October 2022

# Data & AI Transformation <sup>+</sup> Data Strategy Assessment Offering



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**01** How is data and AI changing business?

02 How do we approach data strategy?

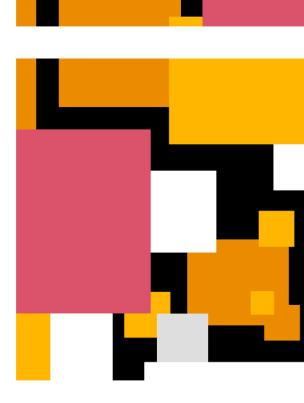
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# How is data and AI changing business?





# We see four converging trends that challenge businesses to transform data and AI into a powerful strategic tool



## Global **Big Data** volumes in Zettabytes

Data volumes to rise to 180 zettabytes by 2025, necessