important data impeding their ability to perform professionally and contribute to the overall growth of a data-driven company.

Without widespread data literacy and clearly defined data terms and frameworks, communication channels can break down—and the results can be catastrophic.

Before implementing a data literacy program your data team needs to ask these key questions:

- How can we organize our data so people can find it easily?
- How do we find and determine which terms are necessary for our company?
- How do we achieve consensus on, define, and present these terms?
- How do we provide universal access when confidential user data is included in the data catalog?

# Data Quality



# DMBOK Framework – Chapter 8 - BI

- Data Warehousing and Business Intelligence
  - Processes for :
    - Planning
    - Implementation
    - Control
  - to manage decision support data
  - And
  - to Enable knowledge workers
  - to Get value from data via Analysis and Reporting

# What is BI?



# Definitions of BI

BI is a **technology-driven process** for analyzing data and delivering actionable information that helps executives, managers and workers make informed business decisions.

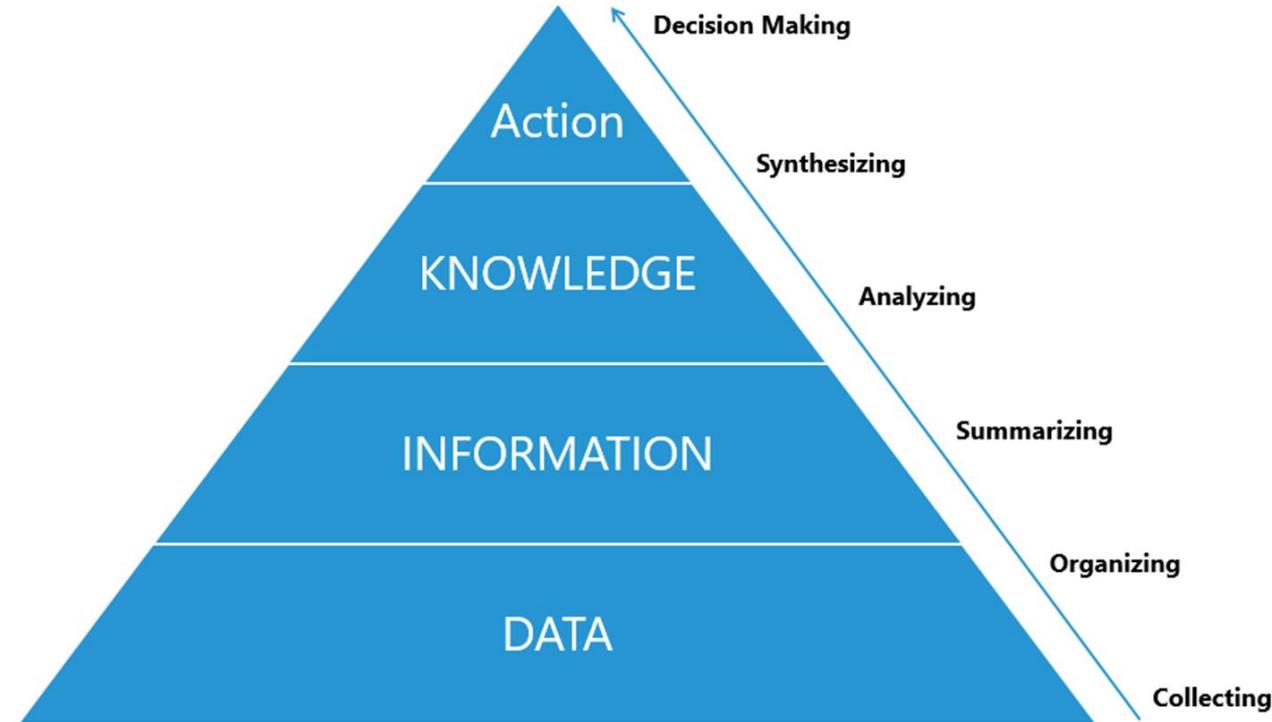
BI is a **set of practices** of collecting, structuring, analyzing, and turning raw data into actionable business insights.

BI considers **methods** and **tools** that transform unstructured data sets, compiling them into easy-to-grasp reports or information dashboards.

BI comprises the **strategies** and **technologies** used by enterprises for the data analysis of business information.

BI is the **process** of turning raw data into actionable information that can improve business decisions.

It is an umbrella term that stands for **both processes and solutions** — the process of transforming data into actionable insights and the tools that access and analyze data and present those findings in an accessible way.



**Data-Driven Decision Making**

# Benefits of BI

speed up and improve decision-making  
**(Faster Analysis by Visualization)**

**Cost cutting** by optimize internal business processes and **Single Truth**

increase **operational and organizational efficiency** and productivity

spot **business problems** that need to be addressed

identify emerging business and market trends, **Why changed?** **What changed?**

develop stronger business strategies  
**(Data-Driven Business)**

drive higher sales and new **revenues** by Trend Awareness

gain a **competitive advantage** over rival companies

It can **monitor customer behavior** and **Improve CX**

**Transparency, Efficiency, Profitability, Sustainability**

It can help **optimize processes** and **Govern Data**

**Centralized Intuitive KPI** dashboards and Easy to access and share info, **No Silo**

**Clear Accountability** through efficient **Governance** and **Reporting**

**Time Efficiency** by shortening decision-making process & **Story Telling**

Allows manpower to focus on **skillful tasks** rather than monotonous tasks

# BI Functions

## Common functions of BI

- Reporting
- Online analytical processing
- Data mining
- Process mining
- Complex event processing
- Business performance management
- Benchmarking
- Text mining
- Descriptive analytics
- Predictive analytics
- Prescriptive analytics

BI solutions provide historical, current and predictive views of business operations

By Business Intelligence,  
Transform data into successful decisions

## BUSINESS INTELLIGENCE



# BI outcomes

Know what your customer wants before they do

## Insight

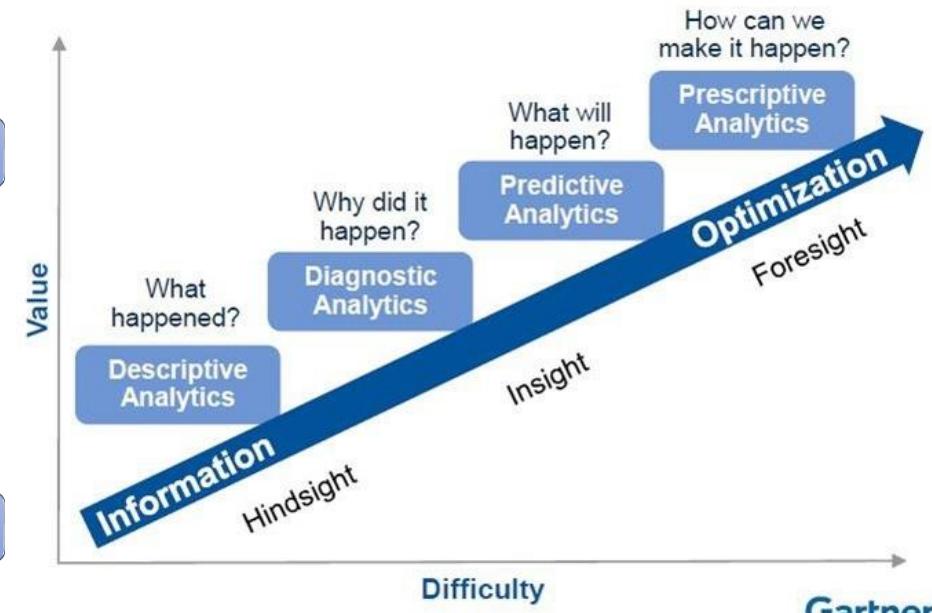
- Reports which tell us the current or former status of our data. This insight answers questions such as:
  - How is the organization performing?
  - How much revenue did we incur?
  - Where do our constituents live?
  - How much funds did we raise?
  - What is the average patient discharge rate during weekends?
- Reports providing insight are valuable, but they mostly offer an operational perspective. Some are used to inform strategic decisions, but they don't always provide the full picture as to why the numbers and outcomes are the way they are.

## Hindsight

- This second outcome of the Analytics & Business Intelligence umbrella provides the analysis needed to understand why we have the current numbers we do –what were the factors, the environment, and decisions which impacted the outcome of these numbers. It answers questions such as:
  - Why are we performing this way?
  - Which investments proved to be successful?
  - What are we learning from the results of A/B testing?
  - What customer factors affected the sales outcomes?
- Hindsight also determines and provides knowledge and understanding of the context.

## Foresight

- The third outcome is about foresight. This showcases the true value of analytics, depending how you define it, because through the exploration of historical and live data and application of different statistical, data mining, predictive, and other analytics' methods, it provides us with a better understanding of the future and the potential paths to follow. It answers questions such as:
  - How will the organization perform in the future?
  - How can we gain a competitive advantage?
  - What effect might certain changes have on our bottom line?
  - Where will most alumni move to one year after graduation?
  - Which customers are more likely to purchase?
  - What impact will the next flu season have on the respiratory clinic?



Use your Customer Insights to Drive your Business Growth

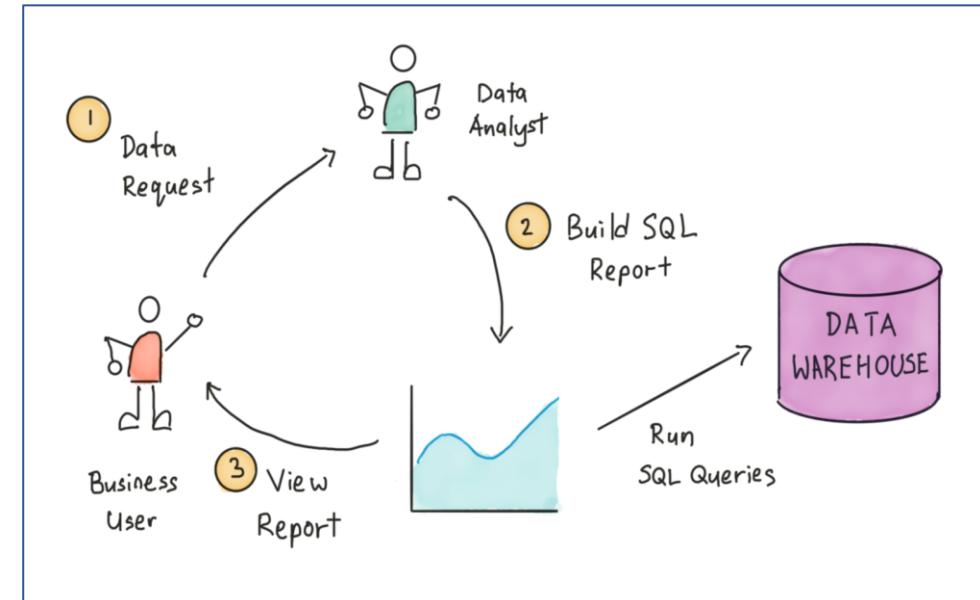
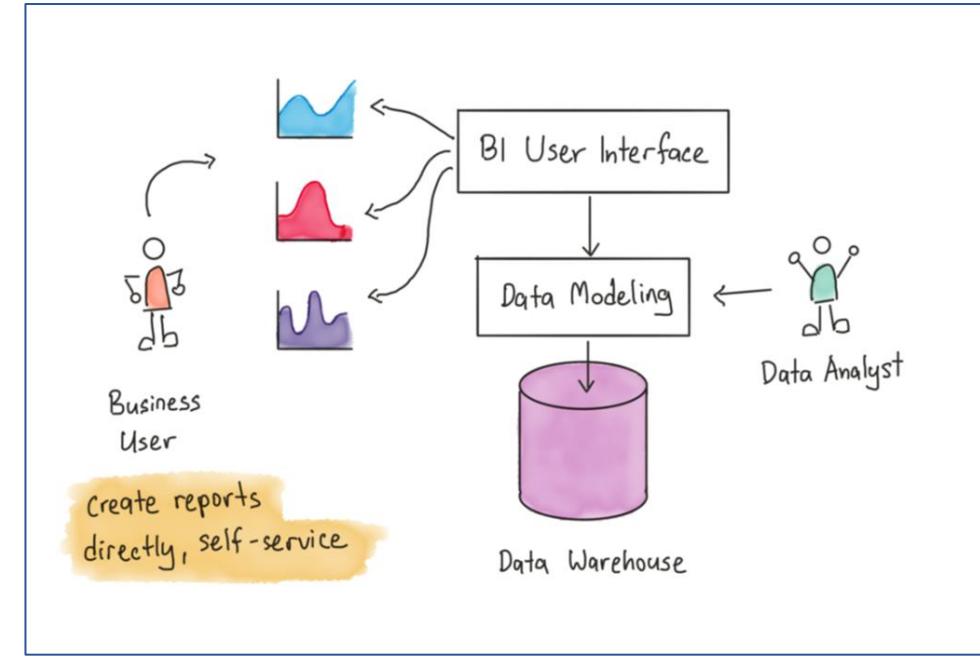
# Self-service BI vs. Traditional BI (Static Reports)

## Self-service BI

- Today, modern companies and solution providers utilize self-service BI. This approach allows business users as well as executives to get the reports that are automatically generated by the system.
- Automated reporting doesn't need power users (admins) from your IT to process each request to your data warehouse; however, technical staff is still required to set up the system.
- Automation may lower the quality of the end reports and their flexibility as it will be limited by the way the reporting is designed. But, as a benefit, the self-service approach doesn't require actual technical staff to operate in the system all the time. Users that are not tech-savvy will be able to serve a report for themselves or access a dedicated section of the data storage.

## Traditional BI

- Traditionally, BI was designed for executives only. Since the number of users and types of data is limited, there's no need for full automation. So, a traditional BI flow type requires technical staff as an intermediary between the reporting tool and the end user.
- If an end user wants to extract some data, he or she has to make a request and tech staff will generate a report from the required data. In this case, your IT department acts as a *power user*, a user that can access data and influence its transformation.
- The traditional approach offers a more secure and controlled data flow. But, relying on the IT department may introduce a lag in flexibility and speed in case of processing big amounts of data (especially for big data). If you strive for more report control and precision of reports, form a dedicated IT team to take care of queries and report formation.



# BI team Roles

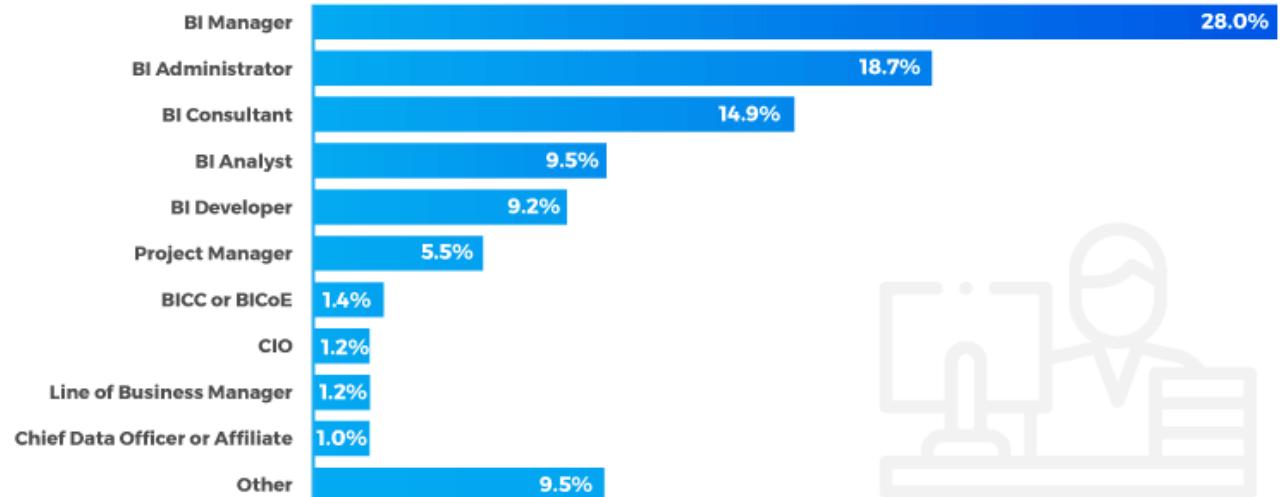
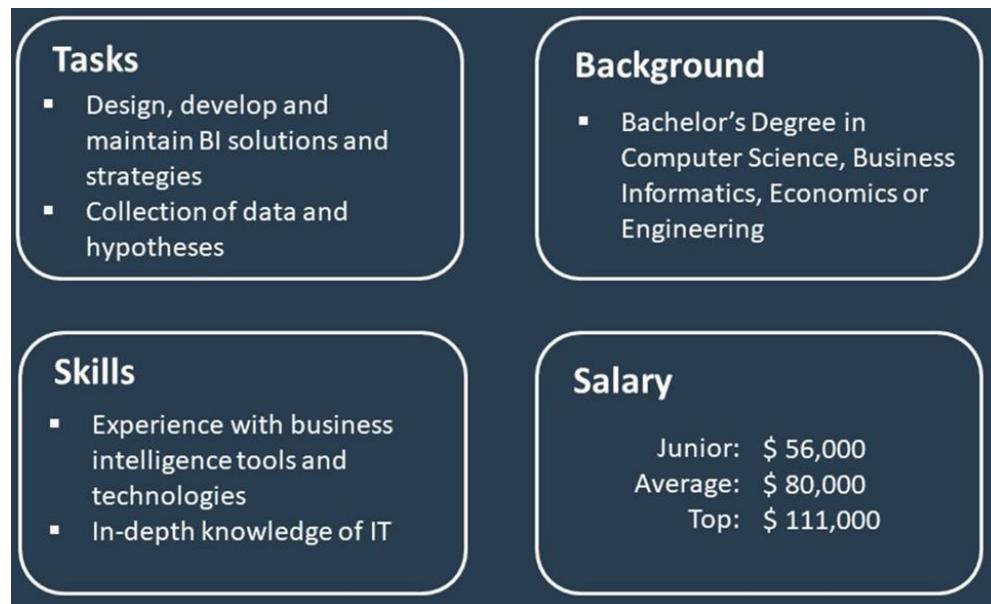
- BI managers
- BI architects
- BI developers
- BI analysts
- BI specialists

who work closely with:

- Data architects
- Data engineers
- Other data management professionals (DMP)

And Also with:

- Business analysts
- End users



# Data Analysis and Data Analytics

## • Data Analysis

- Data analysts must observe, transform, clean, and raw model data to maximize a strategy or process.
- Is "depth analysis of data"
- The data is already in existence, it has to do with the past:
  - "What happened?"
- The scope of data analysis is constrained to a **pre-existing dataset**
- Involves looking at, sorting, and challenging the readily available information

## • Data Analytics

- "Data analytics" refers to the process of "organized computational data analysis"
- Involved with conducting logical, analytical, and logical reasoning to **provide insight into future actions**
- Data analytics encompasses all of the human and machine-assisted procedures that you take to identify, interpret, visualize, and communicate the storyline of trends in your data.
- To make insights accessible and understandable to other stakeholders
- Applied **statistical data, machine learning, AI, and Data Science** all fall under data analytics
- An obvious tangible outcome of an analytics process is the production of well-planned reporting that incorporates data visualization.
- Data analytics can assist you in the following ways:
  - Recognize patterns and trends
  - Identify opportunities
  - Identify potential threats and benefits
  - Decide on a plan of action

# Business Intelligence or Business Analytics?

BI & BA

- Are not the same

Business intelligence

- relies on real-time and historical data. In essence, it tells organizations what's happening and how things got to this point

Business analytics

- focuses on predicting what is going to happen in an organization in the future based on past trends and offering suggestions for things that could be done differently for improved outcomes

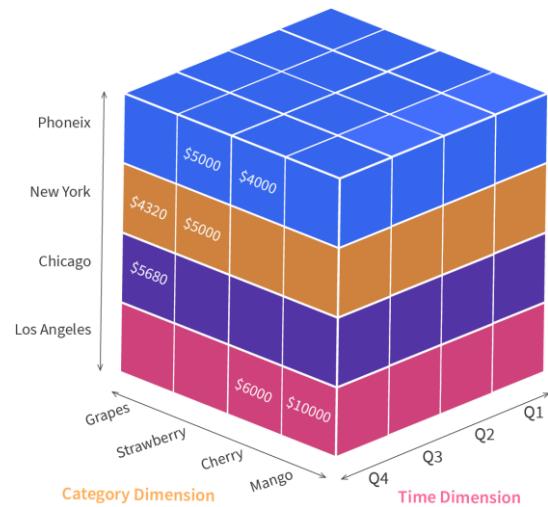
B. Analytics

- can be a part of the business intelligence process

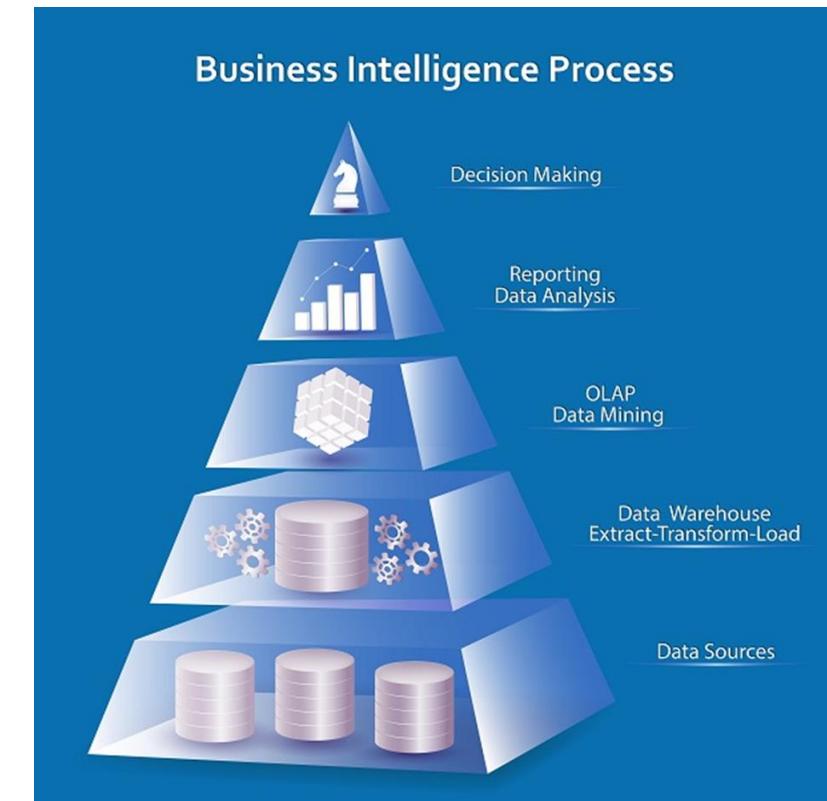
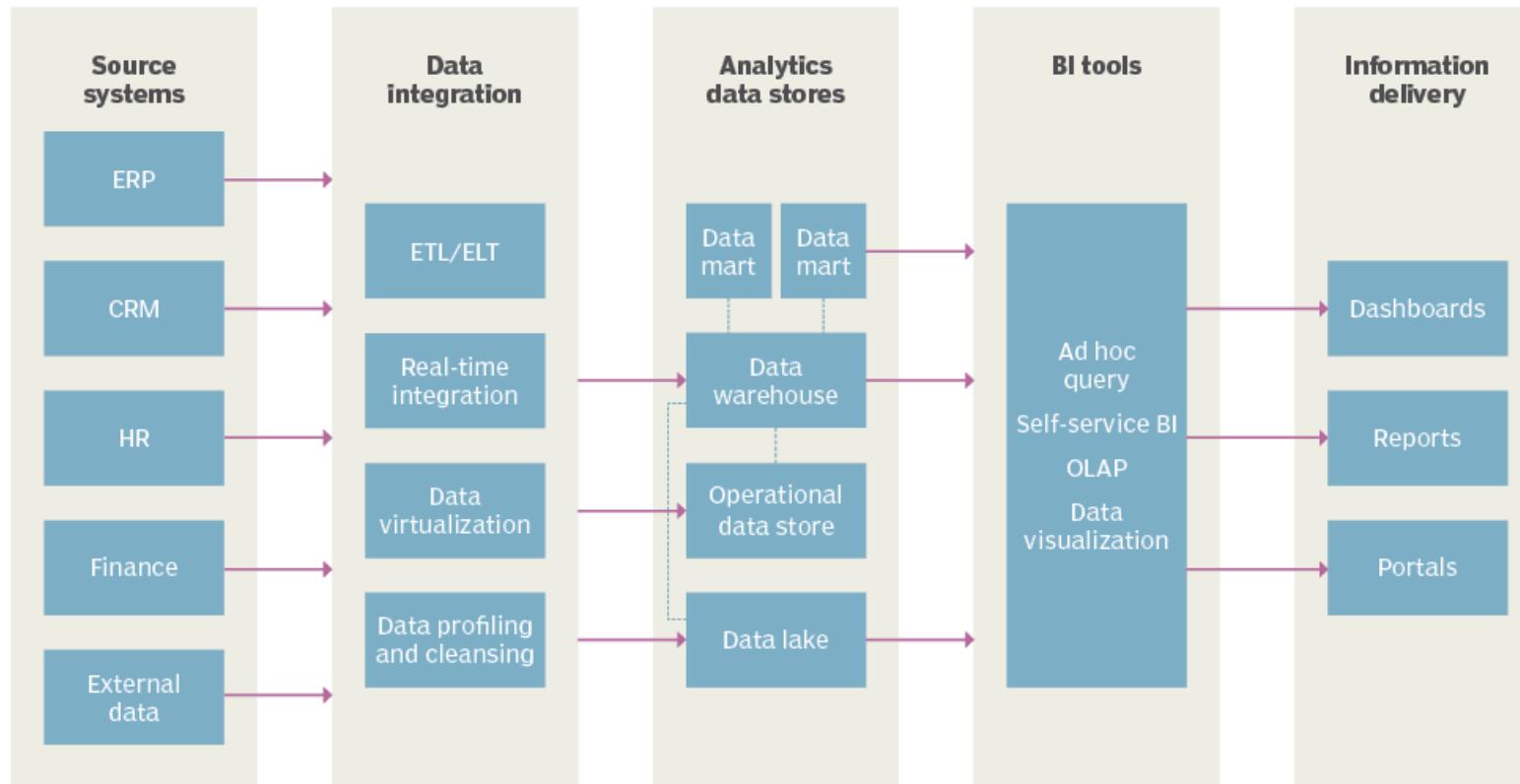
Question:

- What is Business Analysis? Answer: BA -> BABOK; BI -> DMBOK; DA -> DSBO

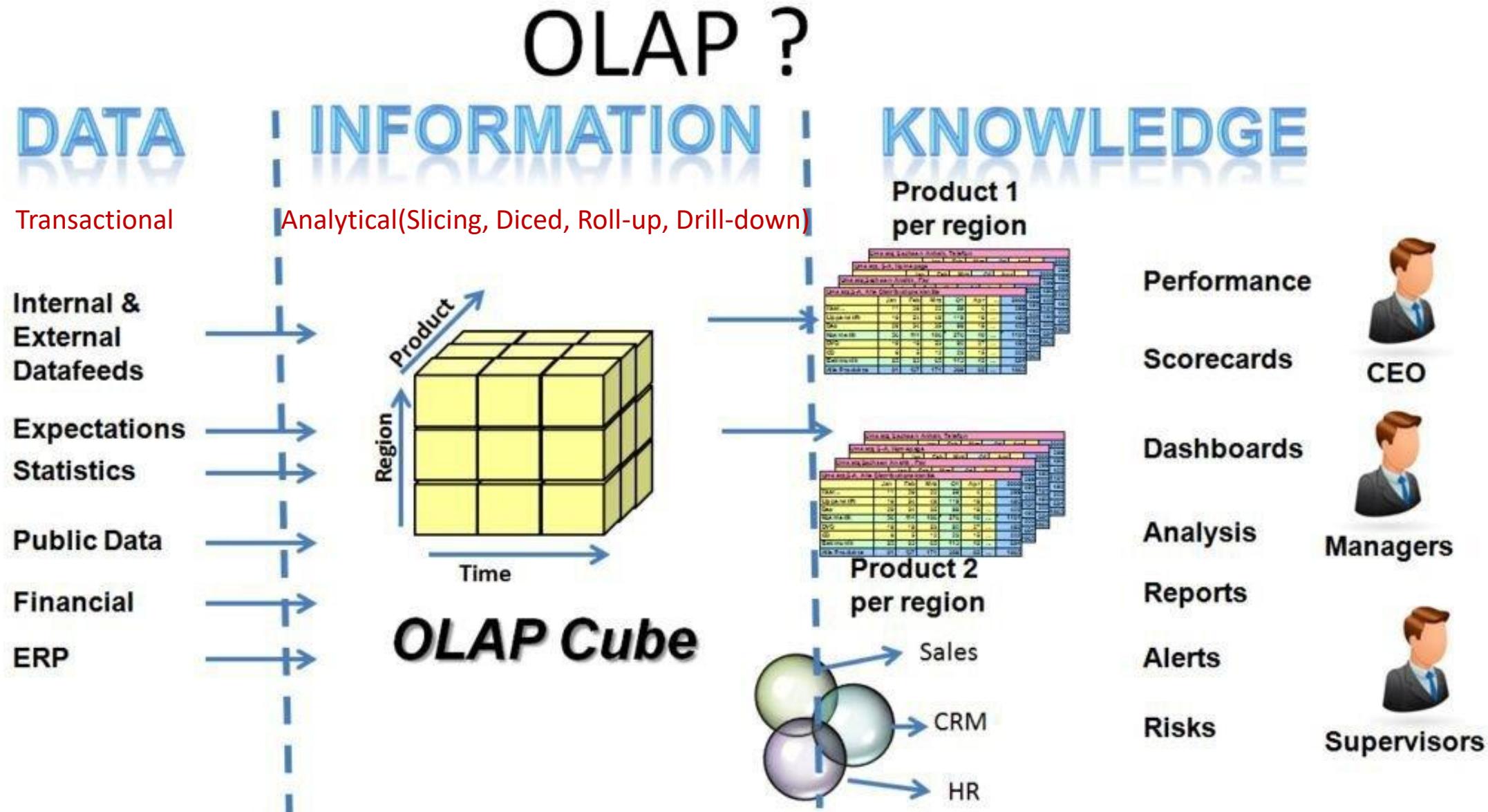
# How does BI work?



# BI Architecture

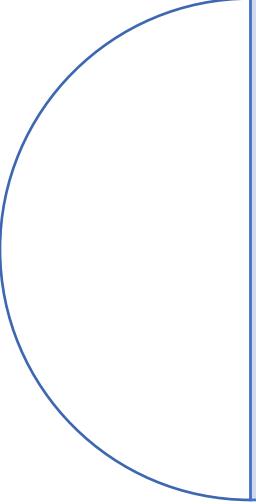


# How BI Works?



# Data Warehouse & Data Marts





# Top BI tools

According to Mordor Intelligence, the [business intelligence industry](#) is so popular that it is predicted to reach a value of USD 40.50 billion by 2026

# BI Tools features

Data visualization

ETL, Integration, Data warehouses

Interactive dashboards, Modeling, Query, metrics, KPIs definitions, Languages (DAX, R, Python, ...)

Alerts and notifications (set thresholds for high or low numbers)/can be outside of BI tools

Embedded Analytics (visualization in the company web page, cloud app, or for customer access, ...)

BI reporting tools

Desktop, Cloud, PaaS, SaaS, Enterprise , Self-service

Data Mining, Big Data (Hadoop)

- Also known as “data discovery,” data mining involves automated and semi-automated data analysis to uncover patterns and inconsistencies. Common correlations drawn from data mining include grouping specific sets of data, finding outliers in data, and drawing connections or dependencies from disparate data sets.

Predictive analytics

- forecast future events based on current and historical data. By drawing connections between data sets, these software applications predict the likelihood of future events, which can lead to a huge competitive advantage for businesses.

Descriptive modeling

- seeks to reduce data into manageable sizes and groupings. Descriptive analytics works well for summarizing information such as unique page views or social media mentions.

Decision analytics

- Take into account all the factors related to a discrete decision. Decision analytics predict the cascading effect an action will have across all the variables involved in making that decision.

NLP (Natural Language Processing)

- Data comes in three main forms: structured, semi-structured, and unstructured. Unstructured data is the most common, and includes text documents and other types of files that exist in formats that computers can't read easily.
- also known as text analytics software, combs large sets of unstructured data to find hidden patterns.

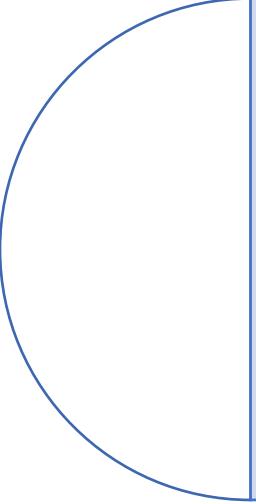
# 25 BI Tools

- Top Business Intelligence Tools

- Enterprise Business Intelligence Platforms
  - #1) Oracle NetSuite
  - #2) Integrate.io
  - #3) Zoho Analytics
  - #4) HubSpot
  - #5) Query.me
  - #6) SAS
  - #7) Birst
  - #8) WebFOCUS
  - #9) BusinessObject
  - #10) IBM Cognos
  - #11) MicroStrategy
  - #12) Pentaho
- Database Integrated Products
  - #13) Microsoft BI and Power BI
  - #14) Oracle BI (OBIEE+ and Endeca)
  - #15) SAP BW + HANA
  - #16) Oracle Hyperion
- Data Discovery And Visualization
  - #17) Qlik and QlikSense
  - #18) Tableau
  - #19) Board
  - #20) Sisense
  - #21) Adaptive Discovery
- Niche And Innovative
  - #22) Yellowfin BI
  - #23) Style Intelligence
  - #24) Bizzscore
  - #25) Jaspersoft

Gartner magic Quadrant (2022)





# Microsoft Power BI

**Bridge the gap between data and decision making**

Microsoft is named a Leader in the March 2022 & 2024 Gartner® Magic Quadrant™ for Analytics and Business Intelligence Platforms.



# Microsoft Power Platform

- **Power BI**

- Power BI is an interactive data visualization software product developed by Microsoft with a primary focus on business intelligence.
- Turn your unrelated sources of data into coherent, visually immersive, and interactive insights.
- Unify data from many sources to create interactive, immersive dashboards and reports that provide actionable insights and drive business results.



- **Power Virtual Agents**

- Chatbots use **artificial intelligence (AI) and natural language processing (NLP)** to help users interact with web services or apps through text, graphics, or speech. Chatbots can understand natural human language, simulate human conversation, and run simple, automated tasks.
- Create powerful bots using a guided, no-code graphical interface without the need for data scientists or developers.
- Easily build chatbots to engage conversationally with your customers and employees—no coding required.



- **Power Apps**

- Power Apps is a suite of apps, services, and connectors, as well as a data platform, that provides a rapid development environment to build custom apps for your business needs.
- Quickly build low-code apps that modernize processes and solve tough business challenges in your organization using Power Apps.
- Build apps in hours—not months—that easily connect to data, use Excel-like expressions to add logic, and run on the web, iOS, and Android devices.



- **Power Automate**

- Microsoft Power Automate, formerly known as Microsoft Flow until November 2019, is an iPaaS platform by Microsoft for automation of recurring tasks.
- Power Automate is a service that helps you create automated workflows between your favorite apps and services to synchronize files, get notifications, collect data, and more.
- Include powerful workflow automation directly in your apps with a no-code approach that connects to hundreds of popular apps and services.



- **Power Pages**

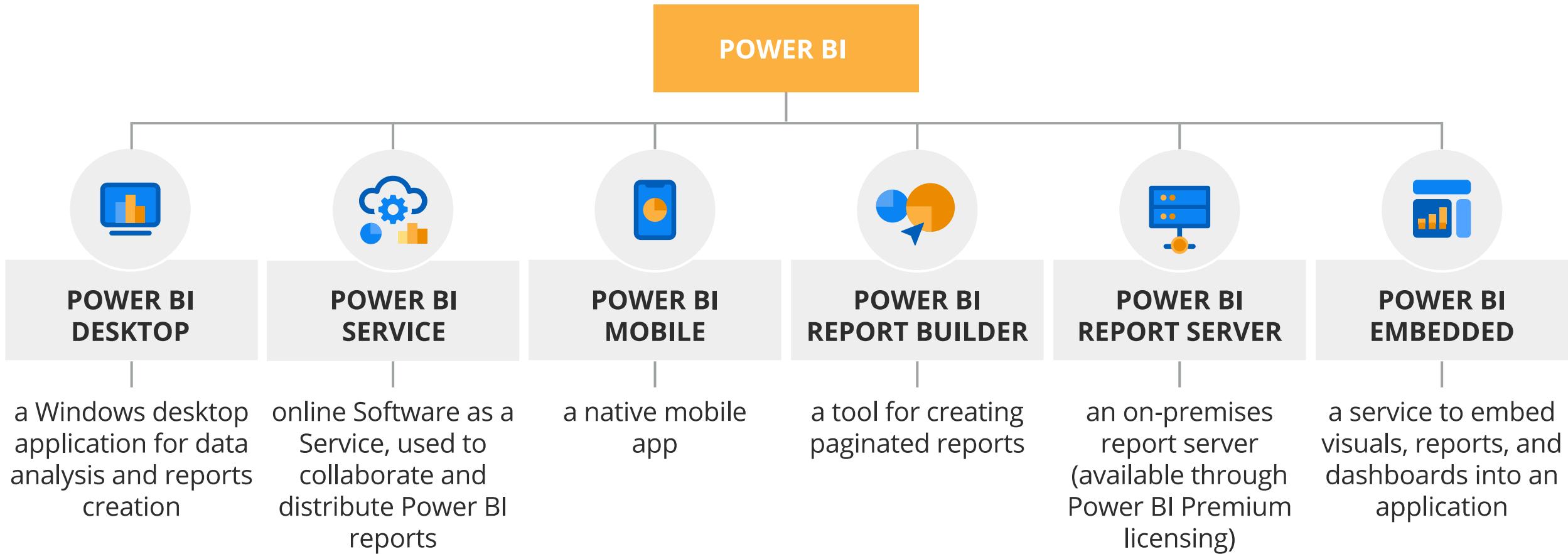
- A new way to build business websites-(Design Studio)
- Design, host, and administer secure, modern, and low-code business websites.

**Note** [Dynamics 365](#) is MS CRM and ERP applications

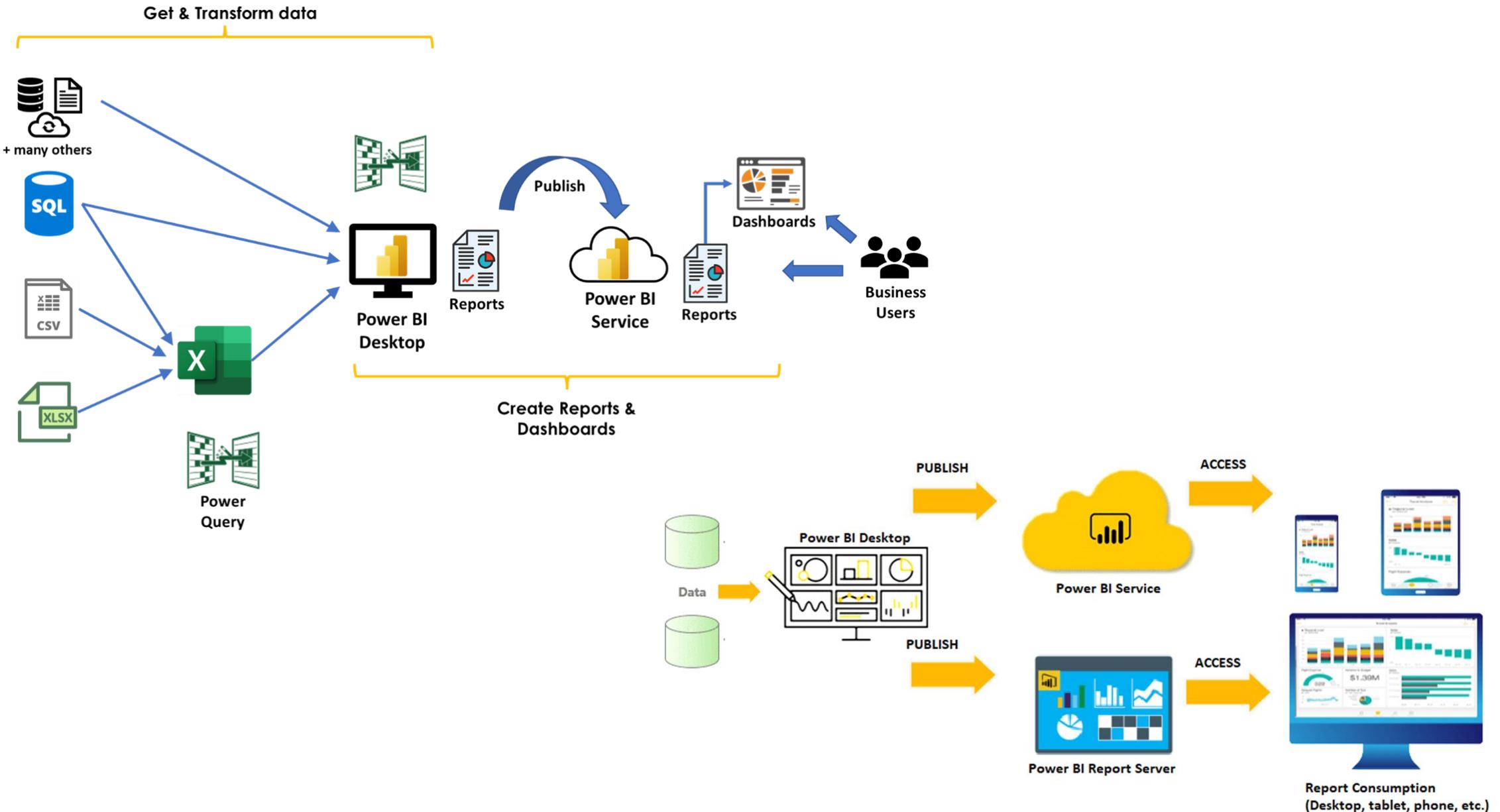
# What is Power BI?

- Power BI is a Business Intelligence (BI) **tool** and a Data Visualization **platform** offered by Microsoft that allows organizations to analyze business data and generate reports.
- Power BI comes with a set of built-in tools, apps, and connectors that can deeply delve and work with data to provide actionable insights, immersive **visuals**, and **interactive reports**.
- Power BI is actually **self-service BI** which means that you can easily aggregate data, analyze data, visualize data, and produce some fantastic-looking visual reports.
- Power BI lets you pull data in from **multiple sources** such as Oracle, SAP, or a Data Warehouse of your choice.
- It can handle everything from your **simple Excel file** all the way to massive amounts of data.
- You can leverage the Power BI Chart, Graphs, KPIs, Reports, and Dashboards to analyze the data and get interactive insights.

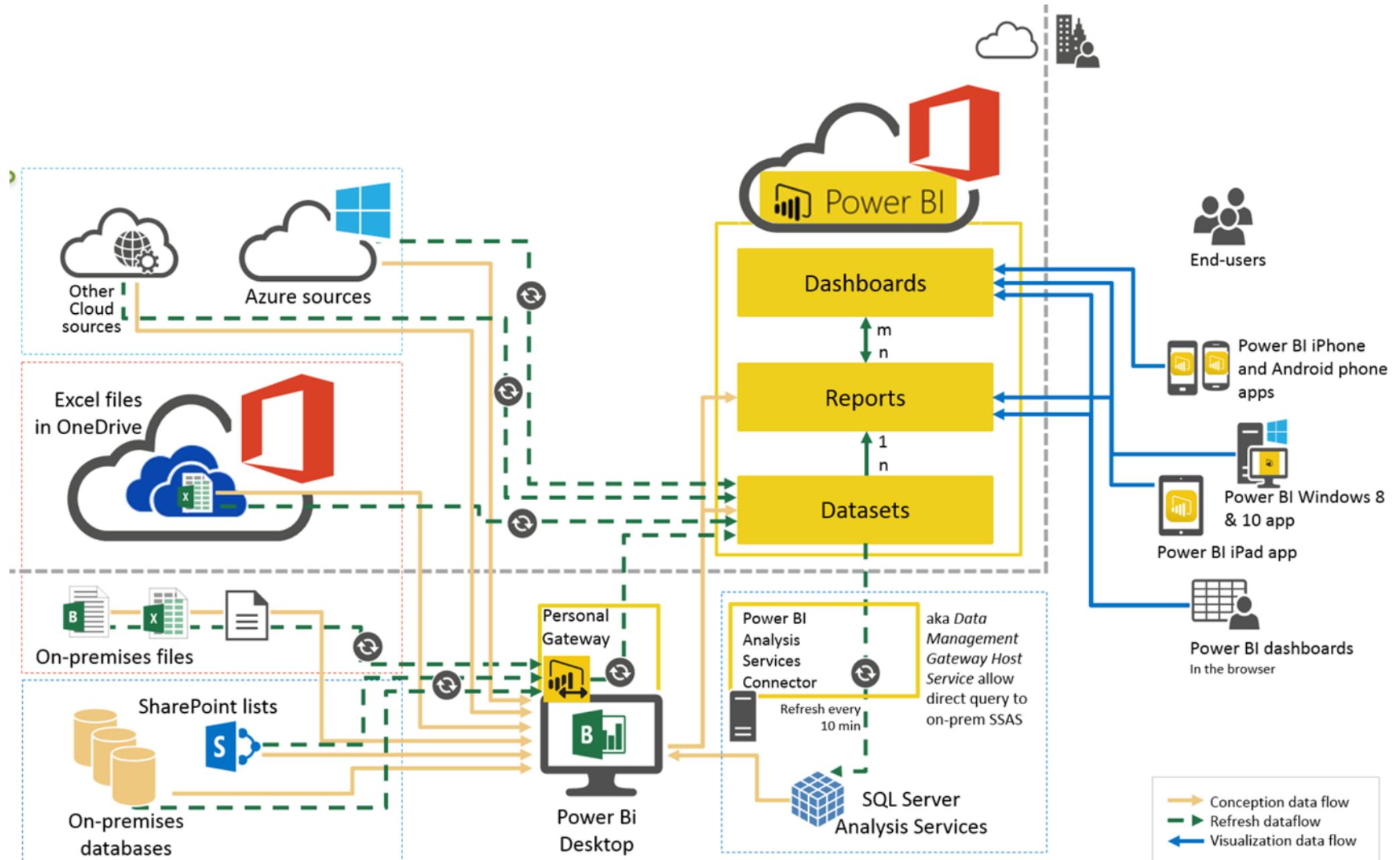
# Power BI Components



# How Power BI works?



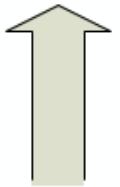
# Power BI Architecture



# Power BI Connection Types: DirectQuery, Live, or Import?



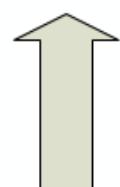
Power BI



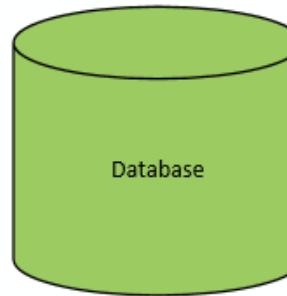
**Live Connection**



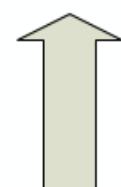
Power BI



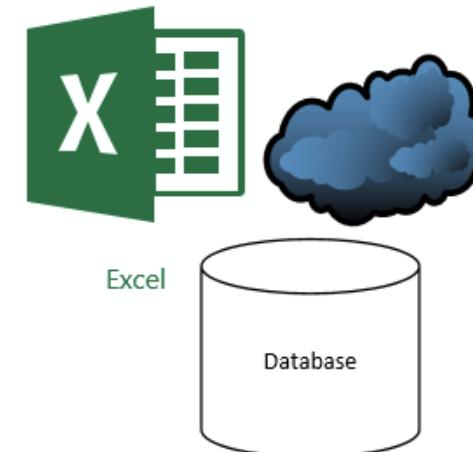
**Direct Query**



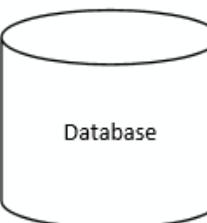
Power BI



**Import Data**



Excel



# Key Features of Power BI

## Easy Integrations

- Power BI offers integrations with multiple connectors that allow users to pull in data from various data sources.

## AI Support

- Power BI allows users to deploy Artificial Intelligence (AI) techniques such as Image Recognition and Text Analytics to prepare data, develop Machine Learning models, and quickly extract actionable insights from structured and unstructured data.

## Report Sharing

- Power BI is built for developing security that allows teams to share access in a very controlled manner. Users can easily share their reports with other team members without compromising data security.

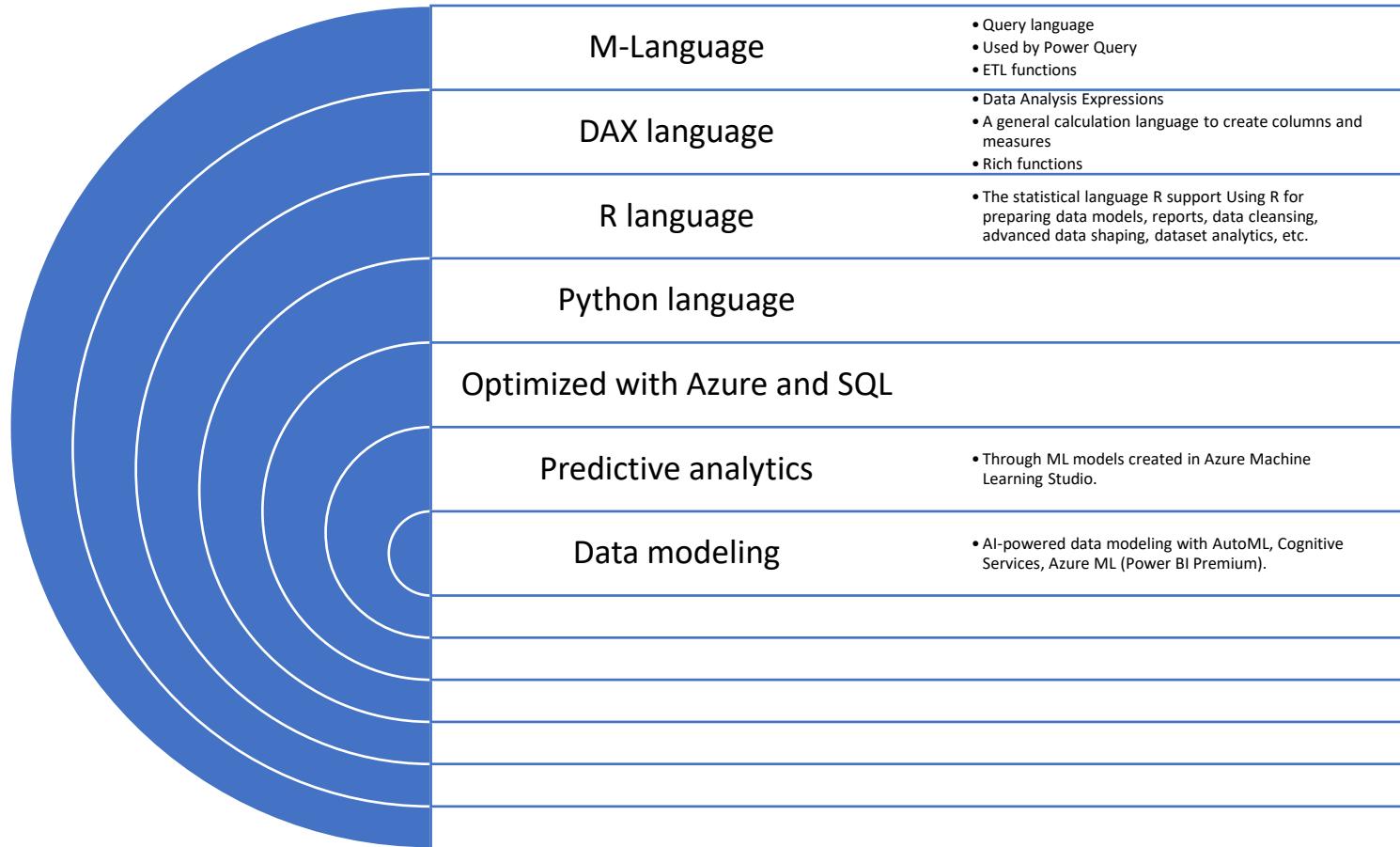
## Real-Time Dashboards

- Power BI has the capability to display real-time data and visuals in any report or dashboard. Power BI dashboards update in real-time allowing users to instantly solve issues and uncover opportunities.

## Customized Visualization

- Power BI offers high customizability and allows users to leverage its custom visualization library to create visualizations as per their needs.
- In addition to that, analysts can also generate highly customizable visuals for their next Power BI report by using open-source data-viz modules from [R](#) and [Python](#)

# Power BI languages



# Power BI Products and Pricing

Power BI Desktop	Power BI Pro	Power BI Premium	Power BI Embedded
<ul style="list-style-type: none"><li>Creating and editing customized reports for every level of expertise.</li><li>Data ingestion from hundreds of supported data sources.</li><li>Data transformation, cleaning, data model creation with built-in Power Query Editor.</li><li>AI-driven analytics.</li><li>Interactive reporting with pre-built or custom visuals.</li></ul>	<ul style="list-style-type: none"><li>Self-service BI in the cloud.</li><li>Creating, editing and sharing reports and dashboards among users.</li><li>Collaboration in personal and team workspaces.</li><li>10 GB of storage per user.</li></ul>	<ul style="list-style-type: none"><li>Enterprise BI both on-premises and in the cloud.</li><li>Dedicated storage (100 TB) and compute resources.</li><li>Consumption of Power BI content without individual licensing.</li><li>Maintaining BI assets on-premises with the Power BI Report server.</li><li>Paginated reporting.</li><li>Multi-geo capability.</li></ul>	<ul style="list-style-type: none"><li>Reports, dashboards and visual analytics embedded into applications.</li><li>An extensive library of data connectors, APIs, and fully documented SDKs.</li></ul>
Free	\$9.99 user/month	\$4,995 dedicated cloud storage and compute resources/month with an annual subscription	Pay-as-you-go: from \$1.0081/hour to \$32.2506/hour

# PBI RS

- Microsoft Power BI Report Server- September 2024
  - Power BI Report Server, available as part of Power BI Premium, enables on-premises web and mobile viewing of Power BI reports, plus the enterprise reporting capabilities of SQL Server Reporting Services.
  - **Version:**
    - 15.0.1110.120
  - **File Name:**
    - PBIDesktopRS.msi
    - PBIDesktopRS\_x64.msi
    - PowerBIReportServer.exe
  - **Date Published:**
    - 10/5/2022
  - **File Size:**
    - 305.2 MB
    - 344.4 MB
    - 401.9 MB
  - **Supported Operating System**
    - Windows Server 2016, Windows 10, Windows Server 2019, Windows Server 2022, Windows 11
  - **You'll need**
    - .NET Framework 4.8 or later
    - SQL Server Database Engine (2012 or later), to store the report server database
    - SQL Server Analysis Services (2012 SP1 CU4 or later), for your Live Analysis Services data sources
  - **Links:**
    - Get [free from Microsoft Pages](#)
1. Install Power BI Report Server (PowerBIReportServer.exe)
  2. Configure your report server using Report Server Configuration Manager
  3. Install Power BI Desktop (PBIDesktopRS\_x64.msi)
-

# Power BI Links

- **Start Create reports**
  - <https://learn.microsoft.com/en-us/power-bi/create-reports/>
- **Get samples for Power BI**
  - <https://learn.microsoft.com/en-us/power-bi/create-reports/sample-datasets>
- **Visualization types in Power BI**
  - <https://learn.microsoft.com/en-us/power-bi/visuals/power-bi-visualization-types-for-reports-and-q-and-a>
- Microsoft Ignite
  - <https://learn.microsoft.com/en-us/power-bi/>
- **Get started**
  - [Learn the business value of Power BI](#)
  - [Microsoft Power Platform Fundamentals](#)
  - <https://learn.microsoft.com/en-us/power-bi/learning-catalog/paginated-reports-online-course>
  - <https://learn.microsoft.com/en-us/power-bi/learning-catalog/developer-online-course>
- **Power Bi vs. tableau**
  - <https://powerbischool.ir/%D8%AA%D8%A7%D8%A8%D8%B9-sum-%D9%88-sumx-%D8%AF%D8%B1-dax/>
  - <https://data-goblins.com/power-bi/visualize-measure-dependencies>

# Power BI Links

- **Contoso for PBI**

- <https://www.microsoft.com/en-us/download/details.aspx?id=46801&6B49FDFB-8E5B-4B07-BC31-15695C5A2143=1>
- <https://github.com/sql-bi/Contoso-Data-Generator/releases/tag/v1.1.0>
- <https://github.com/microsoft/Power-BI-Embedded-Contoso-Sales-Demo/tree/main/ContosoSalesDemo/PowerBIReport>
- <https://community.powerbi.com/t5/Desktop/Contoso-Sales-Pipeline-Report-download-pbix/m-p/2807980>

- **PBI developer**

- <https://github.com/microsoft/PowerBI-CSharp>
- <https://docs.microsoft.com/rest/api/power-bi/>
- <https://github.com/Microsoft/PowerBI-Developer-Samples>
- <https://github.com/microsoft/powerbi-powershell>
- <https://playground.powerbi.com/>

- **PBI Galleries**

- <https://community.powerbi.com/t5/Data-Stories-Gallery/bd-p/DataStoriesGallery>

- **Gallery Monster boat Game:**

- <https://community.powerbi.com/t5/Data-Stories-Gallery/Cross-the-River-Riddle/td-p/839877>

- **Power BI Blog connection**

- <https://community.powerbi.com/t5/Data-Stories-Gallery/Power-BI-Blog-Collection/td-p/1150252>

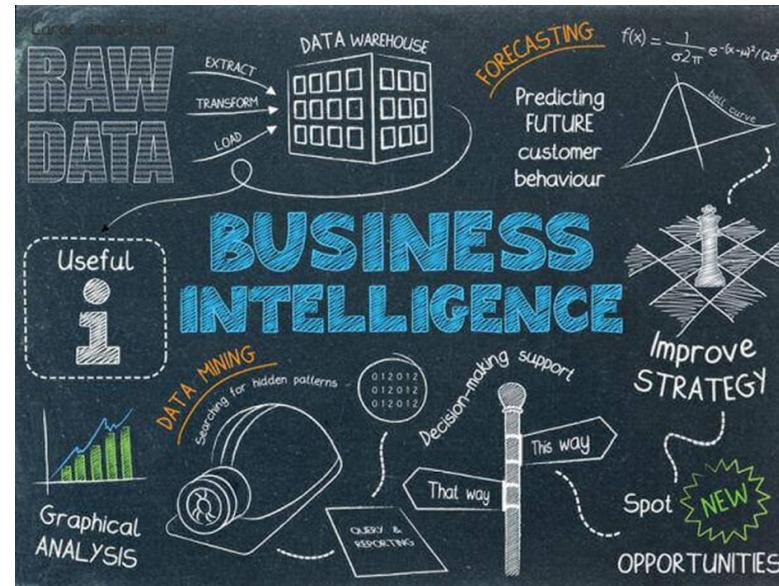
# Download PBI file

- <https://powerbi.microsoft.com/en-us/downloads/>
- <https://www.microsoft.com/en-us/search/explore?q=power+Bi++for+RS>
- <https://powerbi.microsoft.com/en-us/report-server/>
- <https://www.microsoft.com/en-us/download/details.aspx?id=57270>
- (Desktop RS)
- 
- <https://powerbi.microsoft.com/en-us/report-server/>
- **Power BI Report Server is part of Power BI Premium**
- Power BI Premium, with Power BI Report Server, has you covered with a complete solution. Power BI Premium provides dedicated capacity in the cloud and enhanced performance—without requiring per-user licenses for those consuming reports. And, it includes Power BI Report Server for on-premises reporting.
- <https://www.microsoft.com/en-us/download/details.aspx?id=58494&6B49FDFB-8E5B-4B07-BC31-15695C5A2143=1>
- Power BI training link
- <https://data-flair.training/blogs/>
- <https://data-flair.training/blogs/power-bi-dax-basics/>

# RADACAD free books

- Reza Rad Academy
- Book 1: [Power BI Essentials](#)
- Book 2: [Visualization with Power BI](#)
- Book 3: [Power Query and Data Transformation in Power BI](#)
- Book 4: [Power BI Data Modelling and DAX](#)
- Book 5: [Advanced Analytics with Power BI and R](#)
- Book 6: [Azure Machine Learning Studio: An Unleashed Guide](#)

# BI implementation



# Steps for BI Implementation (Golden Slide)

Establish a BI Vision, Mission and Strategy

Assess current situation

Develop a BI roadmap and prioritize initiatives

Establish BI Governance and funding process

Establish a BI Competency Center (BICC)

Align Business and IT and BI teams

Start Data Architecture and Deploy a Data Dictionary/Master Data

Measure and track ROI/Benefits from BI

Identify CSFs, KPIs, KRIs, PIs, RIs, Metrics, Measures, Monitoring period and their Targets

Choose your BI Tools, Technology, Infra, DWH

Identify Data Sources, start ETL and Modeling

Design and Implement BI Reports

Onboard Stakeholders and End-users

Build Trust in the system, Govern your Data

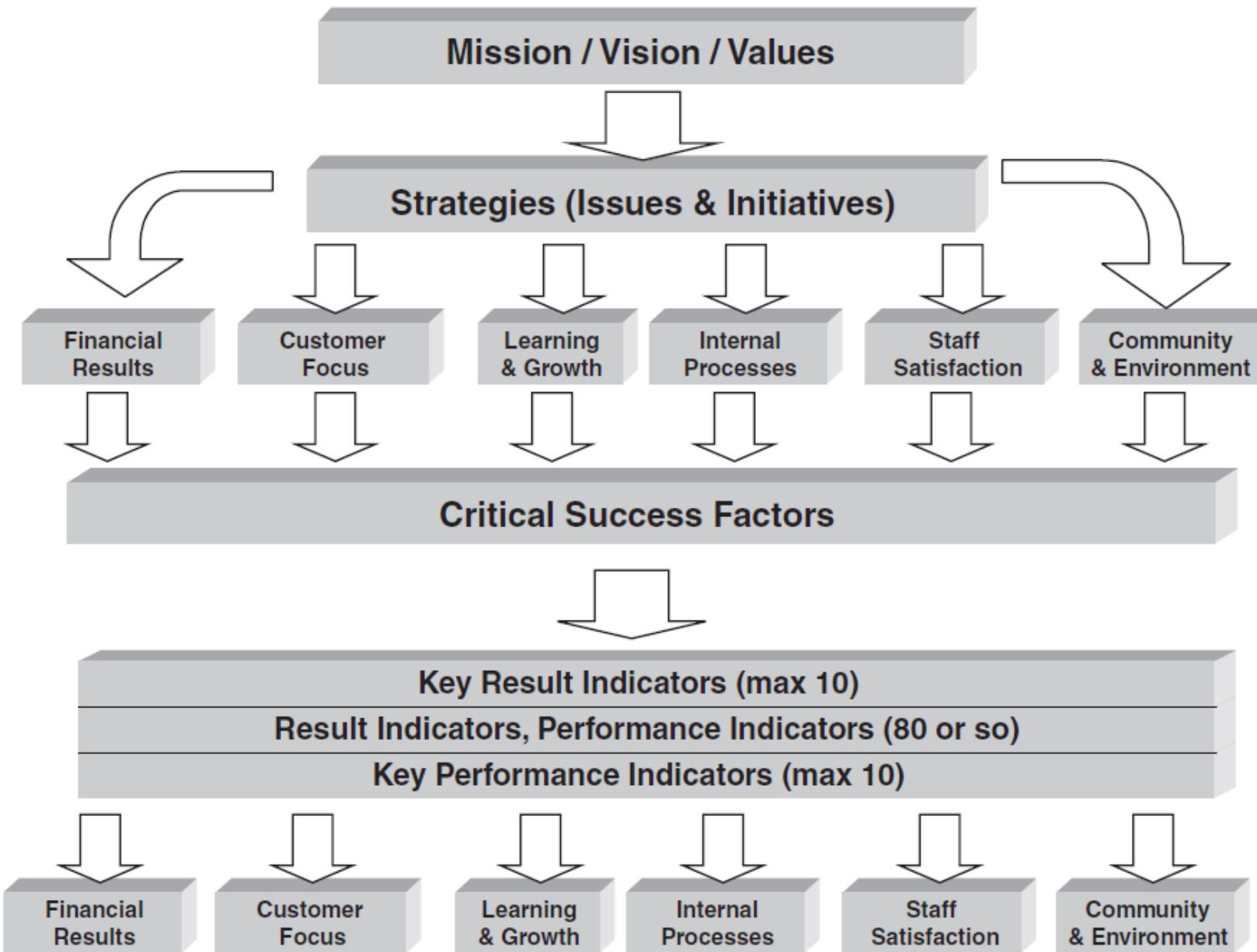
Close the Cycle by Continuous Improvement



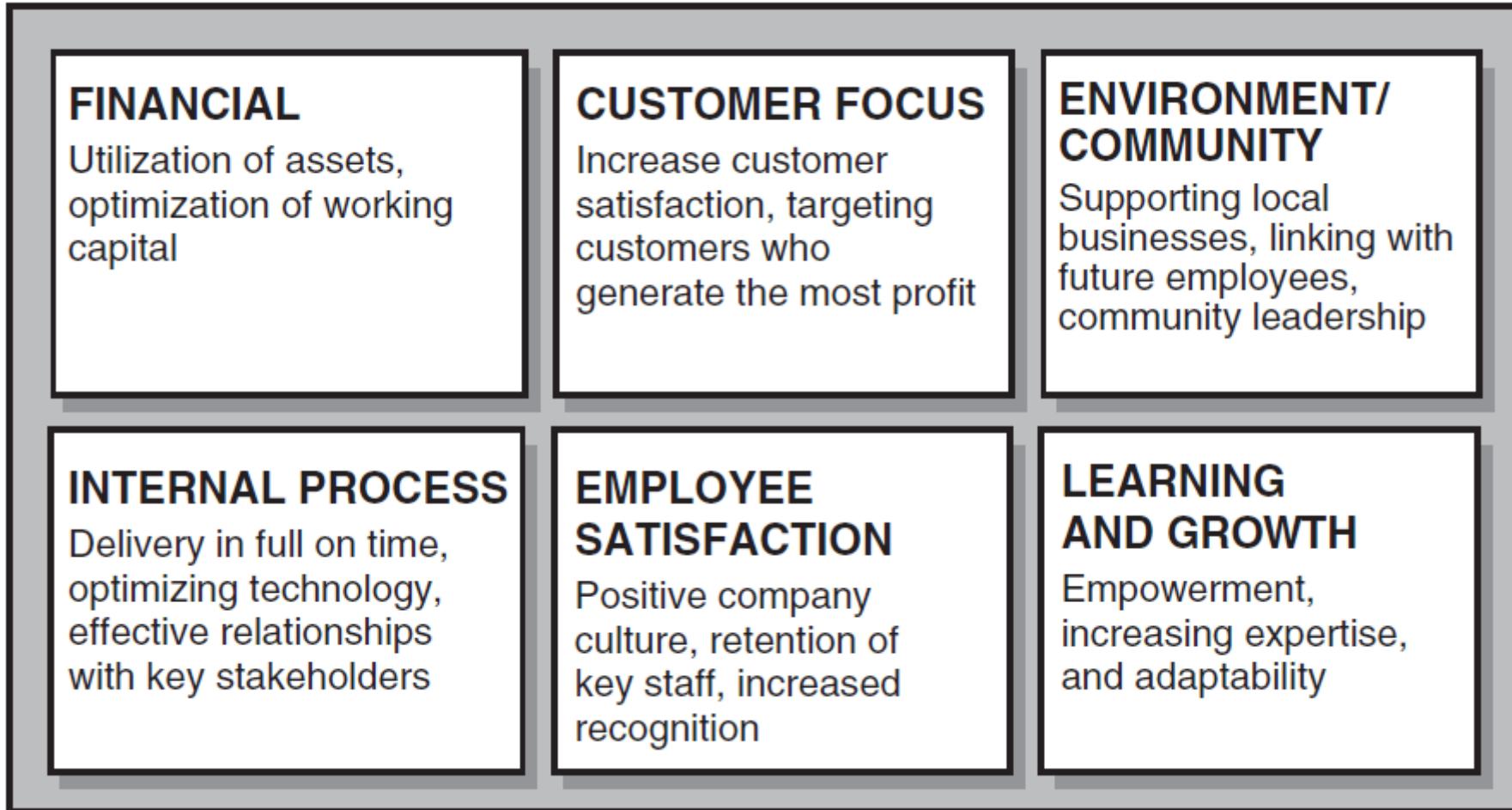
# Chief “Something” Officer -- CDO?!



# Steps from a Mission and Vision to Performance Measures that Work



# Six-Perspective Balanced Scorecard (BSC)



# Sample Doc

**Our mission** To provide energy at the right price at the right time

**Our vision for next five years** To be the preferred energy provider in the xxx

**Our strategies**

1. Acquire profitable customers
2. Increase cost efficiencies
3. Innovation through our people
4. Use best business practices

## Our perspectives and progress

### FINANCIAL

- 😊 Utilization of assets
- 😊 Optimization of working capital, EBIT, growth, etc.

### CUSTOMER FOCUS

- 😊 Increasing customer satisfaction
- 😊 Gaining profitable customers, etc.

### ENVIRONMENT/ COMMUNITY

- 😊 Supporting local businesses
- 😊 Linking with future employees
- 😊 Community leadership, etc.

### INTERNAL PROCESS

- 😊 Process delivery in full on time
- 😊 Optimizing technology
- 😊 Work accidents, etc.

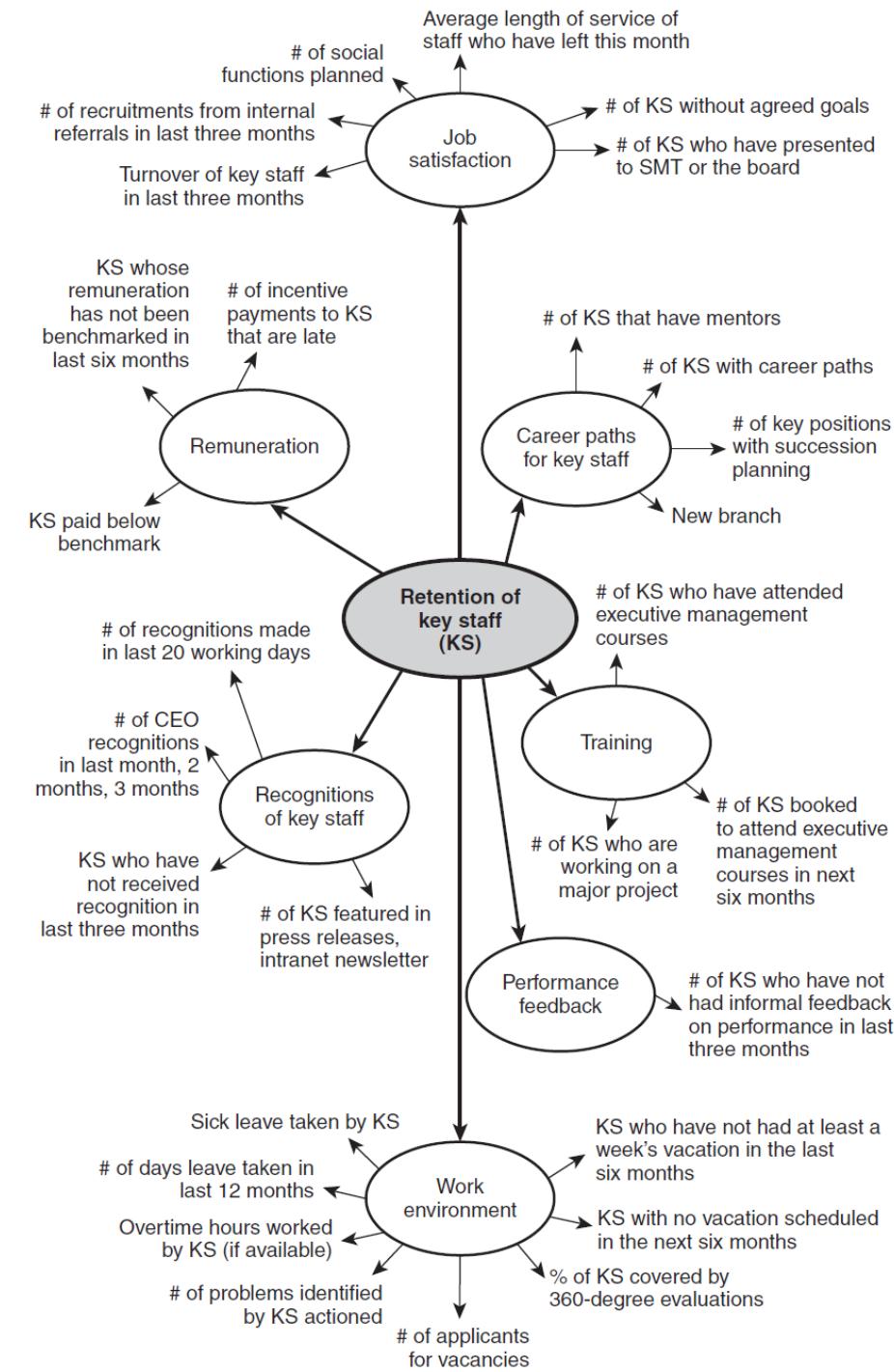
### EMPLOYEE SATISFACTION

- 😊 Positive company culture
- 😊 Retention of key staff
- 😊 Increased staff recognition, etc.

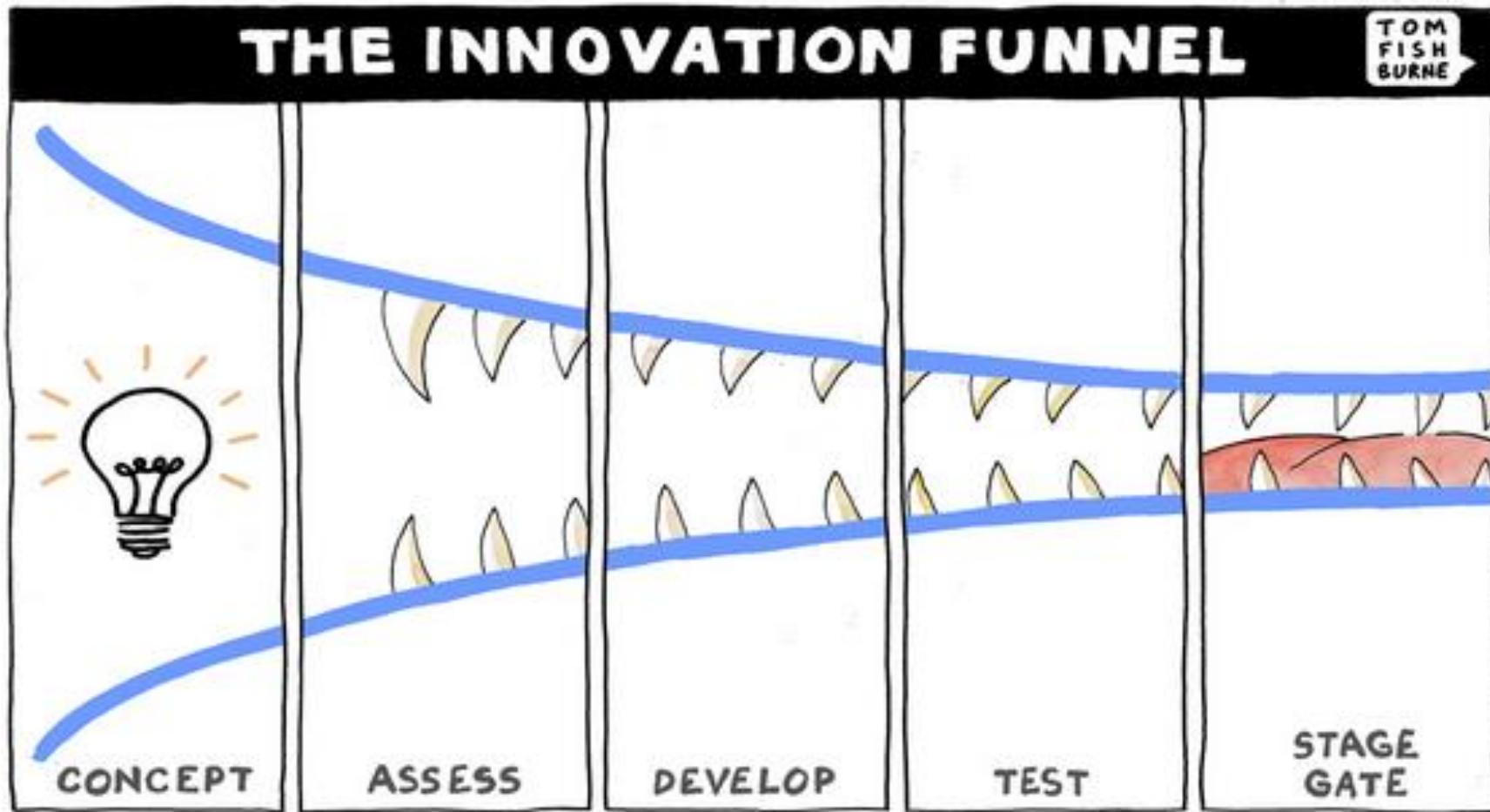
### LEARNING AND GROWTH

- 😊 Increasing empowerment
- 😊 Increasing staff adaptability
- 😊 Coaching Increasing, etc.

# From CSF to PI or RI



# BI Funnel



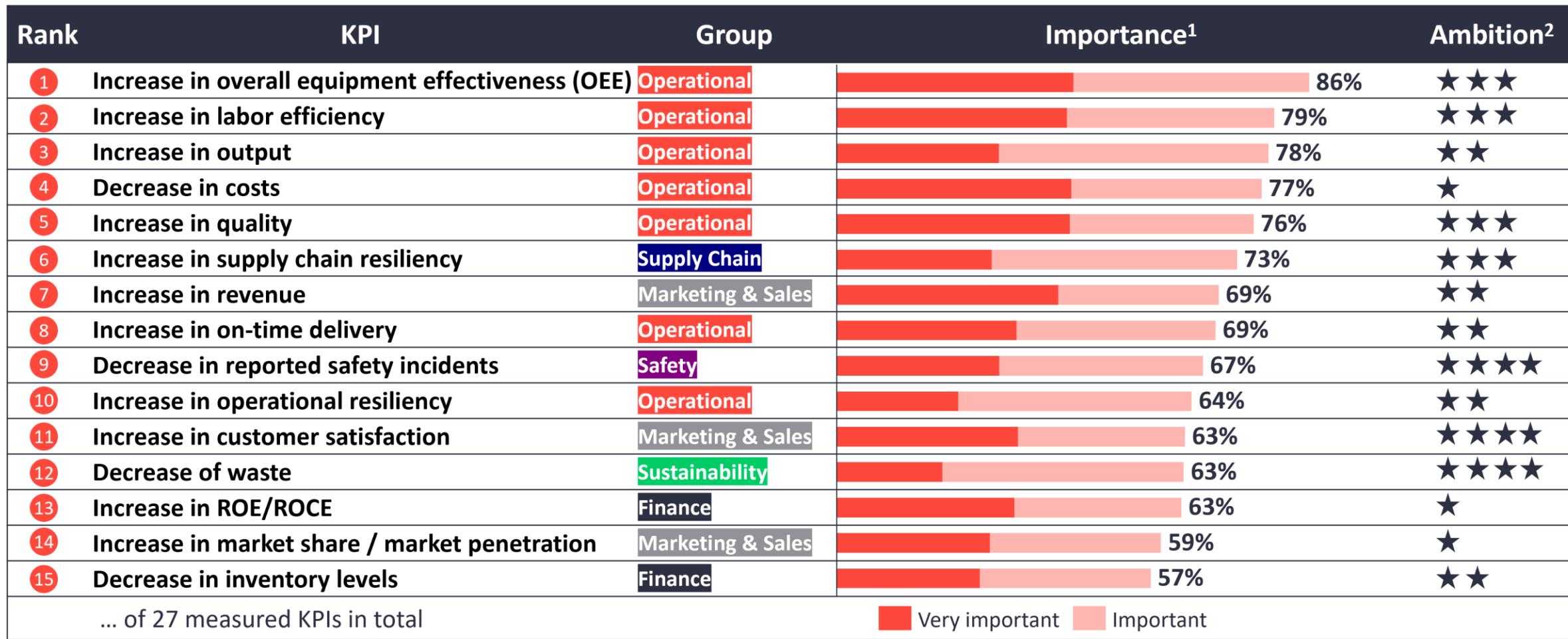
# Define Metrics -Sample for HR Analytics

- Attrition Rate
  - Also 'churn rate,' a company's attrition rate is **the rate at which people leave**. If you break it down, it is the number of people who have left the company, divided by the average number of employees over a period of time.
- Headcount
  - **Number of people working in a company or in a department at any given time**
  - Includes everyone: full-time, part-time, temporary, and contract workers
- Active Employees
- New Joiner
- Exits
- Salary (Base, Jazb, SaT'H, ..)
  - Bonus
  - Company Cost
  - Overtime
  - Employee Cost
- Company (Salary) Cost, by department
- Demography
  - (male, female, age category)
- Leave Type
  - (sick, unpaid leave, Vacation, other)
- Performance Rating
- Annual leave
- Personal info
  - current position/financial details/Work Experience
  - ID/BD/Social/Bank Account/Family info/
- Satisfaction Survey
  - Score, Dep. Group, Staff level, Category, ..
- Staff Assessment
- Leave reason analysis
  - (Better opportunity, Retirement, Personal Reasons, Reduction in Force, other reasons)
- Training/Development
  - Courses

# Define KPIs (Sample for a factory)

- Most important operational KPI:
  - Increase in OEE (Overall Equipment Effectiveness)
    - increase in labor efficiency
    - increased output
    - decrease in costs
    - increase in quality
- Most Important SCM KPI:
  - increase in supply chain resiliency (28% in 3Y)
- Most important safety KPI:
  - Decrease in reported safety incidents
- Most important marketing and sales KPI:
  - Increase in revenue
- Most important sustainability KPI:
  - Reduction of waste
- Most important finance KPI:
  - Increase in ROE/ROCE
    - Return on Equity/Return on Capital Employed
    - evaluate a company's profitability and capital efficiency
    - measures how much net income is generated for the cost of an asset
- Most Important Customer Satisfaction KPI:
  - NSP (Net Promoter Score)

# Top 15 Smart Factory KPIs

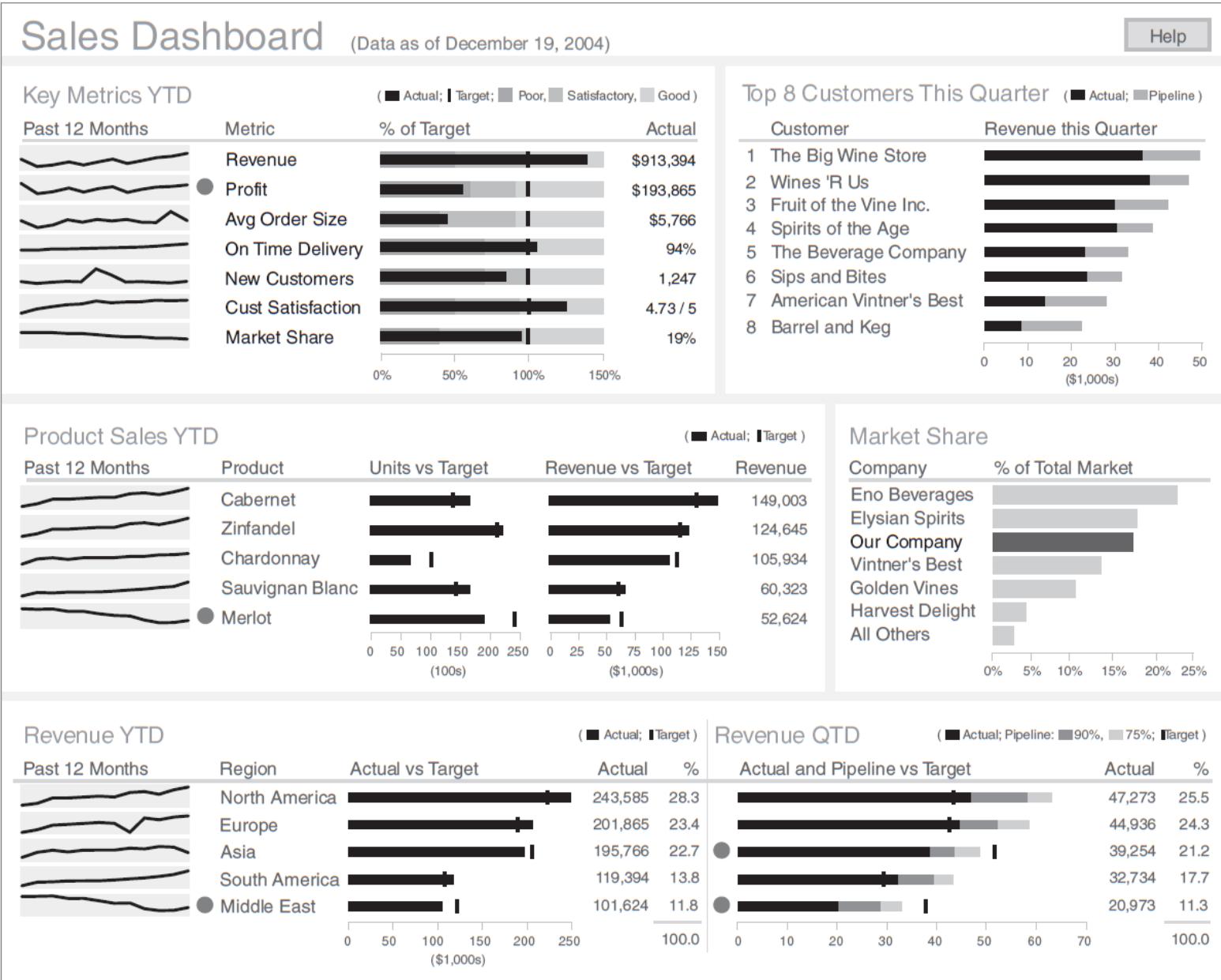


**Ambition (based on % of KPI improvement planned in next 3 years):** ★ :<25% ★★ :25% - 27% ★★★ :27% - 29% ★★★★ :>=29%

**Note:** 1: Share of companies that regard the respective KPI as very important or important for measuring the success of the smart factory strategy 2: Improvement (in percentage) of KPI planned from now (2022) to 2025 (next 3 years).

N= 500 **Source:** IoT Analytics Research 2022, IoT Signals Manufacturing Spotlight 2022(<https://aka.ms/IoTAnalytics-SignalsReportMnf>)

# Dashboard Design

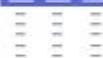


# Choosing Visuals

Comparison	Data Over Time	Correlation	Distribution	Part-to-whole	Ranking
 Bar Chart	 Bar Chart	 Bubble Chart	 Bubble Chart	 Donut	 Ord. Column
 Grouped Bar	 Line Chart	 Column Line	 Grouped Bar	 Stacked Bar	 Ordered Bar
 Line Chart	 Stacked Bar	 Scatterplot		 Treemap	 Ribbon
 Bubble Chart	 Area Chart				 Decomp. Tree
 Area Chart	 Stacked Area				 Funnel
 Stacked Bar	 Bubble Chart				
 Ribbon	 Waterfall				
 Shape Map					
 Donut					
 Treemap					

# Choosing Sizing Scales (Mobile View/Desktop View)

**Small Scale**      **Large Scale**

 Card	 KPI	 Bar Charts	 Scatterplot
 Filter	 Gauge	 Area Charts	 Treemap
 Donut HIGH LEVEL		 Maps	 Table
	 Donut GRANULAR		 Ribbon
		 Matrix	 Line Column
		 Waterfall	 Funnel

# Choose Proper Charts

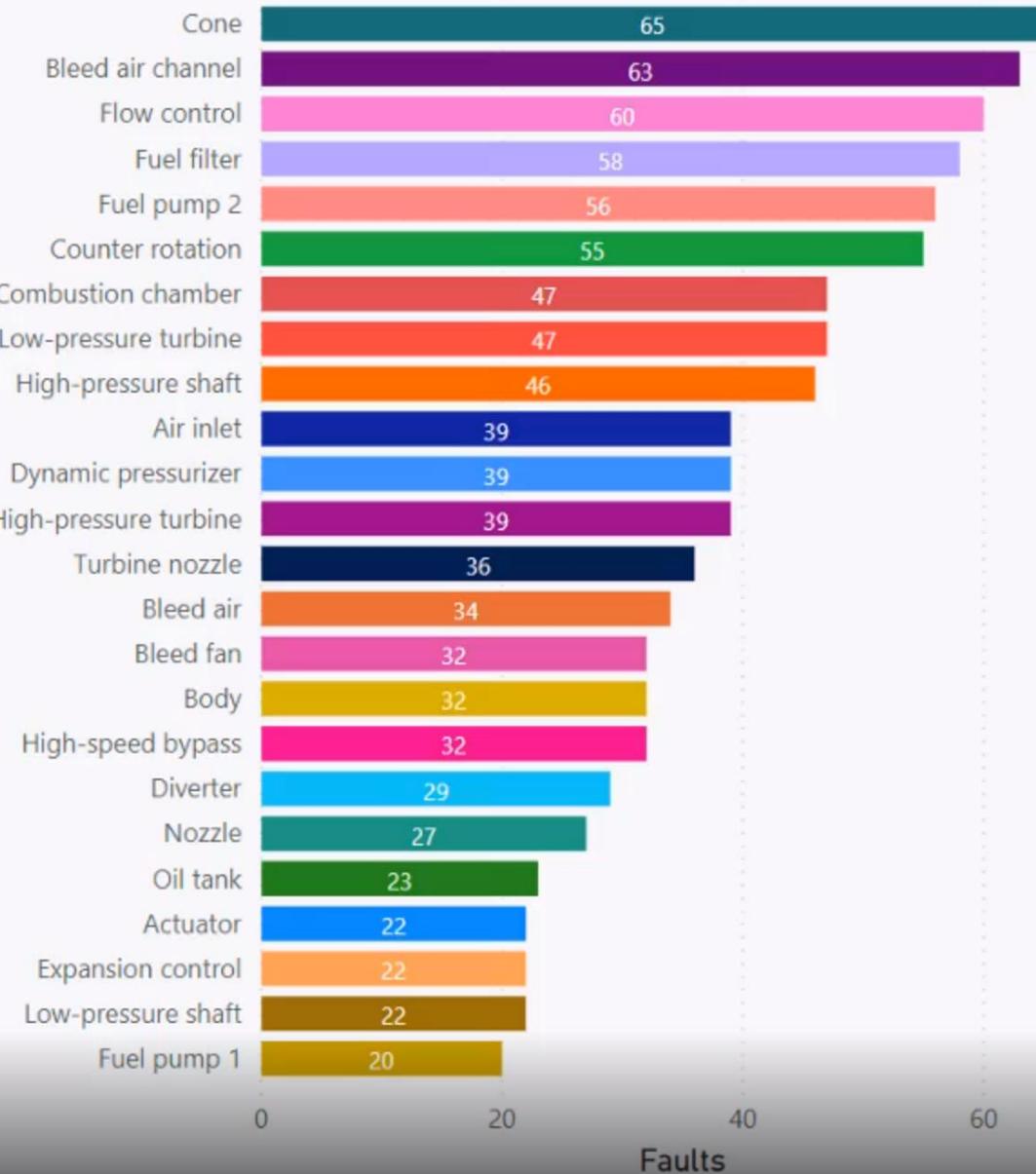
The chart selection guide is organized into two main sections: **Structure** (charts with vertical axis) and **Time series** (charts with horizontal axis). The **Structure** section is further divided into five categories: Comparison, Part to whole, Series Comparison, Variance, and Integrated variance. Each category contains examples of Column, Line, Area, and Dot charts.

	Column	Line	Column	Line	Area	Dot
<b>Comparison</b> Trend analysis or Breakdown and ranking						
<b>Part to whole</b> Compare part to total or analyze accumulation						
<b>Series Comparison</b> Compare two or more data series						
<b>Variance</b> Analyze deviation/variance to plan, PY, FC, target, etc.						
<b>Integrated variance</b> Compare variance to base value (gap analysis)						

# Choose Proper Charts

	Structure - charts with vertical axis		Time series - charts with horizontal axis			Multiple charts			
	Column	Line	Column	Line	Area	Dot	Extended	Combo	Small multiples
<b>Comparison</b> Trend analysis or Breakdown and ranking									
<b>Part to whole</b> Compare part to total or analyze accumulation									
<b>Series Comparison</b> Compare two or more data series									
<b>Variance</b> Analyze deviation/variance to plan, PY, FC, etc.									
<b>Integrated variance</b> Compare variance to base value (gap analysis)									
<b>Contribution of variance</b> Analyze correlation									

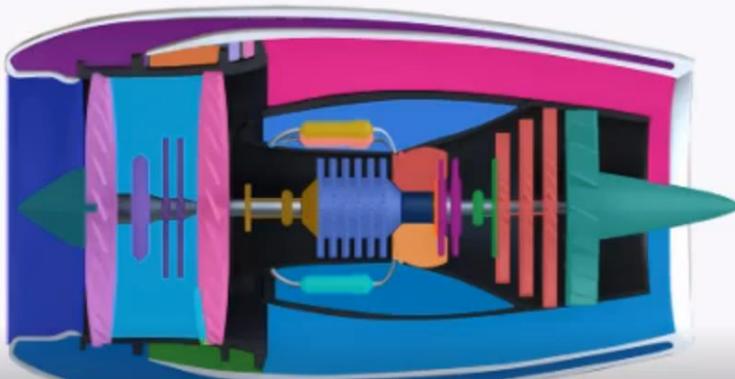
## Faults by Engine Part



Engine 3/4 View



Engine Lateral View





# HR ANALYTICS

**Headcount Statistics**

**Financial Statistics**

**Demographic Statistics**

**Employee Details**

Disclaimer: Data presented in the Dashboard is not actual.

Any resemblance with any person is purely coincidental

Year

2017

2018

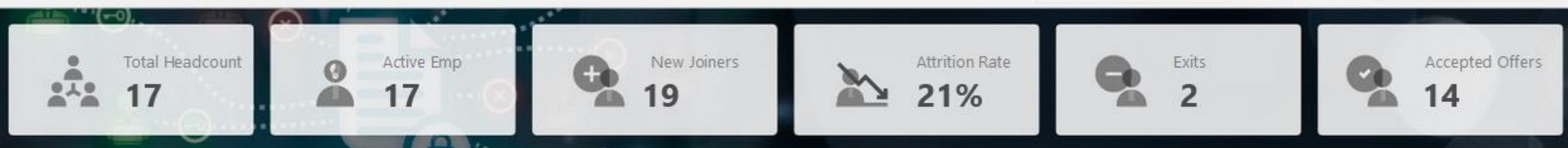
2019

Division:

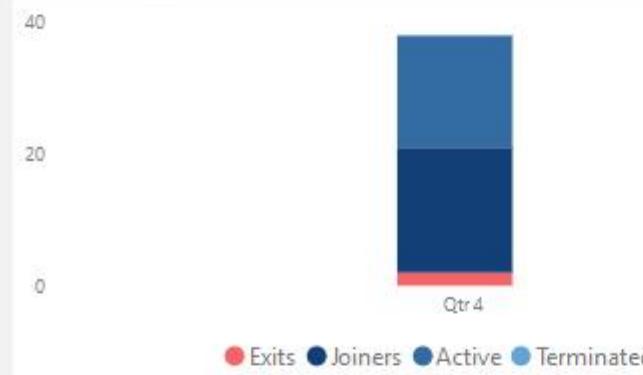
All

Department:

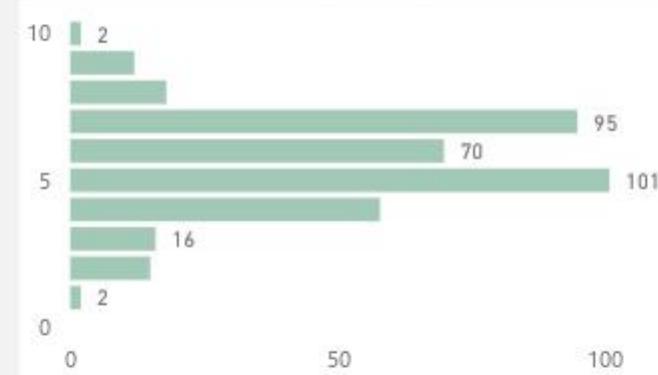
All



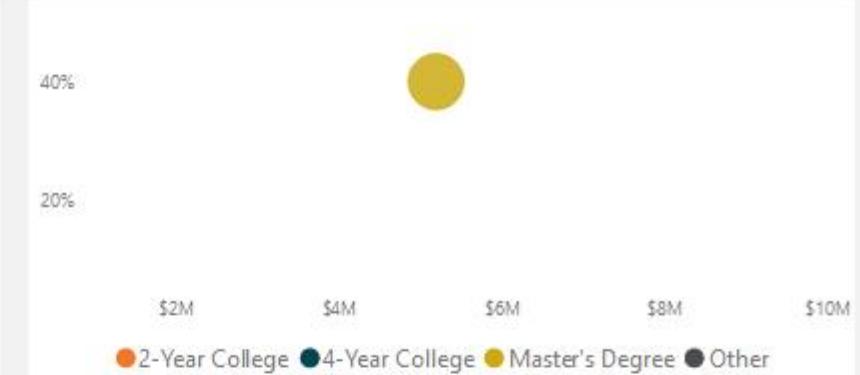
## Quarterly Headcount Details



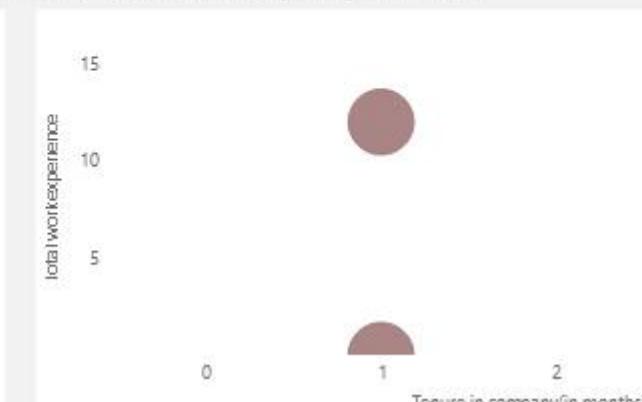
## Satisfaction Score by Employee



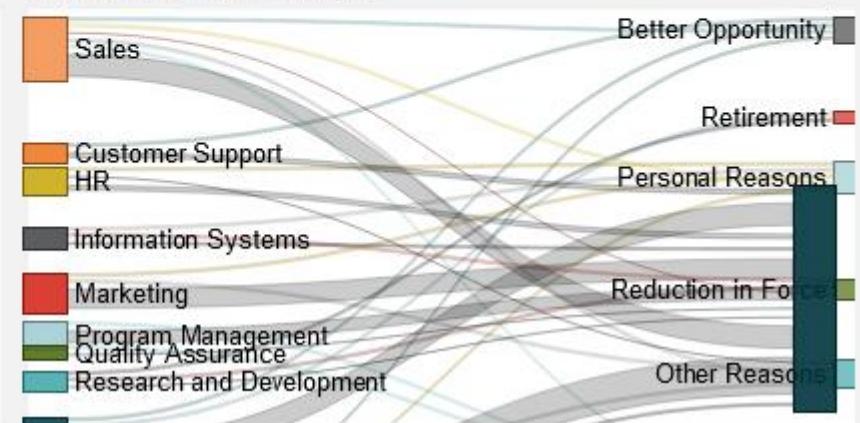
## Attrition By Education and Salary

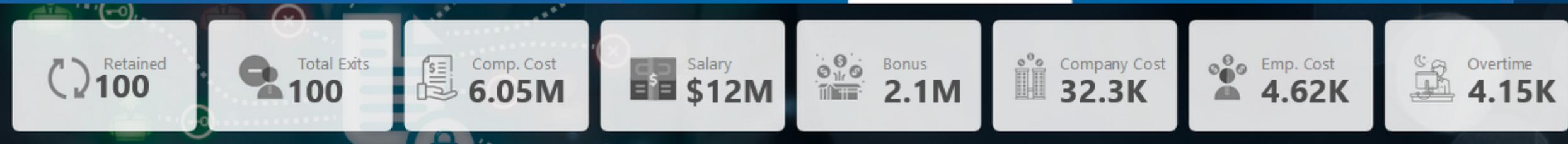


## Hiring and Vacant Position By Department Attrition Rate By Experience

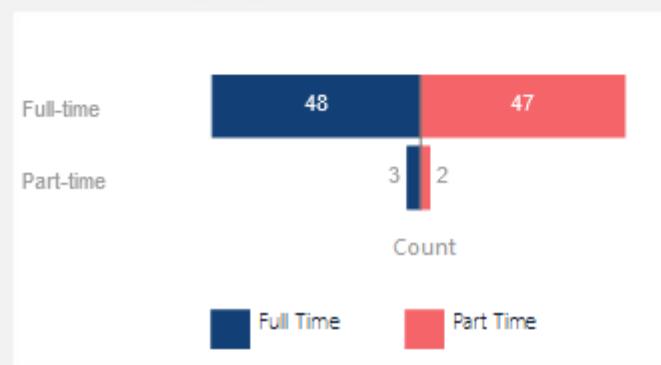


## Leave Reasons Analysis

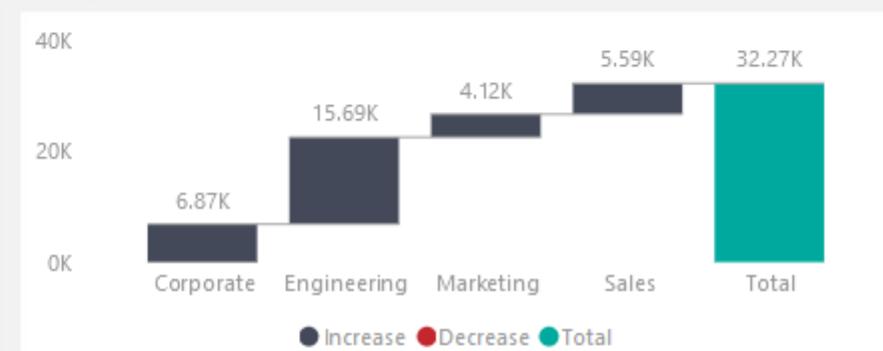




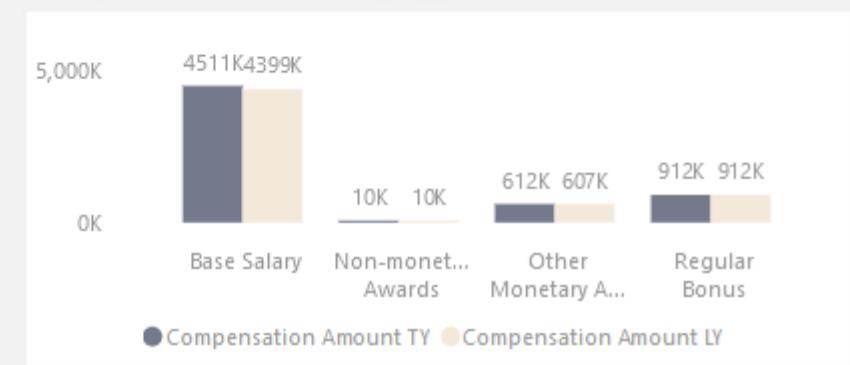
Cost to Company



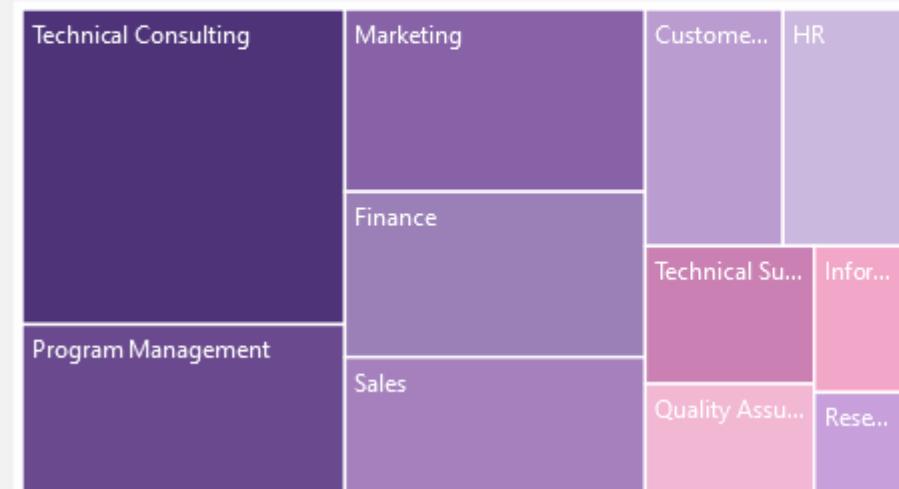
Company Cost by Division



Compensation TY &amp; LY By Type



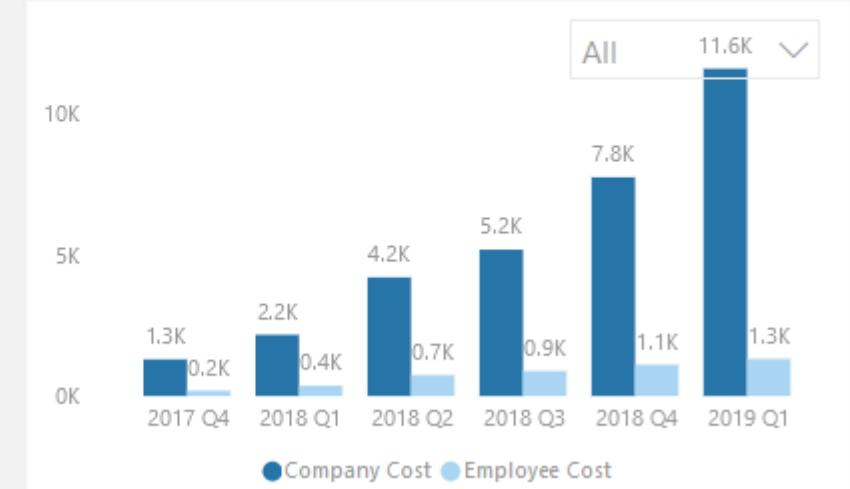
Company Cost by Department



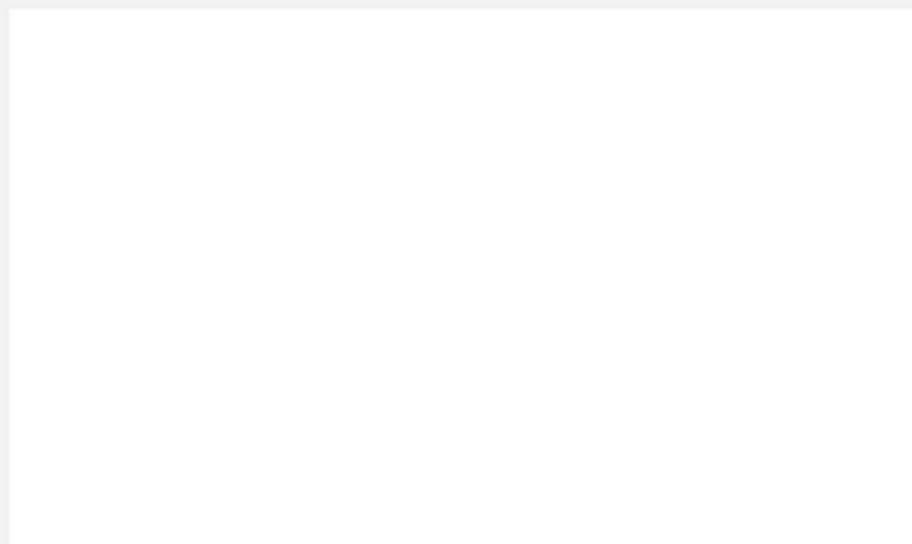
Salary by Employee Level



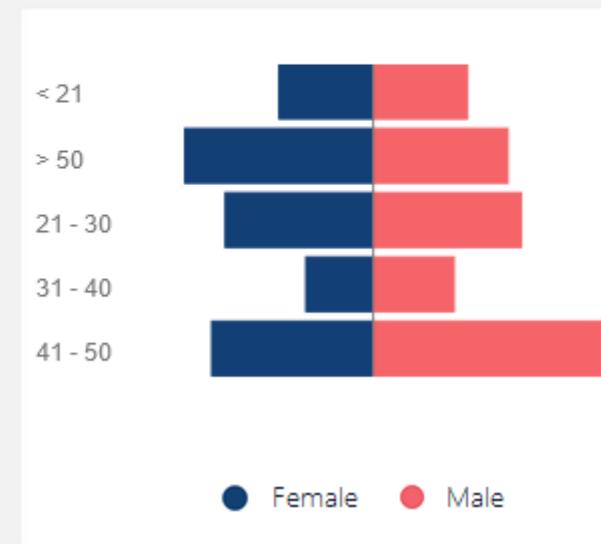
Company Cost vs Employee Cost



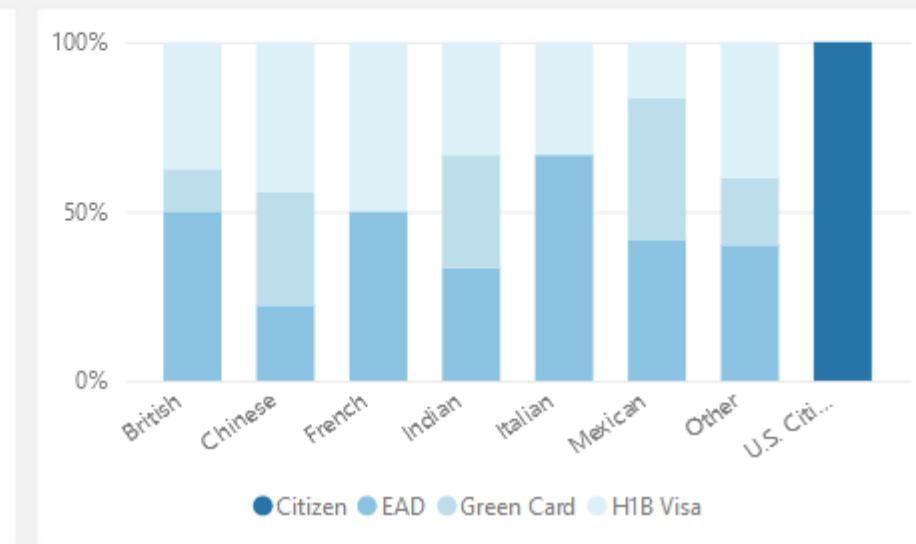
## Employee by Location



## Employee by Demography



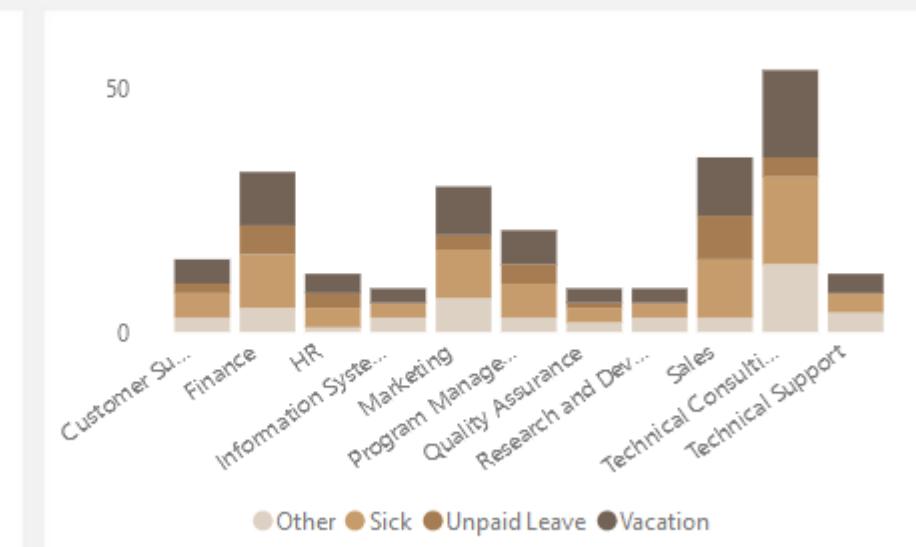
## Nationality vs EPM-IMM



## Quarterly Employee Headcounts by Departments

Quarter	Cust Support	Finance Dept	HR Dept	Info Systems	MKT Dept	Prog Mgt	Qty Assurance	R&D	SLS	Tech Consult	Tech Supp	Total
2017 Qtr 4	1	2	2		5	3			5	1		19
2018 Qtr 1	1	3	1	1	1	1	1	1	6	5		20
2018 Qtr 2	2	3	2		1	2			2	3	1	16
2018 Qtr 3	1	2	1	2	1	2		1	1	6	2	19
2018 Qtr 4		4	1	1			2	3	2	3	2	18
2019 Qtr 1		1		1	4				1	1		8
<b>Total</b>	<b>5</b>	<b>15</b>	<b>7</b>	<b>5</b>	<b>12</b>	<b>8</b>	<b>3</b>	<b>4</b>	<b>17</b>	<b>19</b>	<b>5</b>	<b>100</b>

## Total Absenteeism by Department and Leave Type





Select Employee:

Aldona Harlan



## Performance Rating



3.0

## Leave Utilization %

154.53%

## Annual Leave


● Annual Leave Remaining ● Annual Leave Taken

## Personal Information

Employee Name	Aldona Harlan
Date of Birth	Saturday, December 30, 1961
Date of Hire	Thursday, October 16, 2014
Education	2-Year College

## Current Position

Department	Customer Support
Position	Account Executive
Location	Boston
Contract Type	Full-time

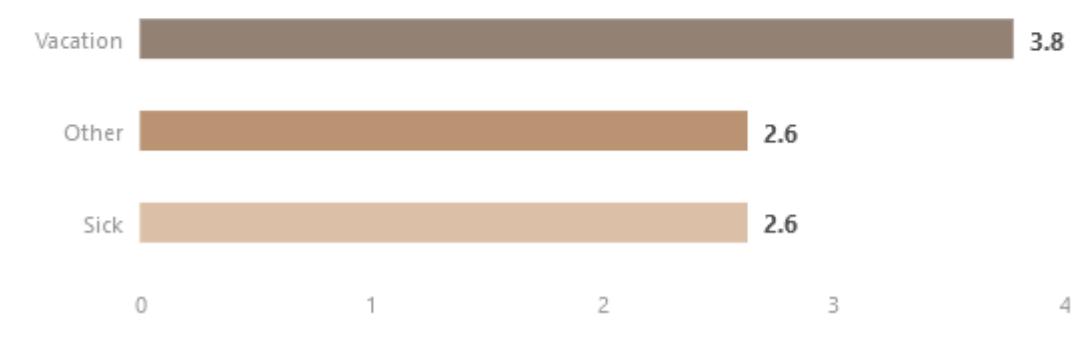
## Financial Details

Salary	\$110,000.00
Bonus	21,000.00

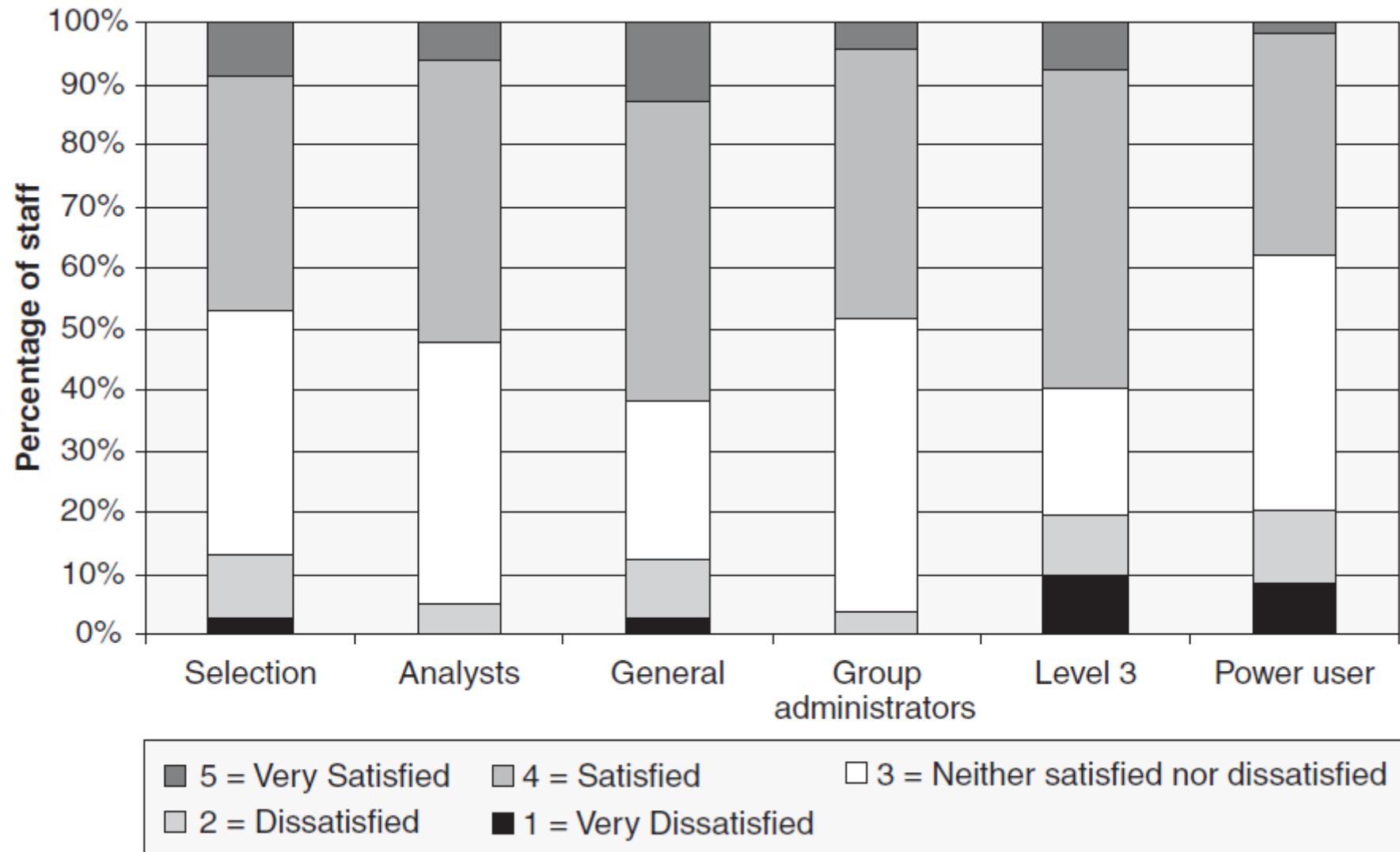
## Satisfaction Score by Survey Field



## Absenteeism by Leave Reason

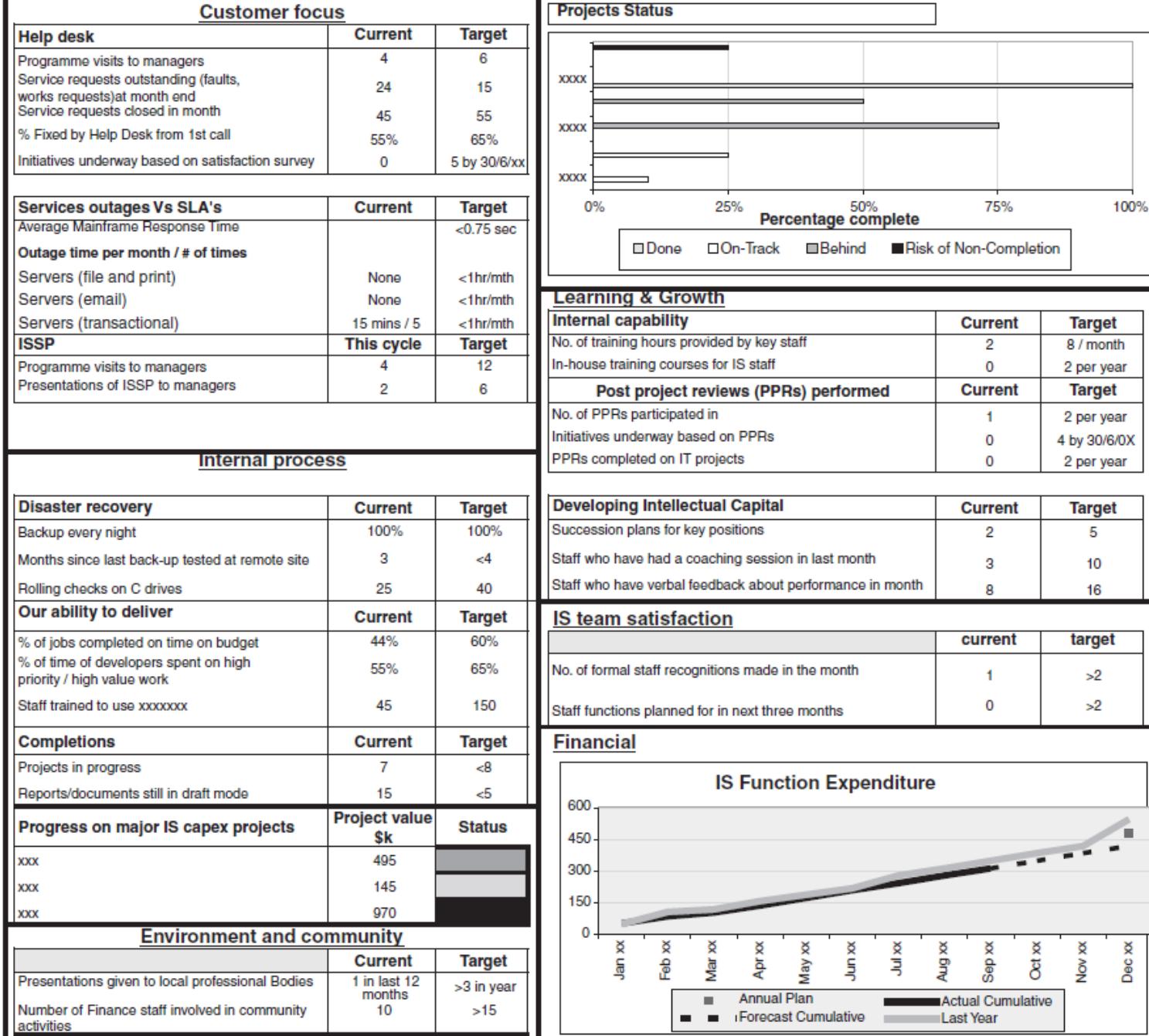


# Satisfaction Survey Results

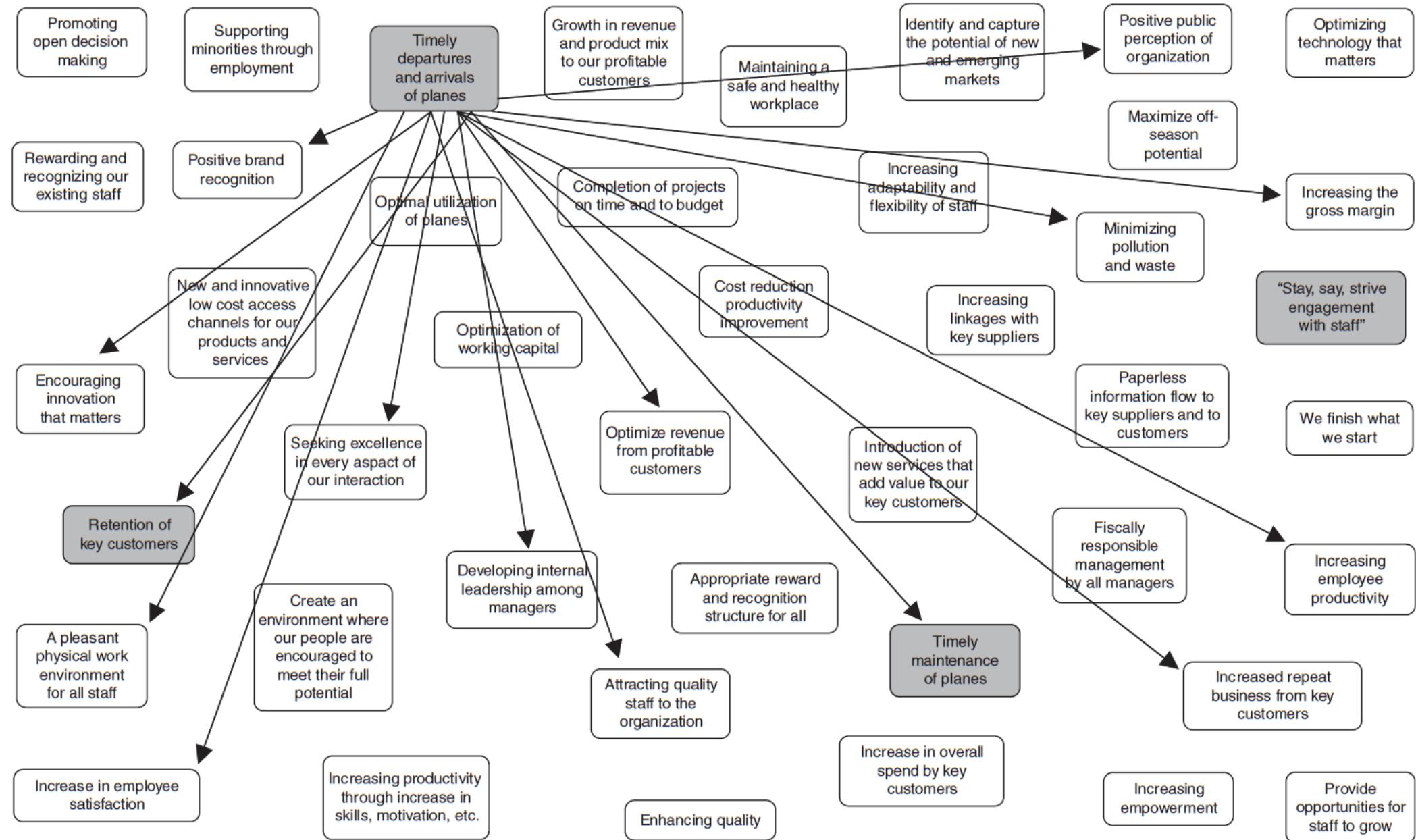


# Scorecard

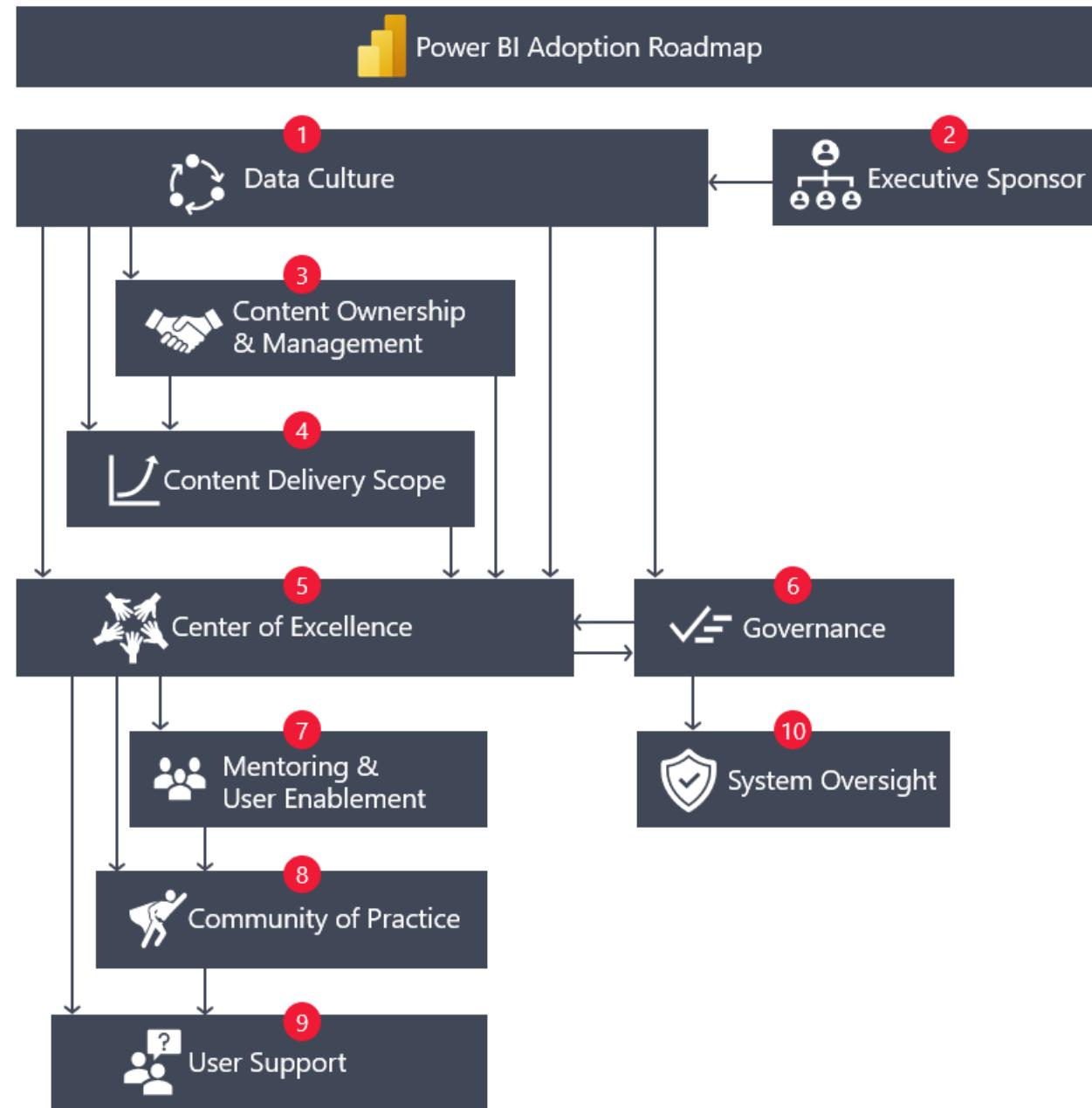
IS Team's Scorecard



# CSF Relationship mapping (Critical Success Factor)



# Power BI adoption roadmap



# Power BI adoption roadmap

Area 1. Data culture: Data culture refers to a set of behaviors and norms in the organization that encourages a data-driven culture. Building a data culture is closely related to adopting Power BI, and it's often a key aspect of an organization's digital transformation.

Area 2. Executive sponsor: An executive sponsor is someone with credibility, influence, and authority throughout the organization. They advocate for building a data culture and adopting Power BI.

Area 3. Content ownership and management: There are three primary strategies for how business intelligence (BI) content is owned and managed: business-led self-service BI, managed self-service BI, and enterprise BI. These strategies have a significant influence on adoption, governance, and the Center of Excellence (COE) operating model.

Area 4. Content delivery scope: There are four primary strategies for content delivery including personal BI, team BI, departmental BI, and enterprise BI. These strategies have a significant influence on adoption, governance, and the COE operating model.

Area 5. Center of Excellence: A Power BI COE is an internal team of technical and business experts. These experts actively assist others who are working with data within the organization. The COE forms the nucleus of the broader community to advance adoption goals that are aligned with the data culture vision.

Area 6. Governance: Data governance is a set of policies and procedures that define the ways in which an organization wants data to be used. When adopting Power BI, the goal of governance is to empower the internal user community to the greatest extent possible, while adhering to industry, governmental, and contractual requirements and regulations.

Area 7. Mentoring and user enablement: A critical objective for adoption efforts is to enable users to accomplish as much as they can within the guardrails established by governance guidelines and policies. The act of mentoring users is one of the most important responsibilities of the COE. It has a direct influence on adoption efforts.

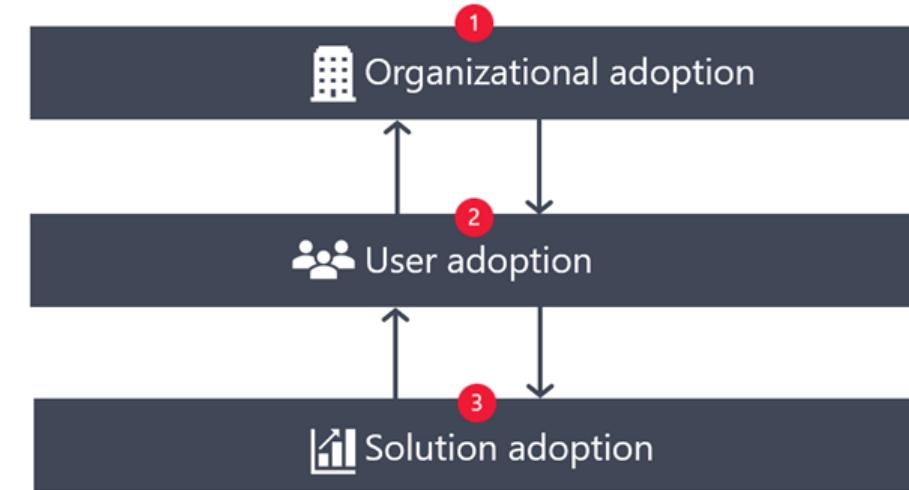
Area 8. Community of practice: A community of practice comprises a group of people with a common interest, who interact with and help each other on a voluntary basis. An active community is an indicator of a healthy data culture. It can significantly advance adoption efforts.

Area 9. User support: User support includes both informally organized, and formally organized, methods of resolving issues and answering questions. Both formal and informal support methods are critical for adoption.

Area 10. System oversight: System oversight includes the day-to-day administration responsibilities to support the internal processes, tools, and people.

# Power BI adoption roadmap maturity levels

- **Organizational adoption:** Organizational adoption refers to the effectiveness of Power BI governance. It also refers to data management practices that support and enable business intelligence efforts.
- **User adoption:** User adoption is the extent to which consumers and creators continually increase their knowledge. It's concerned with whether they're actively using Power BI, and whether they're using it in the most effective way.
- **Solution adoption:** Solution adoption refers to the impact and business value achieved for individual requirements and Power BI solutions.
- As the four arrows in the previous diagram indicate, the three types of adoption are all strongly inter-related:
  - **Solution adoption affects user adoption.** A well-designed and well-managed solution—which could be many things, such as a set of reports, an app, or a dataset—impacts and guides users on how to use Power BI in an optimal way.
  - **User adoption impacts organizational adoption.** The patterns and practices used by individual users influence organizational adoption decisions, policies, and practices.
  - **Organizational adoption influences user adoption.** Effective organizational practices—including mentoring, training, support, and community—encourage users to do the right thing in their day-to-day workflow.
  - **User adoption affects solution adoption.** Stronger user adoption, because of the effective use of Power BI by educated and informed users, contributes to stronger and more successful individual solutions.



Organizational adoption measures the state of Power BI governance and data management practices. There are several organizational adoption goals:

- Effectively support the community
- Enable and empower users
- Oversee information delivery via enterprise BI and self-service BI with continuous improvement cycles

It's helpful to think about organizational adoption from the perspective of a maturity model.

# Organizational adoption maturity levels

- **Maturity level 100 – Initial**
  - Level 100 is referred to as *initial* or *performed*. It's the starting point for new data-related investments that are new, undocumented, and without any process discipline.
  - Common characteristics of maturity level 100 include:
    - Pockets of success and experimentation with Power BI exist in one or more areas of the organization.
    - Achieving quick wins has been a priority, and it has delivered some successes.
    - Organic growth has led to the lack of a coordinated strategy or governance approach.
    - Practices are undocumented, with significant reliance on tribal knowledge.
    - There are few formal processes in place for effective data management.
    - Risk exists due to a lack of awareness of how data is used throughout the organization.
    - The potential for a strategic investment with Power BI is acknowledged, but there's no clear path forward for purposeful, organization-wide execution.
- **Maturity level 200 – Repeatable**
  - Level 200 is referred to as *repeatable* or *managed*. At this point on the maturity curve, data management is planned and executed. Data management is based on defined processes, though these processes may not apply uniformly throughout the organization.
- Common characteristics of maturity level 200 include:
  - Certain Power BI content is now critical in importance and/or it's broadly used by the organization.
  - There are attempts to document and define repeatable practices, however efforts are siloed, reactive, and deliver varying levels of success.
  - There's an over-reliance on individuals having good judgment and adopting healthy habits that they learned on their own.
  - Power BI adoptions continues to grow organically and produces value. However, it takes place in an uncontrolled way.
  - Resources for an internal community are established, such as a Teams channel or Yammer group.
  - Initial planning for a consistent Power BI governance strategy is underway.
  - There's recognition that a Power BI Center of Excellence (COE) can deliver value.
- **Maturity level 300 – Defined**
  - Level 300 is referred to as *defined*. At this point on the maturity curve, a set of standardized data management processes are established and consistently applied across organizational boundaries.
- Common characteristics of maturity level 300 include:
  - Measurable success is achieved for the effective use of Power BI.
  - Progress is made on the standardization of repeatable practices, though less-than-optimal aspects may still exist due to early uncontrolled growth.
  - The Power BI COE is established, and it has clear goals and scopes of responsibilities.
  - The internal community gains traction with the participation of a growing number of users.
  - Power BI champions emerge in the community.
  - Initial investments in training, documentation, and resources are made.
  - An initial governance model is in place.
  - Power BI has an active and engaged executive sponsor.
  - Roles and responsibilities for all Power BI stakeholders are well understood.

# Organizational adoption maturity levels

- **Maturity level 400 – Capable**
- Level 400 is known as *capable* or *measured*. At this point on the maturity curve, data is well-managed across its entire lifecycle.
- Common characteristics of maturity level 400 include:
  - Business intelligence efforts deliver significant value.
  - Power BI is commonly used for delivering critical content throughout the organization.
  - There's an established and accepted governance model with cooperation from all key business units.
  - Training, documentation, and resources are readily available for, and actively used by, the Power BI community of users.
  - Standardized processes are in place for the oversight and monitoring of Power BI usage and practices.
  - The Power BI COE includes representation from all key business units.
  - A Power BI champions network supports the internal community: champions actively work with their colleagues and the COE.
- **Maturity level 500 – Efficient**
- Level 500 is known as *efficient* or *optimizing* because at this point on the maturity curve, the emphasis is now on automation and continuous improvement.
- Common characteristics of maturity level 500 include:
  - The value of Power BI solutions is prevalent in the organization, and Power BI is widely accepted throughout the organization.
  - Power BI skillsets are highly valued in the organization, and they're recognized by leadership.
  - The internal Power BI community is self-sustaining, with support from the COE. The community isn't over-reliant on key individuals.
  - The COE reviews key performance indicators regularly to measure success of implementation and adoption goals.
  - Continuous improvement is a continual priority.
  - Use of automation adds value, improves productivity, or reduces risk for error.

# User adoption stages

- **User adoption stage 1 – Awareness**
  - Common characteristics of stage 1 user adoption include:
  - An individual has heard of, or been initially exposed to, Power BI in some way.
  - An individual may have access to Power BI but isn't yet actively using it.
- **User adoption stage 2 – Understanding**
  - Common characteristics of stage 2 user adoption include:
  - An individual develops understanding of the benefits of Power BI to deliver analytical value and support decision-making.
  - An individual shows interest and starts to use Power BI.
- **User adoption stage 3 – Momentum**
  - Common characteristics of stage 3 user adoption include:
  - An individual actively gains Power BI skills by attending formal training, self-directed learning, or experimentation.
  - An individual gains basic competency with the aspects of Power BI relevant to their role.
- **User adoption stage 4 – Proficiency**
  - Common characteristics of stage 4 user adoption include:
  - An individual actively uses Power BI regularly.
  - An individual understands how to use Power BI in the way in which it was intended, as relevant for their role.
  - An individual modifies their behavior and activities to align with organizational governance processes.
  - An individual's willingness to support organizational processes and change efforts is growing over time, and they become an advocate for Power BI in the organization.
  - An individual makes the effort to continually improve their skills and stay current with new product capabilities and features.
- It's easy to underestimate the effort it takes to progress from stage 2 (understanding) to stage 4 (proficiency).
- Typically, it takes the longest time to progress from stage 3 (momentum) to stage 4 (proficiency).
- By the time a user reaches the momentum and proficiency stages, the organization needs to be ready to support them in their efforts. You can consider some proactive efforts to encourage users to progress through stages.

# Solution adoption phases

- **Solution phase 1 – Exploration**
- Common characteristics of phase 1 solution adoption include:
  - Exploration and experimentation are the main approaches to testing out new ideas. Exploration of new ideas can occur through informal self-service BI, or through a formal proof of concept (POC), which is purposely narrow in scope. The goal is to confirm requirements, validate assumptions, address unknowns, and mitigate risks.
  - A small group of users test the proof of concept solution and provide useful feedback.
  - All exploration—and initial feedback—could occur within Power BI Desktop or Excel. Use of the Power BI service is limited.
- **Solution phase 2 – Functional**
- Common characteristics of phase 2 solution adoption include:
  - The solution is functional and meets the basic set of user requirements. There are likely plans to iterate on improvements and enhancements.
  - The solution is deployed to the Power BI service.
  - All necessary supporting components are in place, such as gateways to support scheduled refresh.
  - Users are aware of the solution and show interest in using it. Potentially, it may be a limited preview release, and may not yet be ready to promote to a production [workspace](#).

# Solution adoption phases

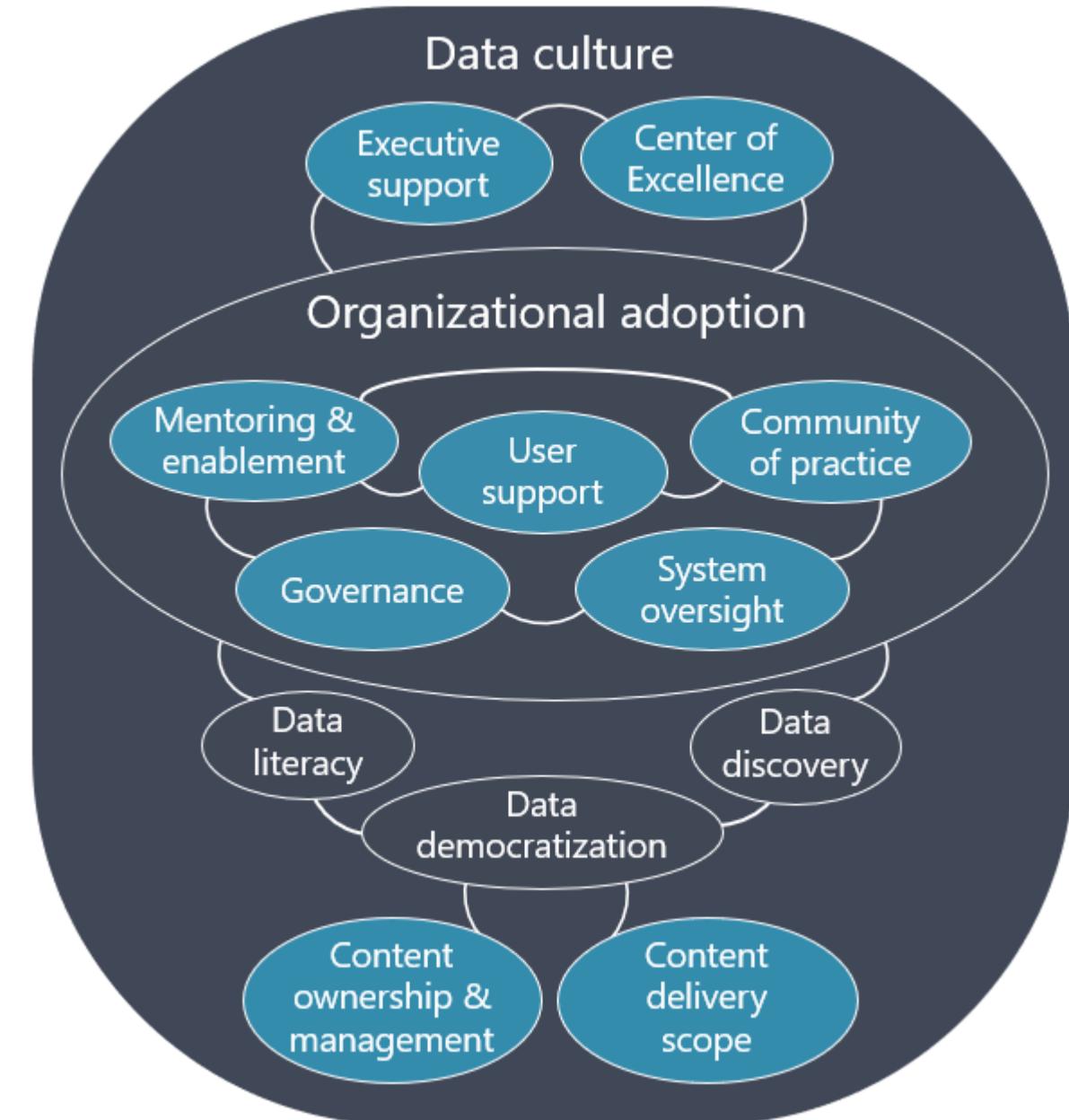
- **Solution phase 3 – Valuable**
- Common characteristics of phase 3 solution adoption include:
  - Target users find the solution is valuable and experience tangible benefits.
  - The solution is promoted to a production [workspace](#).
  - Validations and testing occur to ensure data quality, accurate presentation, accessibility, and acceptable performance.
  - Content is [endorsed](#), when appropriate.
  - Usage metrics for the solution are actively monitored.
  - User feedback loops are in place to facilitate suggestions and improvements that can contribute to future releases.
  - Solution documentation is generated to support the needs of information consumers (such as data sources used or how metrics are calculated), and help future creators (such as documenting any future maintenance or planned enhancements).
  - Ownership and subject matter experts for the content is clear.
  - Report branding and theming are in place, and they're inline with governance guidelines.
- **Solution phase 4 – Essential**
- Common characteristics of phase 4 solution adoption include:
  - Target users actively and routinely use the solution, and it's considered essential for decision-making purposes.
  - The solution resides in a [production workspace](#) well-separated from development and test content. Change management and release management are carefully controlled due to the impact of changes.
  - A subset of users regularly provides feedback to ensure the solution continues to meet requirements.
  - Expectations for the success of the solution are clear and are measured.
  - Expectations for support of the solution are clear, especially if there are service level agreements.
  - The solution aligns with organizational governance guidelines and practices.
  - Most content is [certified](#) since it's critical in nature.
  - Formal user acceptance testing for new changes may occur, particularly for IT-managed content.

# Power BI adoption roadmap: Data culture

- Building a data culture is closely related to adopting Power BI, and it's often a key aspect of an organization's digital transformation.
- The term *data culture* can be defined in different ways by different organizations. In this series of articles, data culture means a set of behaviors and norms in an organization.
- It encourages a culture that regularly employs informed data decision-making:
  - By more stakeholders throughout more areas of the organization.
  - Based on analytics, not opinion.
  - In an effective, efficient way that's based on best practices endorsed by the [Center of Excellence \(COE\)](#).
  - Based on trusted data.
  - That reduces reliance on undocumented tribal knowledge.
  - That reduces reliance on hunches and gut decisions.
- **Important**
  - Think of data culture as what you do, not what you say. Your data culture is not a set of rules (that's governance). So, data culture is a somewhat abstract concept. It's the behaviors and norms that are allowed, rewarded, and encouraged—or those that are disallowed and discouraged. Bear in mind that a healthy data culture motivates employees at all levels of the organization to generate and distribute actionable knowledge.

# Power BI adoption roadmap: Data culture

- Within an organization, certain business units or teams are likely to have their own behaviors and norms for getting things done. The specific ways to achieve data culture objectives can vary across organizational boundaries. What's important is that they should all align with the organizational data culture objectives. You can think of this structure as *aligned autonomy*.
- The following circular diagram conveys the interrelated aspects that influence your data culture:
- The diagram represents the somewhat ambiguous relationships among the following items:
  - Data culture is the outer circle. All topics within it contribute to the state of the data culture.
  - Organizational adoption (including the implementation aspects of mentoring and user enablement, user support, community of practice, governance, and system oversight) is the inner circle. All topics are major contributors to the data culture.
  - Executive support and the Center of Excellence are drivers for the success of organizational adoption.
  - Data literacy, data democratization, and data discovery are data culture aspects that are heavily influenced by organizational adoption.
  - Content ownership, content management, and content delivery scope are closely related to data democratization.
- The elements of the diagram are discussed throughout this series of articles.



# Data Culture Maturity levels

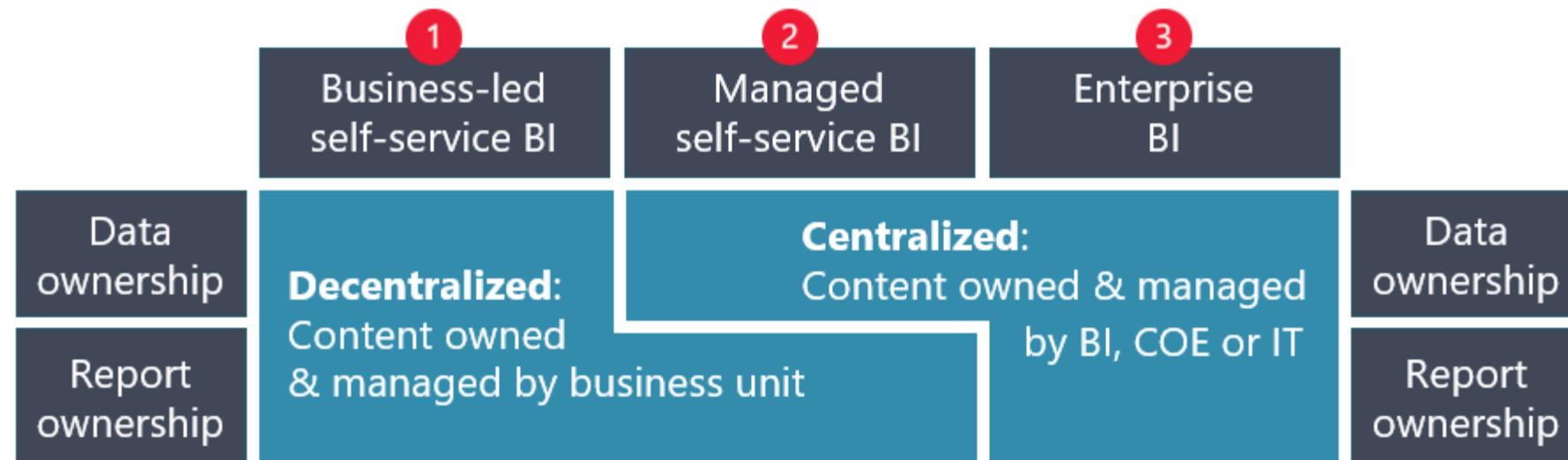
Level	State of data culture
100: Initial	<p>The enterprise BI team can't keep up with the needs of the business. A significant backlog of requests exists for the enterprise BI team.</p> <p>Self-service BI initiatives are taking place—with some successes—in various areas of the organization. These activities are occurring in a somewhat chaotic manner, with few formal processes and no strategic plan.</p> <p>There's a lack of oversight and visibility into self-service BI activities. The successes or failures of BI solutions aren't well understood.</p>
200: Repeatable	<p>Multiple teams have had measurable successes with self-service BI solutions. People in the organization are starting to pay attention.</p> <p>Investments are being made to identify the ideal balance of enterprise BI and self-service BI.</p>
300: Defined	<p>Specific goals are established for advancing the data culture. These goals are implemented incrementally.</p> <p>Learnings from what works in individual business units is shared.</p> <p>Effective self-service BI practices are incrementally—and purposely—replicated throughout more areas of the organization.</p>
400: Capable	<p>The data culture goals to employ informed decision-making are aligned with organizational objectives. They're actively supported by the executive sponsor, the COE, and they have a direct impact on adoption strategies.</p> <p>A healthy and productive partnership exists between the executive sponsor, COE, business units, and IT. The teams are working towards shared goals.</p> <p>Individuals who take initiative in building valuable BI solutions are recognized and rewarded.</p>
500: Efficient	<p>The business value of BI solutions is regularly evaluated and measured. KPIs or OKRs are used to track data culture goals and the results of BI efforts.</p> <p>Feedback loops are in place, and they encourage ongoing data culture improvements.</p> <p>Continual improvement of organizational adoption, user adoption, and solution adoption is a top priority.</p>

# current state of executive support maturity level

Level	State of Power BI executive support
100: Initial	There may be awareness from at least one executive about the strategic importance of how Power BI can play a part in advancing the organization's data culture goals. However, neither a Power BI sponsor nor an executive-level decision-maker is identified.
200: Repeatable	Informal executive support exists for Power BI through informal channels and relationships.
300: Defined	An executive sponsor is identified. Expectations are clear for the role.
400: Capable	An executive sponsor is well established with someone with sufficient authority across organizational boundaries.  A healthy and productive partnership exists between the executive sponsor, COE, business units, and IT. The teams are working towards shared data culture goals.
500: Efficient	The executive sponsor is highly engaged. They're a key driver for advancing the organization's data culture vision.  The executive sponsor is involved with ongoing organizational adoption improvements. KPIs (key performance indicators) or OKRs (objectives and key results) are used to track data culture goals and the results of BI efforts.

# Power BI adoption roadmap: Content ownership and management

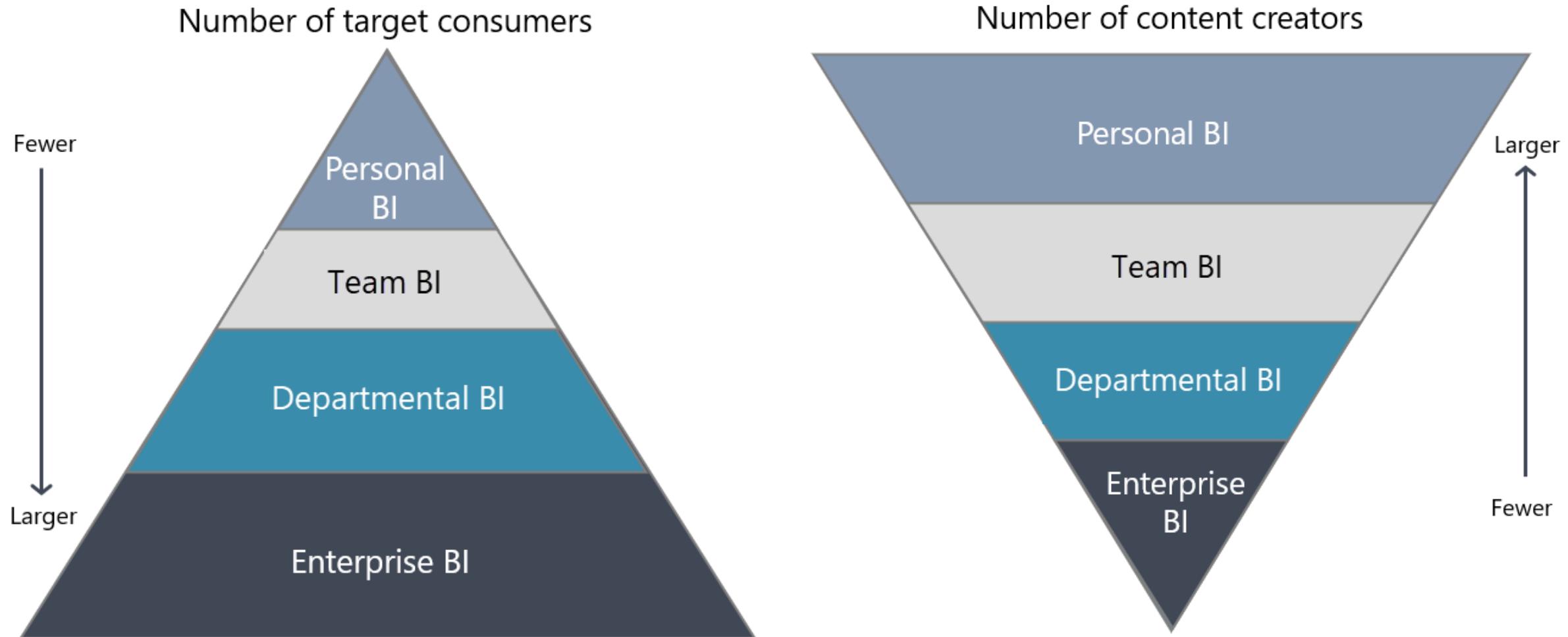
- There are three primary strategies for how business intelligence (BI) content is owned and managed: business-led self-service BI, managed self-service BI, and enterprise BI. For the purposes of this series of articles, the term *content* refers to any type of data item (like a report or dashboard). It's synonymous with *solution*.
- The organization's data culture is the driver for why, how, and by whom each of these three content ownership strategies is implemented.
  - **Business-led self-service BI:** All content is owned and managed by the creators and subject matter experts within a business unit. This ownership strategy is also known as a *decentralized* or *bottom-up BI* strategy.
  - **Managed self-service BI:** The data is owned and managed by a centralized team, whereas business users take responsibility for reports and dashboards. This ownership strategy is also known as *discipline at the core and flexibility at the edge*.
  - **Enterprise BI:** All content is owned and managed by a centralized team such as IT, enterprise BI, or the Center of Excellence (COE).



# Assess the current state of your content ownership and management

Level	State of Power BI content ownership and management
100: Initial	<p>Self-service content creators own and manage content in an uncontrolled way, without a specific strategy.</p> <p>A high ratio of datasets to reports exists. When many datasets only support one report, it indicates opportunities to improve data reusability, improve trustworthiness, reduce maintenance and the number of duplicate datasets.</p> <p>Discrepancies between different reports is common, causing distrust of content produced by others.</p>
200: Repeatable	<p>A plan is in place for which content ownership and management strategy to use and in which circumstances.</p> <p>Initial steps are taken to improve the consistency and trustworthiness levels for self-service BI efforts.</p> <p>Guidance for the user community is available that includes expectations for self-service versus enterprise content.</p> <p>Roles and responsibilities are clear and well understood by everyone involved.</p>
300: Defined	<p>Managed self-service BI is a priority and an area of investment to further advance the data culture. The priority is to allow report creators the flexibility they need while using well-managed, secure, and trustworthy data sources.</p> <p>Report branding is consistently used to indicate who produced the content.</p> <p>A <a href="#">mentoring program</a> exists to educate self-service content creators on how to apply best practices and make good decisions.</p>
400: Capable	<p>Criteria is defined to align governance requirements for self-service versus enterprise content.</p> <p>There's a plan in place for how to request and handle ownership transfers.</p> <p>Managed self-service BI—and techniques for the reuse of data—are commonly used and well-understood.</p>
500: Efficient	<p>Proactive steps to communicate with users occur when any concerning activities are detected in the activity log. Education and information are provided to make gradual improvements or reduce risk.</p> <p>Third-party tools are used by highly proficient content creators to improve productivity and efficiency.</p>

# Scope of content delivery



# Power BI adoption roadmap: Center of Excellence

- Goals for a COE include:
  - Evangelizing a data-driven culture.
  - Promoting the adoption of Power BI.
  - Nurturing, mentoring, guiding, and educating internal users to increase their skills and level of self-reliance.
  - Coordinating efforts and disseminating knowledge across organizational boundaries.
  - Creating consistency and transparency for the user community, which reduces friction and pain points related to finding relevant data and analytics content.
  - Maximizing the benefits of self-service BI, while reducing the risks.
  - Reducing technical debt by helping make good decisions that increase consistency and result in fewer inefficiencies.

# Power BI adoption roadmap: Center of Excellence

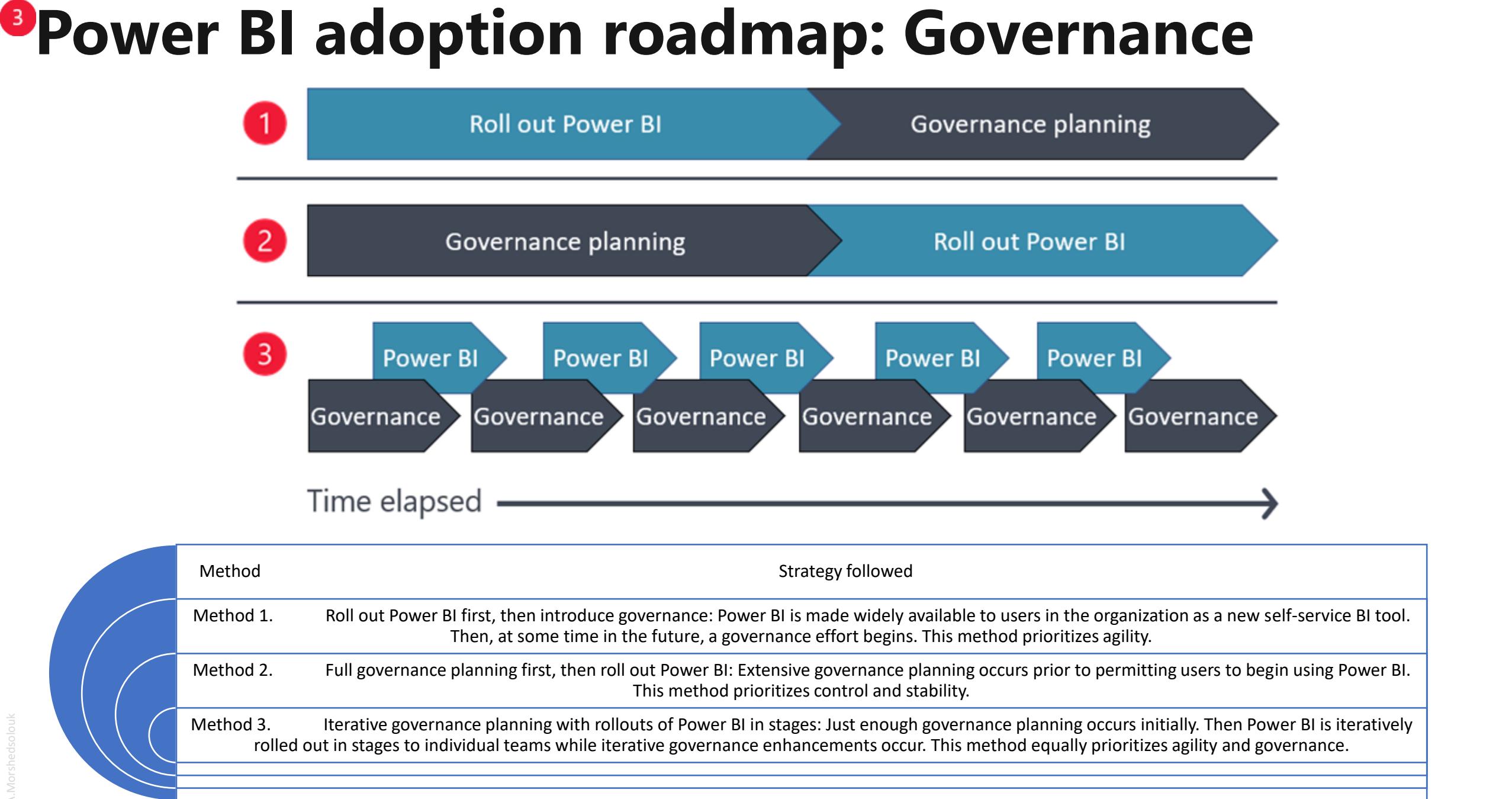
- **Scope of COE responsibilities**
- The scope of COE responsibilities can vary significantly between organizations. In a way, a COE can be thought of as a consultancy service because its members routinely provide expert advice to others. To varying degrees, most COEs handle hands-on work too.
- Common COE responsibilities include:
  - Mentoring the internal Power BI community. For more information, see the [Community of practice](#) article.
  - Producing, curating, and promoting training materials. For more information, see the [Mentoring and user enablement](#) article.
  - Creating documentation and resources to encourage consistent use of standards and best practices. For more information, see the [Mentoring and user enablement](#) article.
  - Applying, communicating, and assisting with governance guidelines. For more information, see the [Governance](#) article.
  - Handling and assisting with system oversight and administration. For more information, see the [System oversight](#) article.
  - Responding to user support issues escalated from the help desk. For more information, see the [User support](#) article.
  - Developing solutions and/or proofs of concept.
  - Establishing and maintaining the BI platform and data architecture.

# Power BI adoption roadmap: Center of Excellence

- **Staffing a COE**
- People who are good candidates as COE members tend to be those who:
  - Understand the analytics vision for the organization.
  - Have a desire to continually improve analytics practices for the organization.
  - Have a deep interest in, and expertise with, Power BI.
  - Are interested in seeing Power BI used effectively and adopted successfully throughout the organization.
  - Take the initiative to continually learn, adapt, and grow.
  - Readily share their knowledge with others.
  - Are interested in repeatable processes, standardization, and governance with a focus on user enablement.
  - Are hyper-focused on collaboration with others.
  - Are comfortable working in an agile fashion.
  - Have an inherent interest in being involved and helping others.
  - Can effectively translate business needs into solutions.
  - Communicate well with both technical and business colleagues.

# CEO: Roles and responsibilities

Role	Description
COE leader	Manages the day-to-day operations of the COE. Interacts with the executive sponsor and other organizational teams, such as the data governance board, as necessary. For details of additional roles and responsibilities, see the <a href="#">Governance</a> article.
Coach	Coaches and educates others on BI skills via office hours (community engagement), best practices reviews, or co-development projects. Oversees and participates in the discussion channel of the internal community. Interacts with, and supports, the champions network.
Trainer	Develops, curates, and delivers internal training materials, documentation, and resources.
Data analyst	Domain-specific subject matter expert. Acts as a liaison between the COE and the business unit. Content creator for the business unit. Assists with content certification. Works on co-development projects and proofs of concept.
Data modeler	Creates and manages shared datasets and dataflows to support self-service content creators.
Report creator	Creates and publishes reports and dashboards.
Data engineer	Plans Power BI deployment and architecture, including integration with Azure services and other data platforms. Publishes data assets which are utilized broadly across the organization.
User support	Assists with the resolution of data discrepancies and escalated help desk support issues.

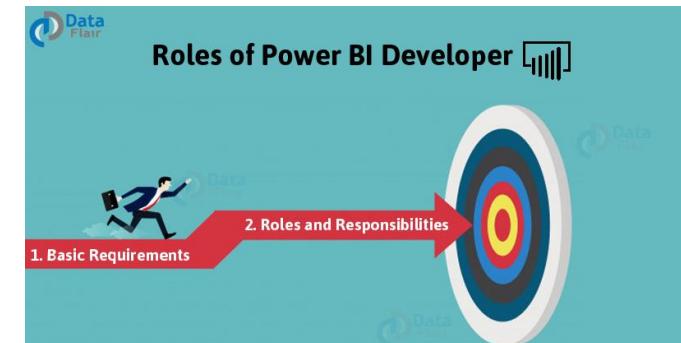


# Power BI implementation planning

- BI strategy
- User needs and opportunities
- Authoring tools and user machines
- [Tenant setup](#)
- Subscriptions, licenses, and trials
- Roles and responsibilities
- Power BI service oversight
- [Workspaces](#)
- Data management
- Content distribution and sharing
- Change management and deployment
- [Security](#)
- [Information protection and data loss prevention](#)
- Power BI Premium
- Gateways
- Integration with other services
- [Auditing and monitoring](#)
- Adoption tracking
- Scaling and growing

# Basic Requirements for a Power BI Developer

- BS/MS in Computer Science or Information System. Besides that, one needs to have considerable work experience in similar fields.
- Experience of 5+ years in data preparation, data gateway and data warehousing projects.
- Experience of 5+ years and familiarity with Microsoft Business Intelligence Stack having Power BI, SSAS, SSRS, SSIS.
- 3 to 4 years of experience working with a self-service tool, preferably Power BI or Tableau.
- Familiarity with JavaScript, CSS, and other JavaScript libraries.
- Should be familiar and experienced in SQL.

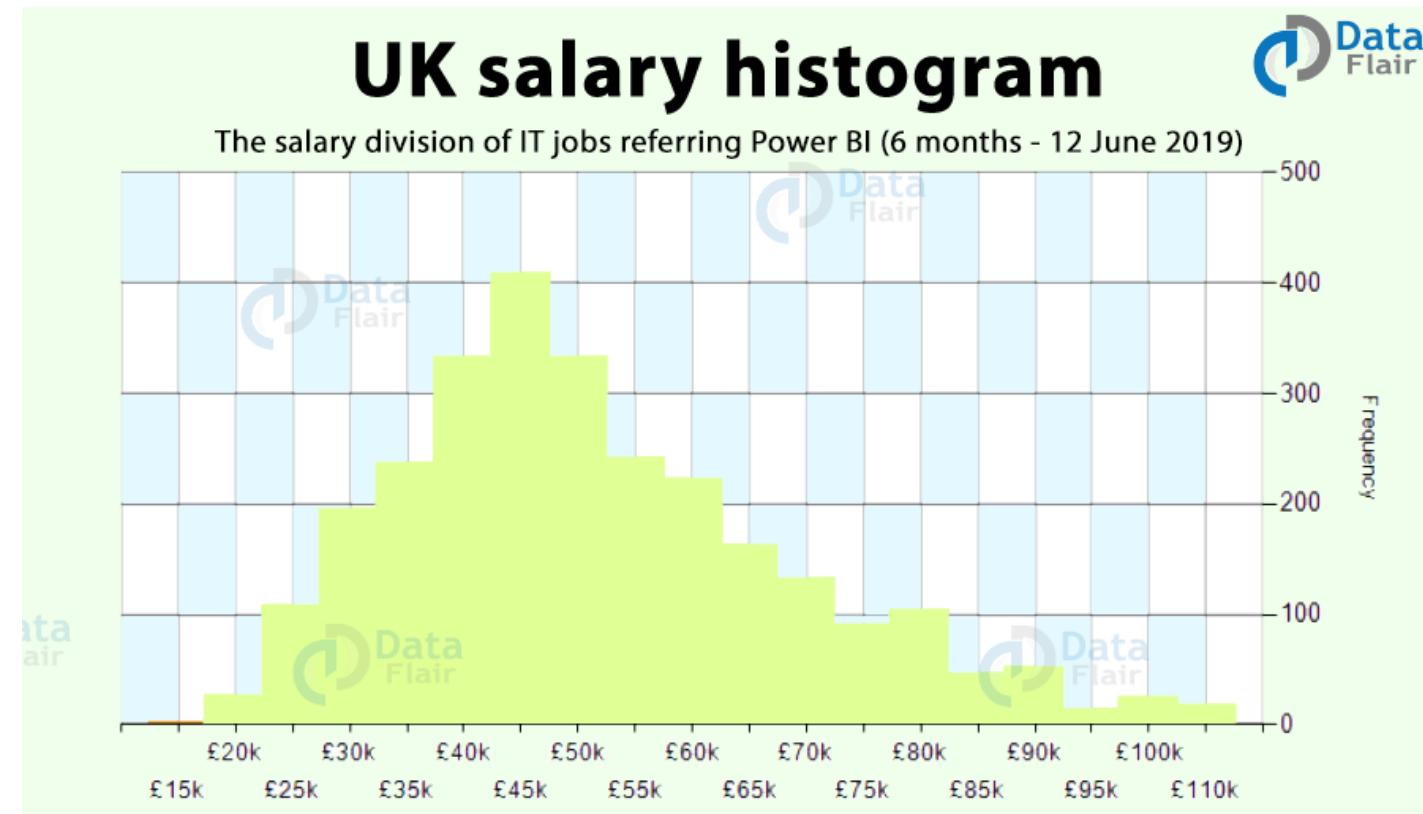


# Roles and Responsibilities of a Power BI Developer

- The main roles and responsibilities of a Power BI developer are discussed below:
- Power BI development and administration.
- Building Analysis Services reporting models.
- Developing visual reports, dashboards and KPI scorecards using Power BI desktop.
- Connecting to data sources, importing data and transforming data for Business Intelligence.
- Excellent in analytical thinking for translating data into informative visuals and reports.
- Able to implement row level security on data and have an understanding of application security layer models in [Power BI](#).
- Proficient in making [\*\*DAX queries in Power BI desktop\*\*](#).
- Expertise in using advance level calculations on the data set.
- Responsible for design methodology and project documentation.
- Able to develop tabular and multidimensional models that are compatible with warehouse standards.
- Adept in *developing, publishing and scheduling Power BI reports* as per the business requirements.
- Able to properly understand the business requirements and develop data models accordingly by taking care of the resources.
- Should have knowledge and experience in *prototyping, designing, and requirement analysis*.
- Should have knowledge and skills for secondary tools such as Microsoft Azure, SQL data warehouse, PolyBase, Visual Studio, etc.
- Able to integrate Power BI reports into other applications using embedded analytics like Power BI service (SaaS), or by API automation. Also, one must be experienced in [\*\*developing custom visuals for Power BI\*\*](#).

# Power BI Salary Estimates

- These are the salary estimates of a Power BI professional in the USA. The salary range depends on your experience level, expertise, and qualification.
- \$35,000 (Rs.24,06,180.00)
- \$52,100 (Rs.35,81,770.80)
- \$72,000 (Rs.49,49,856.00)
- \$80,900 (Rs.55,61,713.20)
- \$100,600 (Rs.69,16,048.80)



## SIGNS OF MES FAILURE VS. ASSET DATA-CENTRIC SOLUTIONS

MES PERFORMANCE FAILURE	DATA-CENTRIC SOLUTION
SCRAMBLING FOR PARTS Inaccurate parts count leads to production delays and unified orders.	SOLUTION An automated, accurate parts count preempts costly downtime. Reordering can also be fully automated.
FAILING OR BROKEN EQUIPMENT Inefficient calendar-based maintenance schedules lead to over-maintenance, which waste resources, OR under-maintenance, which results in costly machine breakages and downtime.	SOLUTION Drive maintenance systems with machine data based on usage or condition. Use data to diagnose and predict various types of failures so personal can stop disruptions from happening in the first place.
CHALLENGES ACHIEVING CONSISTENT QUALITY Reliance on manually tracked data limits ability to pinpoint the source of quality issues due to worn tools and other equipment issues.	SOLUTION Automated data collection monitor machine and tooling conditions to quickly detect and diagnose machine issues that compromises part quality, triggering work flows to people and systems that prevent parts from being scrapped or reworked.
UNEXPLAINED DOWNTIME & INCONSISTENT THROUGHPUT Undetected chronic productivity problems and manual data input errors quickly cut into narrow margins and damage customer satisfaction.	SOLUTION Intelligent, automated process data capture can eliminate error, detect trends, rapidly identify choke points, and optimize throughput.
SCHEDULING BASED ON APPROXIMATIONS Highly unpredictable equipment that varies widely by personnel hampers downstream performance.	SOLUTION Software allows you to log an anticipated setup time, automate scheduling, and alert operators if they are at risk of missing the allotted task window. Standards of work such as cycle times can be updated in real-time for accurate performance benchmarks.
DIFFICULTY WITH CUSTOMIZATION & SCALE Complicated Production flow updates and/or volume expansion lead to expensive and time consuming delays.	SOLUTION Data-centricity ensures that time and resource use are continuously optimized with tools versatile enough to implement changes and scale with minimal manual upkeep.

# BI Team Scorecard

## Elements of Success

### Adoption

Adoption has become a buzz word in our industry over the past few years, and with good reason. One could make the argument that the ability to drive adoption should take higher precedent than some of the reports themselves. For reference, we are defining adoption as the maturity, growth, and reliance an organization has on their data via Power BI.

### Value / Time

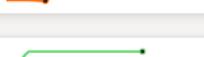
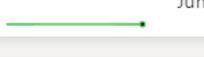
While most BI professionals do not directly create revenue, there is no question that there is a cost. With an ever increasing workload and requests for our time, the ability to validate and choose to work on impactful and value-added reports is essential. If a pro is working on one report, there are five others that are being ignored. Further, are the reports that are being developed and deployed providing the expected insights and information to an organization?

### Data Quality

Anyone who has worked in Business Intelligence can tell you – once teams lose trust in the data, it is an awfully long and difficult road to gain it back. If users cannot trust the data in Power BI reports, that both reverts adoption and users will find other means to get their data. BI teams must be able to monitor how up-to-date published reports are, and ensure that the content that is available is current and accurate.

## BI Team Scorecard

13 Goals	8 On track	1 At risk	1 Behind	2 Not started	1 Overdue	0 Completed
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Name	Owner	Status	Value	Progress	Due date	Notes
New Reports - 60 Days Views	Tommy Puglia	On track	421/350 ↑ 0% DoD		Jun 12, 2021	<a href="#">Edit</a>
▼ New Reports Launched	Tommy Puglia	On track	22/15 ↑ 0% DoD		Jun 12, 2021	<a href="#">Edit</a>
New Reports - Rolling 30 Days Views	Tommy Puglia	On track	231/170 ↑ 0% DoD		Jun 17, 2021	<a href="#">Edit</a>
New Reports - Rolling 60 Days Views	Tommy Puglia	On track	421/350 ↑ 0% DoD		Jun 17, 2021	<a href="#">Edit</a>
▼ Report Views Rolling 60	Tommy Puglia	On track	3,722/2,551 ↑ 0% DoD		Jun 12, 2021	<a href="#">Edit</a>
Report Views Rolling 30	Tommy Puglia	Behind	1,627/1,978 ↑ 0% DoD		Jun 12, 2021	<a href="#">Edit</a>
▼ Refreshes (above 95% success)	Tommy Puglia	On track	95.8%/95.0% ↑ 0% DoD		Jun 12, 2021	<a href="#">Edit</a>
Refreshes - Under 5 minutes overall avg	Tommy Puglia	Overdue	7.8/5.0 ↑ 0% DoD		Jun 12, 2021	<a href="#">Edit</a>
▼ Report Views YtD	Tommy Puglia	On track	12K/8,704 ↑ 0% DoD		Dec 30, 2021	<a href="#">Edit</a>
Report Views MtD vs. MtD PY CUR	Tommy Puglia	On track	1,715/1,585 ↑ 0% DoD		Jun 17, 2021	<a href="#">Edit</a>
Report Views MtD vs. MtD PM	Tommy Puglia	At risk	1,715/3,551 ↑ 0% DoD		Jun 17, 2021	<a href="#">Edit</a>
▼ Monthly Active Users vs PY	Tommy Puglia	Not started	97/96		Jun 19, 2021	<a href="#">Edit</a>

# Data Modeling

Concepts and How to use in PBI



# Steps for BI Implementation

Establish a BI Vision, Mission and Strategy

Assess current situation

Develop a BI roadmap and prioritize initiatives

Establish BI Governance and funding process

Establish a BI Competency Center (BICC)

Align Business and IT and BI teams

Start Data Architecture and Deploy a Data Dictionary/Master Data

Measure and track ROI/Benefits from BI

Identify CSFs, KPIs, KRIs, PIs, RIs, Metrics, Measures, Monitoring period and their Targets

Choose your BI Tools, Technology, Infra, DWH

## Identify Data Sources, start ETL and Modeling

Design and Implement BI Reports

Onboard Stakeholders and End-users

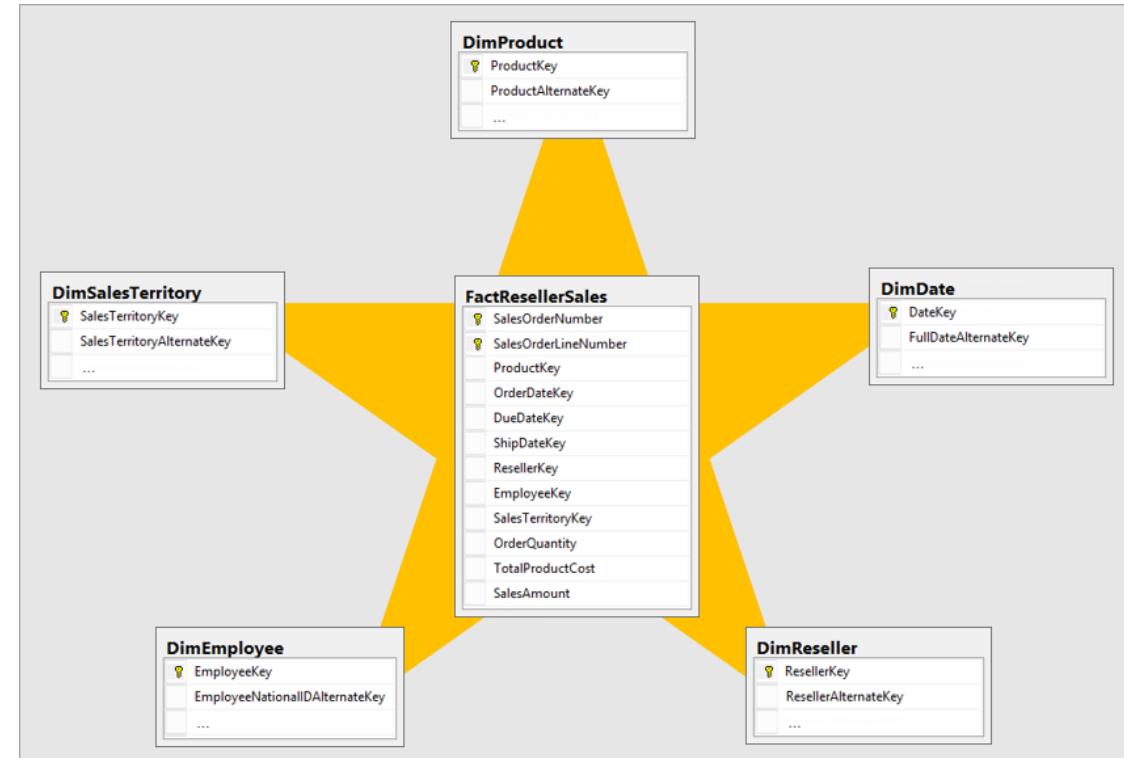
Build Trust in the system, Govern your Data

Close the Cycle by Continuous Improvement



# Understand star schema

- **Star schema** is a mature modeling approach widely adopted by relational data warehouses.
- It requires modelers to classify their model tables as either *dimension* or *fact*.
- **Dimension tables** describe business entities—the *things* you model.
  - Entities can include products, people, places, and concepts including time itself.
  - The most consistent table you'll find in a star schema is a date dimension table.
  - A dimension table contains a key column (or columns) that acts as a unique identifier, and descriptive columns.
- **Fact tables** store observations or events, and can be sales orders, stock balances, exchange rates, temperatures, etc.
  - A fact table contains dimension key columns that relate to dimension tables, and numeric measure columns.
  - The dimension key columns determine the *dimensionality* of a fact table, while the dimension key values determine the *granularity* of a fact table.
  - For example, consider a fact table designed to store sale targets that has two dimension key columns **Date** and **ProductKey**.
  - It's easy to understand that the table has two dimensions. The granularity, however, can't be determined without considering the dimension key values. In this example, consider that the values stored in the **Date** column are the first day of each month. In this case, the granularity is at month-product level.



# Normalization vs. denormalization

- *Normalization*

- is the term used to describe data that's stored in a way that reduces repetitive data.
- Consider a table of products that has a unique key value column, like the product key, and additional columns describing product characteristics, including product name, category, color, and size.
- A sales table is considered normalized when it stores only keys, like the product key. In the following image, notice that only the **ProductKey** column records the product.

- If, however, the sales table stores product details beyond the key, it's considered *denormalized*.

- In the following image, notice that the **ProductKey** and other product-related columns record the product.

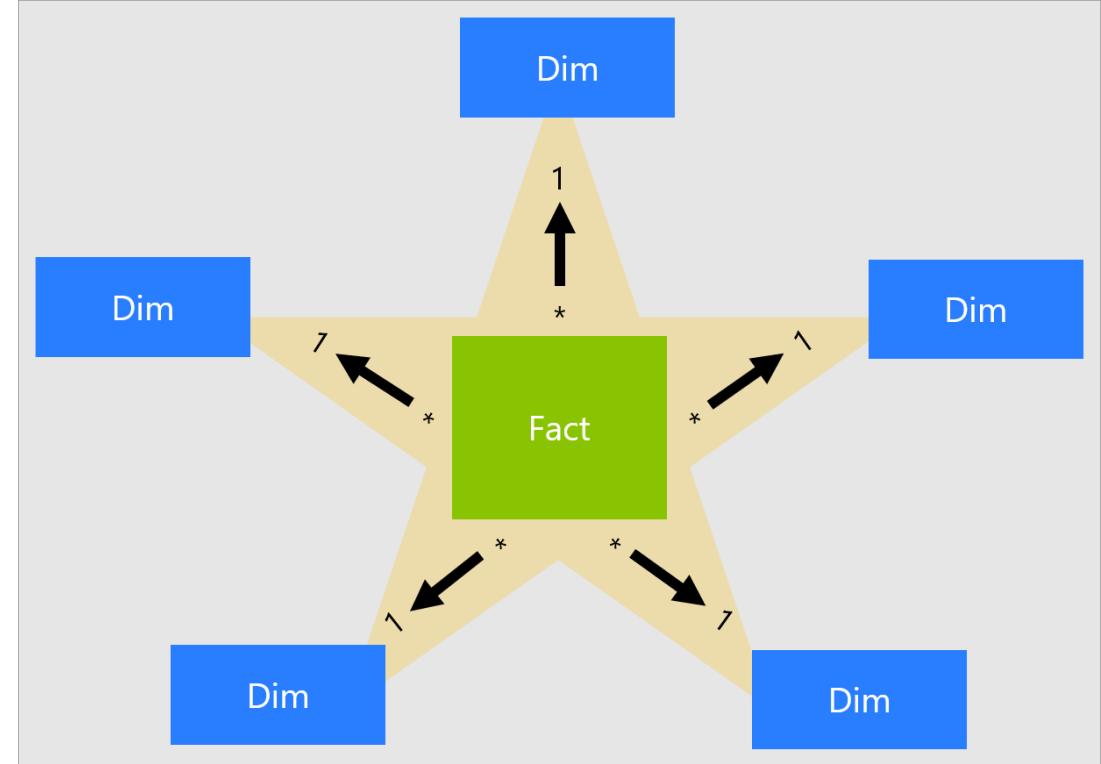
- When you source data from an export file or data extract, it's likely that it represents a denormalized set of data. In this case, use [Power Query](#) to transform and shape the source data into multiple normalized tables.

	SalesOrderNumber	OrderDate	ProductKey	ResellerKey	SalesAmount
1	SO69561	2020-05-31	594	546	226.00
2	SO69560	2020-05-30	513	100	218.45
3	SO69560	2020-05-30	594	100	113.00
4	SO69539	2020-05-28	243	529	858.90
5	SO69539	2020-05-28	378	529	1466.01
6	SO69541	2020-05-28	594	661	113.00
7	SO69542	2020-05-28	243	317	1717.80
8	SO69544	2020-05-28	243	666	3435.60
9	SO69545	2020-05-28	378	436	5864.04
10	SO69532	2020-05-27	594	312	113.00
11	SO69532	2020-05-27	513	312	436.90
12	SO69533	2020-05-27	594	476	226.00

	SalesOrderNumber	OrderDate	ProductKey	Product	Category	Color	Size	ResellerKey	SalesAmount
1	SO69561	2020-05-31	594	Mountain-500 Silver, 48	Bikes	Silver	48	546	226.00
2	SO69560	2020-05-30	513	ML Mountain Frame-W - Silver, 46	Components	Silver	46	100	218.45
3	SO69560	2020-05-30	594	Mountain-500 Silver, 48	Bikes	Silver	48	100	113.00
4	SO69539	2020-05-28	243	HL Road Frame - Red, 44	Components	Red	44	529	858.90
5	SO69539	2020-05-28	378	Road-250 Black, 52	Bikes	Black	52	529	1466.01
6	SO69541	2020-05-28	594	Mountain-500 Silver, 48	Bikes	Silver	48	661	113.00
7	SO69542	2020-05-28	243	HL Road Frame - Red, 44	Components	Red	44	317	1717.80
8	SO69544	2020-05-28	243	HL Road Frame - Red, 44	Components	Red	44	666	3435.60
9	SO69545	2020-05-28	378	Road-250 Black, 52	Bikes	Black	52	436	5864.04
10	SO69532	2020-05-27	594	Mountain-500 Silver, 48	Bikes	Silver	48	312	113.00
11	SO69532	2020-05-27	513	ML Mountain Frame-W - Silver, 46	Components	Silver	46	312	436.90
12	SO69533	2020-05-27	594	Mountain-500 Silver, 48	Bikes	Silver	48	476	226.00

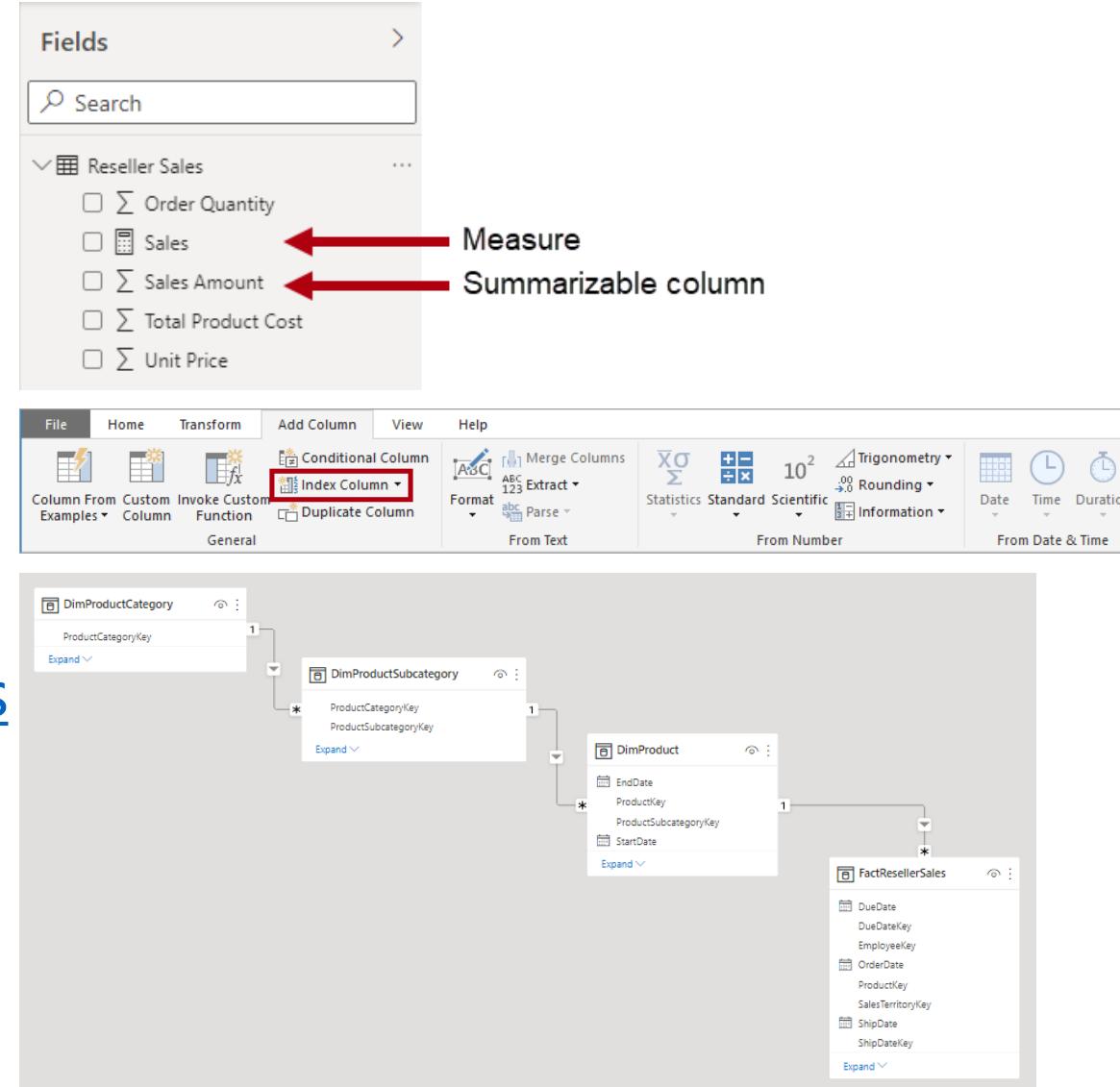
# Star schema relevance to Power BI models

- Star schema design and many related concepts introduced in this article are highly relevant to developing Power BI models that are optimized for performance and usability.
- Consider that each Power BI report visual generates a query that is sent to the **Power BI model** (which the Power BI service calls a **dataset**).
  - These queries are used to filter, group, and summarize model data. A well-designed model, then, is one that provides tables for filtering and grouping, and tables for summarizing. This design fits well with star schema principles:
    - Dimension tables support *filtering and grouping*
    - Fact tables support *summarization*
- There's no table property that modelers set to configure the table type as dimension or fact. It's in fact determined by the model relationships.
  - A model relationship establishes a filter propagation path between two tables, and it's the **Cardinality** property of the relationship that determines the table type.
  - A common relationship cardinality is *one-to-many* or its inverse *many-to-one*.
  - The "one" side is always a dimension-type table while the "many" side is always a fact-type table.
  - For more information about relationships, see [Model relationships in Power BI Desktop](#).
- A well-structured model design should include
  - tables that are either dimension-type tables or fact-type tables.
  - Avoid mixing the two types together for a single table.
  - We also recommend that you should strive to deliver the right number of tables with the right relationships in place.
  - It's also important that fact-type tables always load data at a consistent grain.
- Lastly, it's important to understand that optimal model design is part science and part art. Sometimes you can break with good guidance when it makes sense to do so.
- 



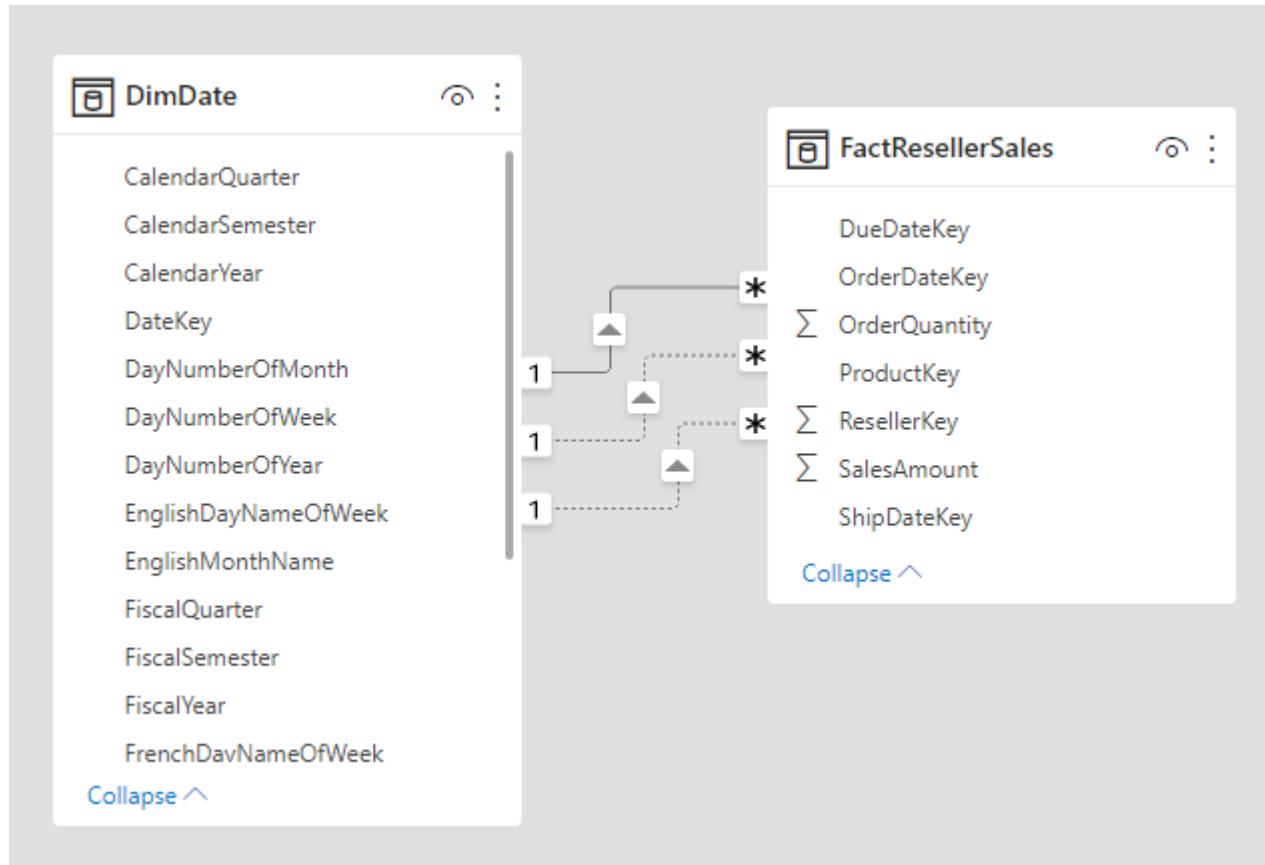
# Star schema relevance to Power BI model

- There are many additional concepts related to star schema design that can be applied to a Power BI model. These concepts include:
  - Measures
  - Surrogate keys
  - Snowflake dimensions
  - Role-playing dimensions
  - Slowly changing dimensions
  - Junk dimensions
  - Degenerate dimensions
  - Factless fact tables



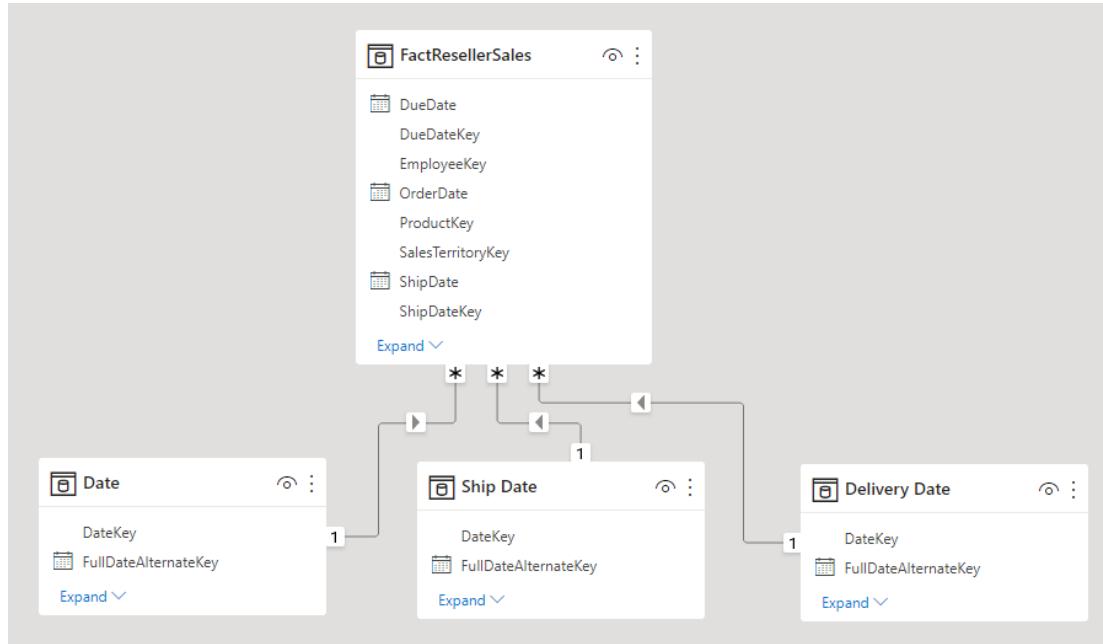
# Role-playing dimensions

- A **role-playing dimension** is a dimension that can filter related facts differently. For example, at Adventure Works, the date dimension table has three relationships to the reseller sales facts. The same dimension table can be used to filter the facts by order date, ship date, or delivery date.
- In a data warehouse, the accepted design approach is to define a single date dimension table. At query time, the "role" of the date dimension is established by which fact column you use to join the tables. For example, when you analyze sales by order date, the table join relates to the reseller sales order date column.
- In a Power BI model, this design can be imitated by creating multiple relationships between two tables. In the Adventure Works example, the date and reseller sales tables would have three relationships. While this design is possible, it's important to understand that there can only be one active relationship between two Power BI model tables. All remaining relationships must be set to inactive. Having a single active relationship means there is a default filter propagation from date to reseller sales. In this instance, the active relationship is set to the most common filter that is used by reports, which at Adventure Works is the order date relationship.
- The only way to use an inactive relationship is to define a DAX expression that uses the [USERELATIONSHIP function](#). In our example, the model developer must create measures to enable analysis of reseller sales by ship date and delivery date. This work can be tedious, especially when the reseller table defines many measures. It also creates **Fields** pane clutter, with an overabundance of measures. There are other limitations, too:
  - When report authors rely on summarizing columns, rather than defining measures, they can't achieve summarization for the inactive relationships without writing a report-level measure. Report-level measures can only be defined when authoring reports in Power BI Desktop.
  - With only one active relationship path between date and reseller sales, it's not possible to simultaneously filter reseller sales by different types of dates. For example, you can't produce a visual that plots order date sales by shipped sales.



# Role-playing dimensions

- To overcome these limitations, a common Power BI modeling technique is to create a dimension-type table for each role-playing instance. You typically create the additional dimension tables as [calculated tables](#), using DAX. Using calculated tables, the model can contain a **Date** table, a **Ship Date** table and a **Delivery Date** table, each with a single and active relationship to their respective reseller sales table columns.
- This design approach doesn't require you to define multiple measures for different date roles, and it allows simultaneous filtering by different date roles. A minor price to pay, however, with this design approach is that there will be duplication of the date dimension table resulting in an increased model storage size. As dimension-type tables typically store fewer rows relative to fact-type tables, it is rarely a concern.
- Observe the following good design practices when you create model dimension-type tables for each role:
  - Ensure that the column names are self-describing. While it's possible to have a **Year** column in all date tables (column names are unique within their table), it's not self-describing by default visual titles. Consider renaming columns in each dimension role table, so that the **Ship Date** table has a year column named **Ship Year**, etc.
  - When relevant, ensure that table descriptions provide feedback to report authors (through **Fields** pane tooltips) about how filter propagation is configured. This clarity is important when the model contains a generically named table, like **Date**, which is used to filter many fact-type tables. In the case that this table has, for example, an active relationship to the reseller sales order date column, consider providing a table description like "Filters reseller sales by order date".
- For more information, see [Active vs inactive relationship guidance](#).



# Junk dimensions

- A **junk dimension** is useful when there are many dimensions, especially consisting of few attributes (perhaps one), and when these attributes have few values. Good candidates include order status columns, or customer demographic columns (gender, age group, etc.).
- The design objective of a junk dimension is to consolidate many "small" dimensions into a single dimension to both reduce the model storage size and also reduce **Fields** pane clutter by surfacing fewer model tables.
- A junk dimension table is typically the Cartesian product of all dimension attribute members, with a surrogate key column. The surrogate key provides a unique reference to each row in the table. You can build the dimension in a data warehouse, or by using Power Query to create a query that performs full outer query joins, then adds a surrogate key (index column).

Order Status	Delivery Status	ResellerSalesJunkKey	A <sup>B</sup> C Order Status	A <sup>B</sup> C Delivery Status
Quote	Not Delivered	1	1 Quote	Not Delivered
Ordered	Not Delivered	2	2 Quote	Delivered
Cancelled	Not Delivered	3	3 Ordered	Not Delivered
	Delivered	4	4 Ordered	Delivered
	Not Delivered	5	5 Cancelled	Not Delivered
	Delivered	6	6 Cancelled	Delivered

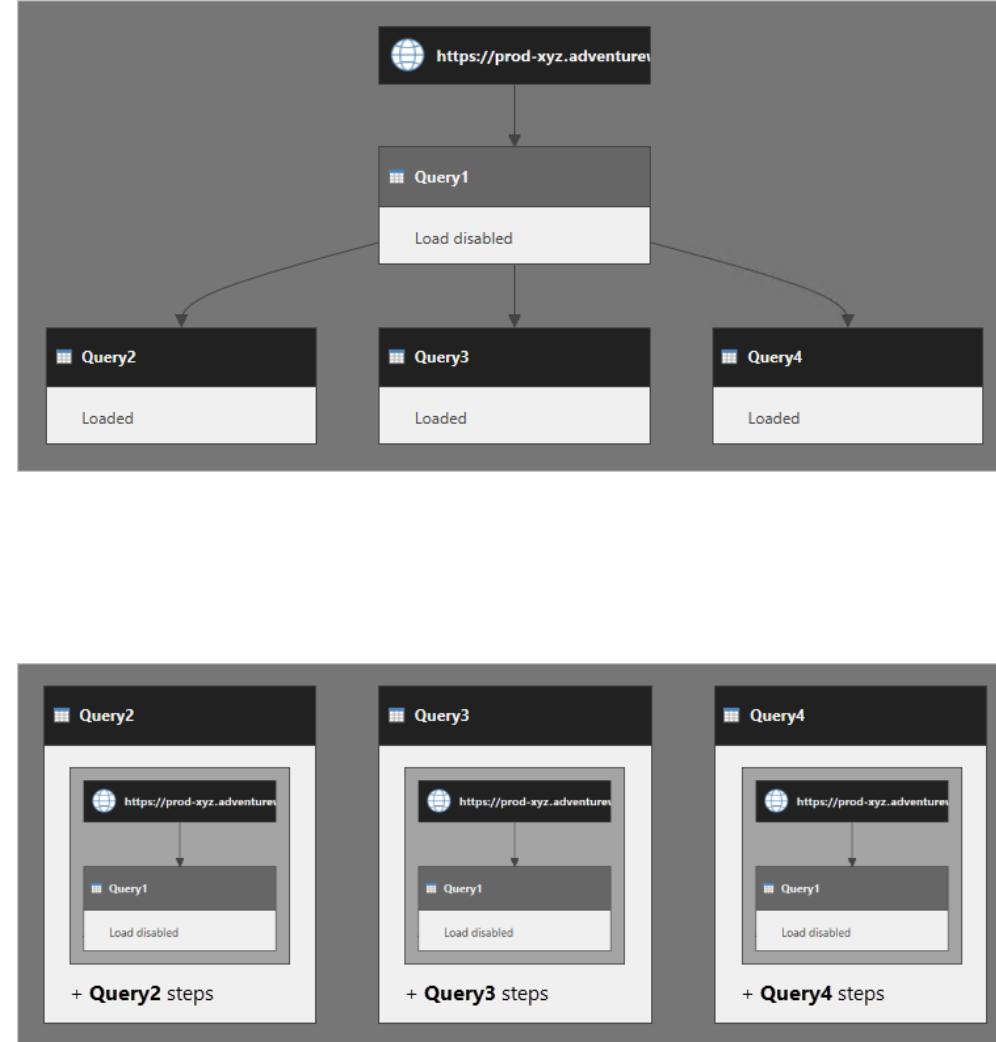
- You load this query to the model as a dimension-type table. You also need to merge this query with the fact query, so the index column is loaded to the model to support the creation of a "one-to-many" model relationship.

# Create date tables in Power BI Desktop

- To work with Data Analysis Expressions (DAX) [time intelligence functions](#), there's a prerequisite model requirement: You must have at least one *date table* in your model.
- A date table is a table that meets the following requirements:
  - It must have a column of data type **date** (or **date/time**)—known as the *date column*.
  - The date column must contain unique values.
  - The date column must not contain BLANKs.
  - The date column must not have any missing dates.
  - The date column must span full years. A year isn't necessarily a calendar year (January–December).
  - The date table must be [marked as a date table](#).
- You can use any of several techniques to add a date table to your model:
  - The Auto date/time option
  - Power Query to connect to a date dimension table
  - Power Query to generate a date table
  - DAX to generate a date table
  - DAX to clone an existing date table
- Tip: A date table is perhaps the most consistent feature you'll add to any of your models. What's more, within an organization a date table should be consistently defined. So, whatever technique you decide to use, we recommend you create a [Power BI Desktop template](#) that includes a fully configured date table. Share the template with all modelers in your organization. So, whenever someone develops a new model, they can begin with a consistently defined date table.

# Referencing Power Query queries

- Let's be clear about what this means: *When a query references a second query, it's as though the steps in the second query are combined with, and run before, the steps in the first query.*
- Consider several queries: **Query1** sources data from a web service, and its load is disabled. **Query2**, **Query3**, and **Query4** all reference **Query1**, and their outputs are loaded to the data model.
- When the data model is refreshed, it's often assumed that Power Query retrieves the **Query1** result, and that it's reused by referenced queries. This thinking is incorrect. In fact, Power Query executes **Query2**, **Query3**, and **Query4** separately.
- You can think that **Query2** has the **Query1** steps embedded into it. It's the case for **Query3** and **Query4**, too. The following diagram presents a clearer picture of how the queries are executed.
- Query1** is executed three times. The multiple executions can result in slow data refresh, and negatively impact on the data source.
- The use of the [Table.Buffer](#) function in **Query1** won't eliminate the additional data retrieval. This function buffers a table to memory. And, the buffered table can only be used within the same query execution. So, in the example, if **Query1** is buffered when **Query2** is executed, the buffered data couldn't be used when **Query3** and **Query4** are executed. They'll themselves buffer the data twice more. (This result could in fact compound the negative performance, because the table will be buffered by each referencing query.)
- Generally, we recommend you reference queries to avoid the duplication of logic across your queries. However, as described in this article, this design approach can contribute to slow data refreshes, and overburden data sources.
- We recommend you create a [dataflow](#) instead. Using a dataflow can improve data refresh time, and reduce impact on your data sources.
- You can design the dataflow to encapsulate the source data and transformations. As the dataflow is a persisted store of data in the Power BI service, its data retrieval is fast. So, even when referencing queries result in multiple requests for the dataflow, data refresh times can be improved.
- In the example, if **Query1** is redesigned as a dataflow entity, **Query2**, **Query3**, and **Query4** can use it as a data source. With this design, the entity sourced by **Query1** will be evaluated only once.



# Common Myths on BI



# 7 common myths about BI tools

## Myth 1: “This is too expensive for my business.”

- One of the most common myths about BI tools is that they’re only for huge enterprises with deep pockets.
- This simply isn’t true.
- There are BI tools available for businesses of all sizes, and many of them are very affordable.
- In fact, some BI tools are even free.
- BI tools can save businesses a lot of time and money. So, even if you’re on a tight budget, a BI tool may be an investment you can’t afford to pass up.

## Myth 2: “I don’t need a BI tool because I already have a reporting system.”

- Another common myth about BI tools is that they’re unnecessary if you already have a reporting system in place.
- But the truth is that BI tools can do much more than just generate reports.
- As we’ve seen, they can also provide insights through data visualizations and dashboards that businesses might not be able to get from their reporting system alone.
- This can help businesses save time and make better decisions.

## Myth 3: “I don’t need a BI tool because I have a data analyst.”

- Another common myth about BI tools is that they’re only needed if you don’t have a data analyst on staff.
- But the truth is that BI tools can be helpful even if you do have a data analyst.
- Data analysts can use BI tools to save time and make their jobs easier. And, as we’ve seen, BI tools can also provide insights that data analysts might miss on their own.
- So even if you have a data analyst on staff, it’s still worth considering whether a BI tool could be beneficial for your business.

# 7 common myths about BI tools

## Myth 4: “I don’t need a BI tool, I can just use Excel.”

- Another common myth about BI tools is that they’re not necessary if you’re already using Excel.
- While it’s true that Excel can be used for some basic data analysis, it’s not designed for complex tasks like data visualization or reporting.
- BI tools are much better suited for these tasks, and they can save you a lot of time.
- So even if you’re already using Excel, you don’t necessarily have to completely reject the idea of using a BI tool.
- In fact, you might find that using both Excel and a BI tool can be beneficial for your business.

## Myth 5: “I don’t need a BI tool because I have a CRM.”

- Another common myth about BI tools is that they’re not needed if you have a customer relationship management (CRM) system.
- But the truth is that BI tools can be very helpful for businesses that have CRMs.
- CRMs can be complex, and it can be difficult to get the information that you need from them.
- But BI tools can make it much easier to access and analyze your CRM data.
- CRMs are great for managing customer data, but they’re not always the best tool for analyzing that data.
- With BI tools, you can easily access your CRM data and generate reports that will help you make better business decisions.

## Myth 6: “BI tools are only for big companies.”

- This is another myth that simply isn’t true. As we’ve seen, BI tools can be beneficial for businesses of all sizes.
- They can help small businesses save time and money, and they can provide insights that businesses might not be able to get from their data alone.
- This myth is likely based on the fact that BI tools have traditionally been expensive and difficult to use. But as we’ve seen, there are now many BI tools that are affordable and easy to use.

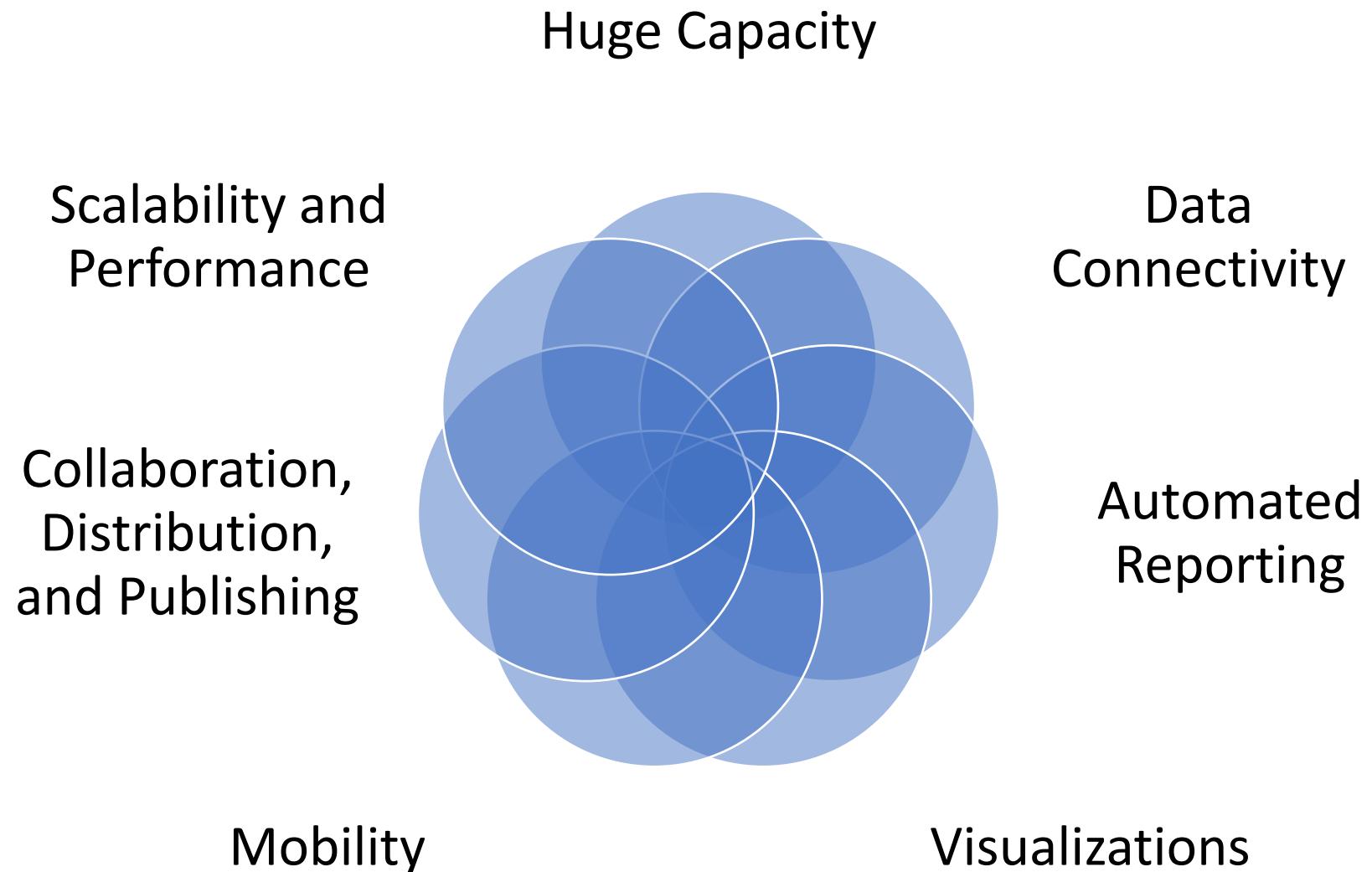
## Myth 7: “BI tools are a passing tech fad.”

- BI tools have been around for many years, and they’re only getting more popular.
- In fact, Gartner predicts that BI and analytics will be one of the most important trends in business in the coming years.

# Why BI is better than Excel?

- 1.Huge Capacity
- 2.Data Connectivity
- 3.Automated Reporting
- 4.Visualizations
- 5.Mobility
- 6.Collaboration, Distribution, and Publishing
- 7.Scalability and Performance
- 8.Security and Monitoring

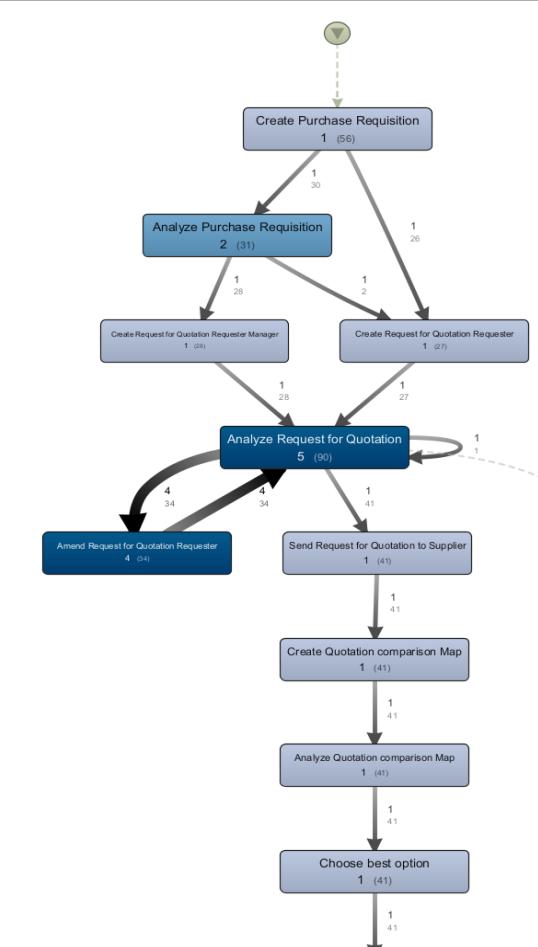
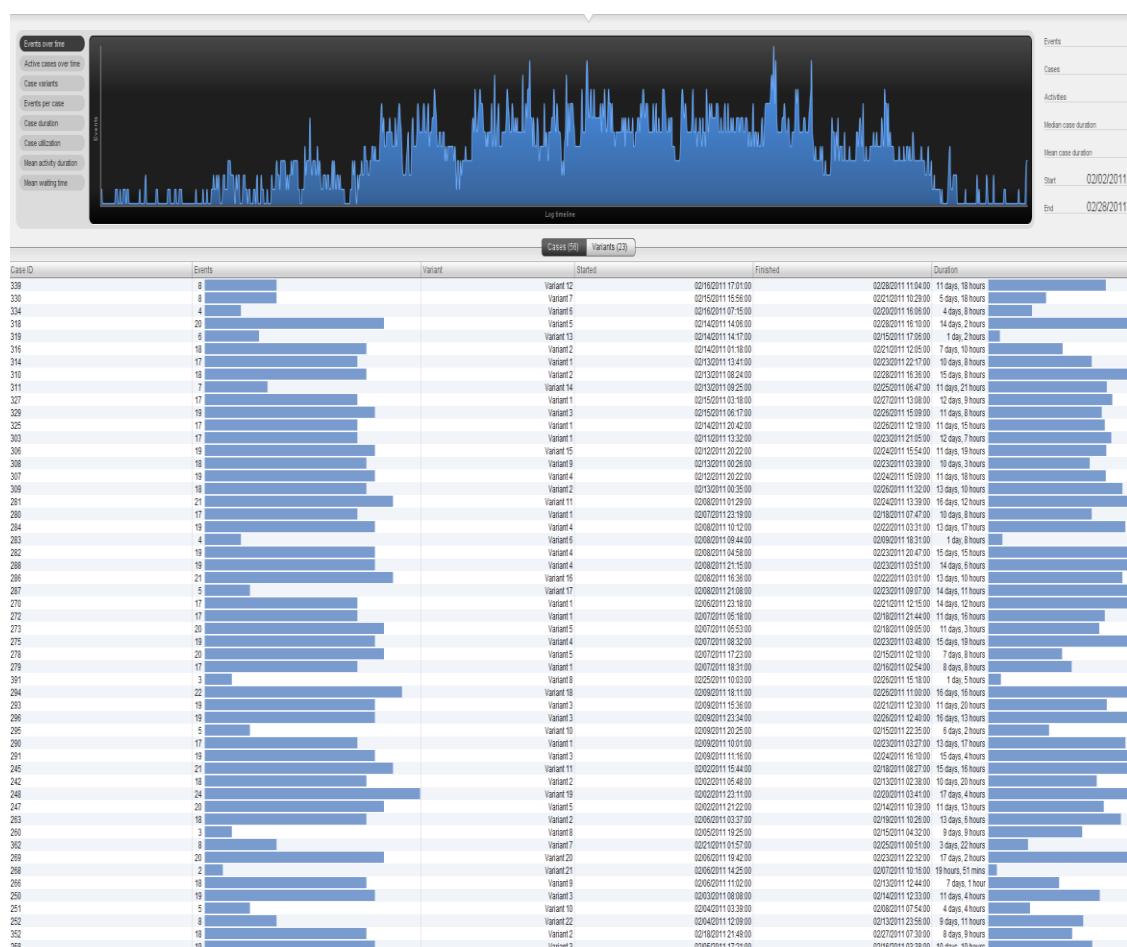
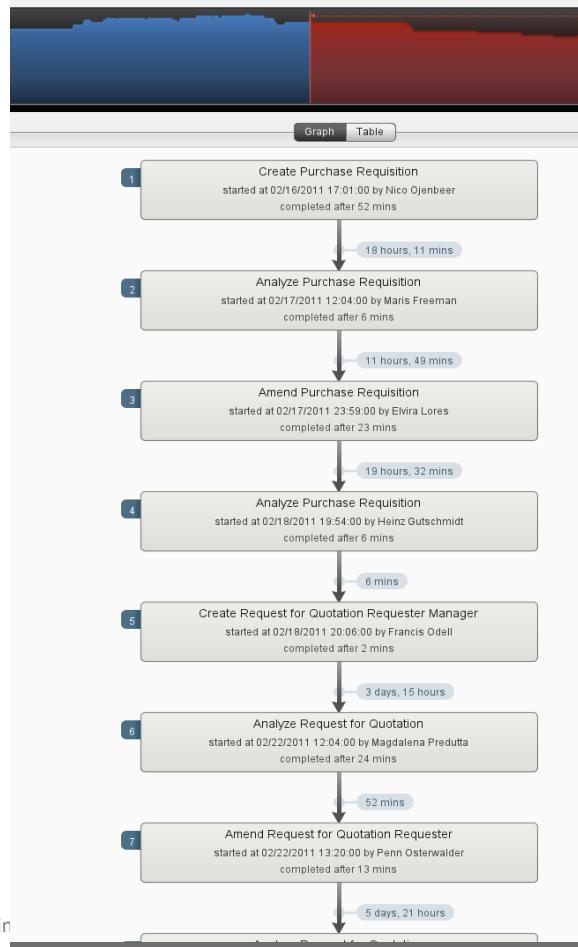
# Why BI is better than Excel?



# Process Mining

- Is BI the same as the Process Mining?

- No, two different cases. For process mining EventLog which is mainly output of an ERP/CRM system is the base data and other extra tools dedicated for P.M like Disco is needed for analyzing. However the idea is the same.



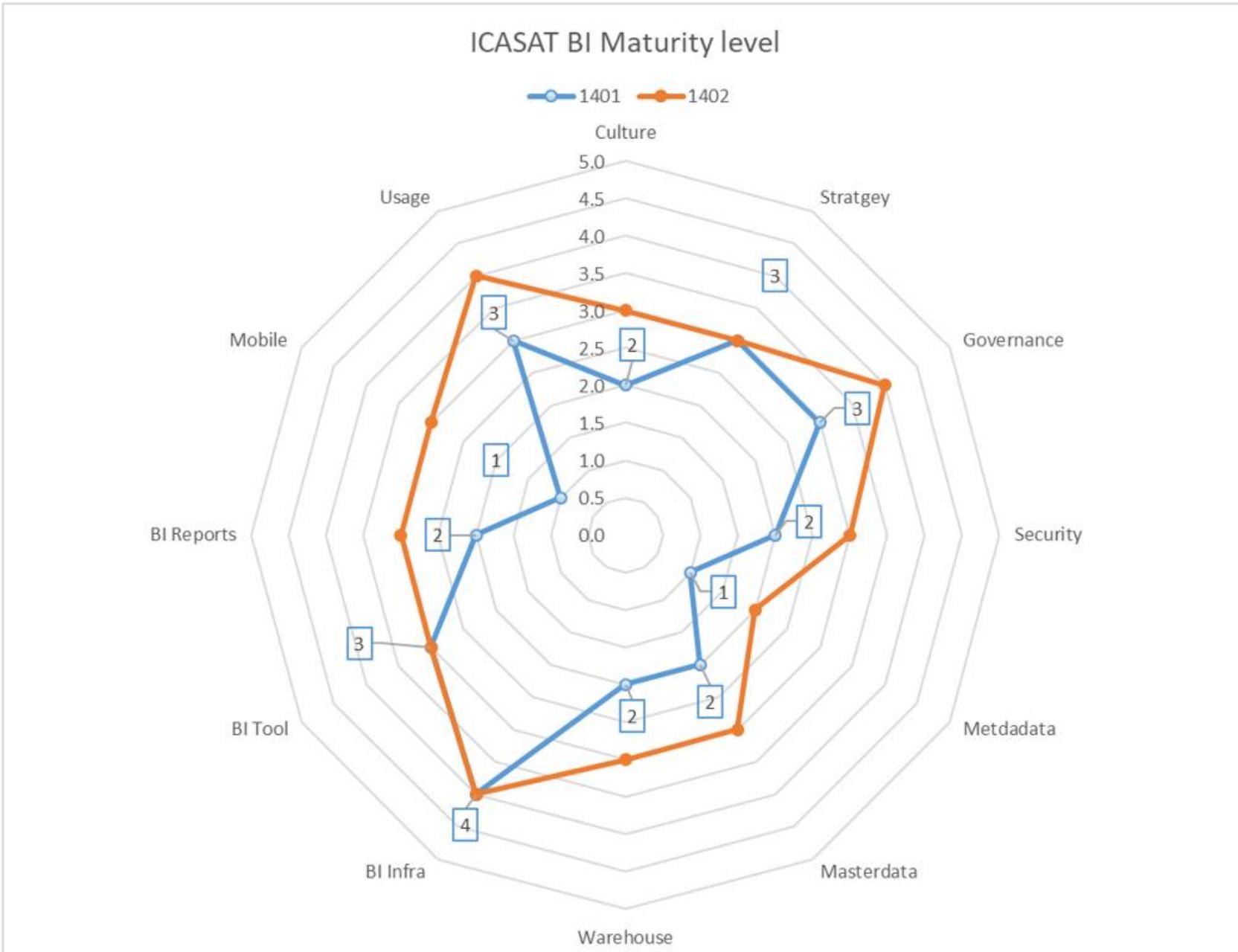
# Silo

- A data silo is a repository of data that isn't effectively shared across an organization and may not be properly managed.
- Although some entities know the data exists, other departments, business units or workgroups are unaware of its availability and unable to access and use it; the IT team may also not be aware of siloed data.
- From Excel spreadsheets and Access databases to larger data stores, organizations are often unpleasantly surprised to discover how many data silos they have.
- Silo Issues
  - **Data errors that don't get fixed.** A lack of oversight by IT may result in poor data quality that leads to faulty business decisions.
  - **Duplicate data that's inconsistent.** If similar data sets aren't in harmony, there isn't a single source of truth to rely on for sound decision-making.
  - **Lost opportunities for data sharing.** The organization can't take advantage of siloed data's potential value across the enterprise. Even when data sharing does occur, it's often inconsistent and disjointed.
- Master Data Management (MDM)

# BI Storage

Name	Explanation	Illustration
Data Warehouse	A large, structured repository of integrated data from various sources, used for complex querying and historical analysis	<p>Structured Data → Data Warehouse → Analysis, Report, Visualize</p>
Data Lake	A more focused, department-specific subset of a data warehouse providing quick data retrieval and analysis	<p>Raw Data → Data Lake → Analysis, Report, Visualize</p>
Data Mart	A vast pool of raw, unstructured data stored in its native format until it's needed for use	<p>Raw Data → Data Warehouse → Data Mart (Eng, Sales, Finance) → Analysis, Report, Visualize</p>
Delta Lake	An open-source storage layer that brings reliability and ACID transactions to data lakes, unifying batch and streaming data processing	<p>Raw Data → Delta Lake (ACID, Meta data, Unified Handling) → Analysis, Report, Visualize Existing Data Lake Solution</p>
Data Pipeline	A process that moves and transforms data from one system to another, often used to populate data warehouses and data lakes	<p>Data Pipeline → Analysis, Report, Visualize</p>
Data Mesh	An architectural and organizational approach where data ownership and delivery are decentralized across domain-specific, cross-functional teams	<p>Data Governance (Finance, Sales, Engineer, Operation) → Data Infra (Finance, Sales, Engineer, Operation)</p>

# Your Current Company BI rating → where to be in 2Year?



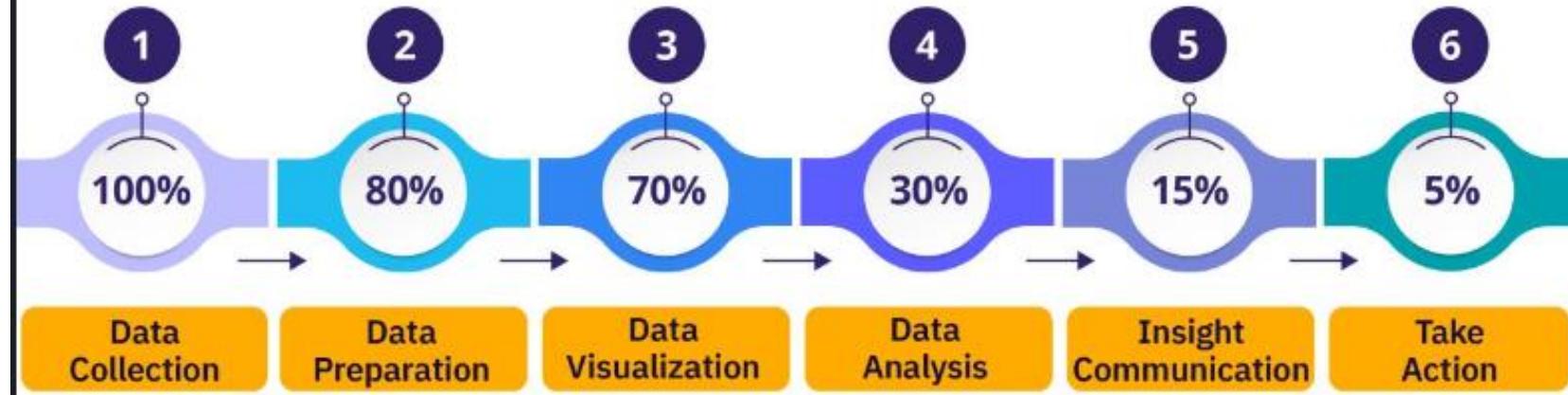
# Review

- Data Quality
  - "Data quality is a core data management discipline that employs processes and capabilities to ensure fitness of data for its intended use,"
  - Clean, consistent and accurate
    - Tolerance for errors? (organization dependent)
    - in an IoT situation, consider whether actual valves might blow or portions of the grid might drop
- foundational set of data quality dimensions
  - accuracy, completeness, consistency, conformity, integrity and timeliness
  - Organizations must evaluate their industry and data needs to adequately determine the requirements for the six dimensions of data quality and the best application for each unique use case
- "Data users will always be the best judges of data accuracy,"
- **Measure data quality**
  - **Accuracy.** Does the data correctly describe the real-world object or event to which it pertains?
  - **Completeness.** Does the data contain all of the attributes needed to provide a full and accurate description of the object or event?
- **Consistency.** Is a particular data element the same across different systems and data stores in an organization?
- **Timeliness.** Is the data up to date and available for use when it's needed?
- **Conformity.** Does the data conform to the organization's documented set of business definitions and specifications, including standards on data type, size and format?
- **Integrity.** Can a data element's relationship with others it is connected to across the enterprise be traced to ensure that all of the information is reliable?
- **Uniqueness.** Does a record pertaining to an object or event appear only once in a data set, or are there duplicate entries?

Where do

# Data Analytics

## Marathon



100% of organizations are here



The value is realized here



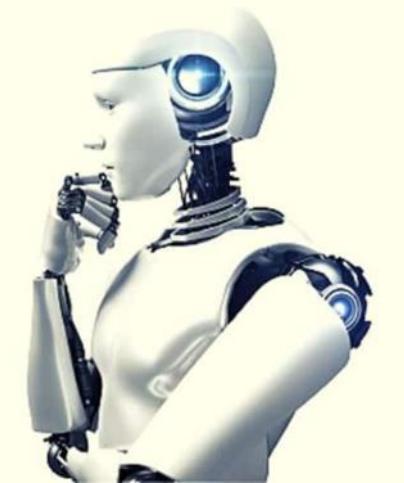
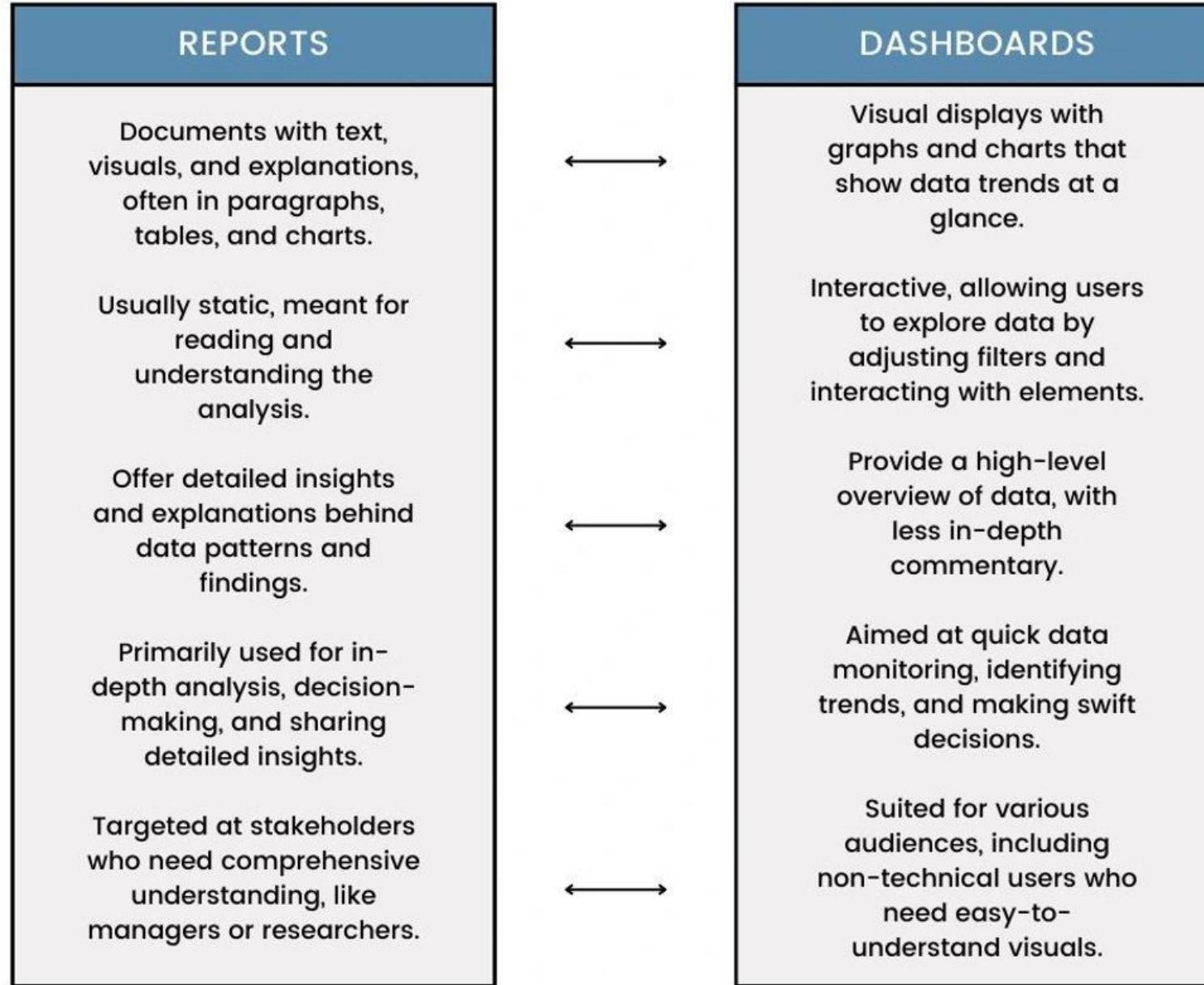
Only 5% are here



# Some Questions (FAQ) You may Have

- Can I do BI with only excel?
  - Yes, with lower features and not flexible and scalable as PBI,
  - more develop time and more cost..
  - not public visuals, not sharing features, not governance, ..
- Can I use Persian Language in MS (Microsoft) BI
  - Yes, Although still visuals cannot be right-to-left, not important!
- Can I use Persian calendar in MS BI
  - Directly No!, indirectly Yes,
  - We have sanction or Microsoft limitations possible due to sanctions, will be solved later
  - Time Intelligence functions need tricks and workaround
- Can We use other tools like Qlik, Tableau, Oracle instead of MS BI?
  - Yes, depends on your solution provider and it's cost
- Can I use MS BI personally in company?
  - Yes. If your IT policy allows.
- Does BI kill creativity?
  - Mainly No, Maybe Yes!
- Can BI data be wrong and misguiding?
  - Yes, Ask your Operator, (GIGO)
- Am I dependent to BI developer forever?
  - The same like Aryan, Hamkar, MS Office & CRM tools and your IT team,
- How long it takes I design and implement MS BI?
  - Depends on your current DATA readiness, no. of reports needed and scope of work and KPI complexities and your budget
- Is it possible my BI project fails?
  - Yes! But No!, It depends to you, With leader commitment and managers admittance and using proper DA and BI developers: No! Depends on your self..
- Can I postpone BI Project after more public acceptance..?
  - Yes, but you may lose opportunities and lag the competitions.. The sooner the better
- How much is the BI develop costs per year or per Project?
  - It depends on your work complexity and No. Of reports you want to implement and No. of KPIs you need and ... For ICASAT, for the BI developer part we forecasted \$300/M for around 2Y which is less than 1.2% of Total Cost/Y. I used my experience for BA and DA and DG, freely!
- How much around is the Costs for BI infrastructure?
  - We already had major parts, just we needed to add a enough powerful BI server (VM) and Network Security
- What other costs we incur for BI implementation?
  - BI server and SQL server and access and security and .. administration costs (usual IT costs)
  - For migrating data into database you need a SQL developer (extra \$200/M) for possibly around 6 Months
- How much is hard to learn MS-BI compared to excel?
  - For simple reports it is easy, for advanced reports a BI developer is needed for DAX programming.
  - For enterprise deploy an IT/IS/SQL expert is needed.
  - Collaboration of all managers is needed for data governance.
  - Excel also is not easy to master for advanced features
- What is diff between dashboard and Report?

# Dashboard Vs. report



# Some Questions You may Have

- What is the future of PBI?
  - It is a Microsoft product! It is already a winner. Guess the rest.
- What features do I lose with MS-BI private server compared to Microsoft Cloud Service?
  - Workspaces, Apps,
  - CAPEX -> OPEX Model,
  - Dashboards
  - Some AI features, Some access and Security features (RLS, access)
  - Possibly MS Azure and Power Automate
  - MS Cloud costs vs. Internal costs
  - Native cloud vs. public cloud
- How BI server is updated?
  - By now from MS web site
  - No downward compatibility, upward compatibility is okay
  - If Microsoft Stop it, our BI will be stopped
  - If Microsoft change Activation policy, we are again stopped until cracked
- Is it possible that some data of reports be wrong?
  - For measures yes, it is normal in DAX or any develop case, but can be debugged
- Can we hand-over implemented BI reports to another developer if required?
  - Sure... not too hard
- How BI data is refreshed?
  - With proper design and a scheduled refresh policy requested by user or data-refresh rate
- Can I use Enterprise BI from outside and on public IP address rather private ones?
  - Yes, needs some more IT/security efforts
- Can I use my mobile phone for BI access?
  - Yes, there is an app for this (Android, iOS)
  - it needs first designing reports for mobile layout
  - Usually only KPI cards is applicable
- How many of peoples have been involved in ICASAT BI develop?
  - Me as CDO (BA & DA) plus one-two BI developers for designing and developing
  - One IT expert for IT infra (CPU and storage and access) & servers installations and configurations and troubleshooting and administration
  - ICASAT mid-managers for data preparation
- Can we have BI without ERP or CRM?
  - Yes!, Yet you have data & you can use excel
  - CRM is transactional system, BI is Analytical system, they complement each other, they do not confront
- Can we have BI (DM) without a BI tool?
  - Yes, even with paper form or excel but not very effective
  - But you need data management as your underlying base always
- Can I use MS-BI as a simple ERP/CRM?
  - Generally No!, But to some level Maybe.
  - depends on your requirement, the exact answer depends on your exact requirement

# Some Questions You may Have

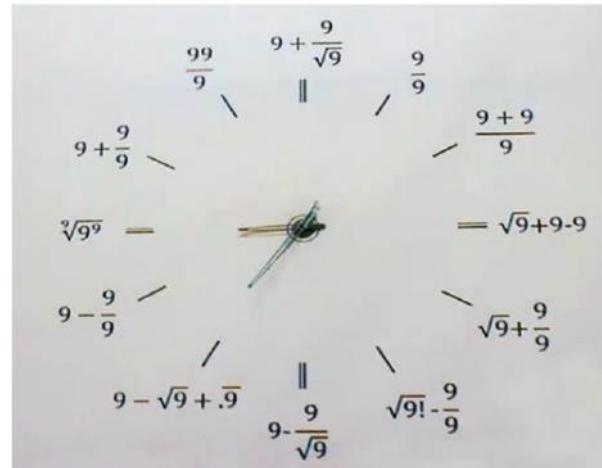
- Can I give access to the BI reports to outside users like customers or regulators or partners?
  - Yes. That is part of BI benefit.
  - You should just consider your DM/BI policies and limitations
- Can we define team performance and staff performance KPIs with BI?
  - Yes, with great visibility and full parameterized
  - It is a mix of performance process design and BI develop and BI usage
  - It can even be monetized in BI automatically so that team or staff can see it online
  - It can show defects and weakness points..
  - you should start with pain points and define your desired KPIs and see how you can quantize and digitize it and then trace trends
- Can the staffs fool the BI data? (change, fraud, ...)
  - It depends on how you create and collect data
  - In SQL No.; In Excel yes, they can manipulate it; there are some tricks that even in excel we can ban this, needs more effort and develop time
  - Our next phase of data warehouse is SQL-based
  - If they want they can.. But the data cheat is shown more easily and outliers are visible
- How BI server updates (refreshes) its data from Data source?
  - Data source are kept in DWH (data warehouse)
  - We define a refresh policy (every day or every week or every hour or ...) for each report independently and apply that policy to the report
- Can I define access rules for BI report such as only this guy see this report and cannot see other reports?
  - Yes, DG is part of BI structure and MS BI implement it.. The security level is even higher than this.. Needs more sophisticated and a senior BI developer is needed
- Can I build an enterprise level BI report on top of functional (departmental) BI reports?
  - Yes, although it takes time and it needs more advanced modeling and needs a strict DG (like Master Data, Reference Data,...)
- What are the limitations of BI?
  - BI is not CRM. BI is not SQL.
  - BI is just an analysis tool
- What is the replacement for BI?
  - Just BI! You can change your tool and DWH or platform, but at the end of the day they are all BI!
  - BI is BI, just like CRM is CRM, and excel is excel.
- These are some questions I thought you may have; You can also write your own questions and email me [amorshed@yahoo.com](mailto:amorshed@yahoo.com) to be brought up in the next meeting

# Feedback and Voting time

- How much do you think you need to deploy DM/BI in your department or organization?
    - 1- A must
    - 2- An advantage
    - 3- Yet Not sure
    - 4- Useless
    - 5-First CRM then BI
    - 6-CRM has BI in it, no need to extra BI
    - 7- No Idea
  - What are your major expectations from DM and BI in your department?
    - 1- Reporting
    - 2- Performance
    - 3- Visibility & Transparency
    - 4- Time saving
    - 5- Customer demand or happiness
  - 6- Centralized shared silo-less data
  - 7- Decision Making
  - 8- Finding Weak points & Process Improvement
  - 9- Increase Staff Replaceability (Substitutability)
  - 10- Team Management
  - 11- Project Management
  - 12- Regulator Requirement
  - 13- Competitor advantage
  - 14: Clear Accountability
- 
- Your Answers specifies:
    - How much your company is ready for BI
    - How much your company is willing to adopt BI
    - How much your company will gain from BI

# BI Budget





# Thank You for taking your time!

## Any Questions? :

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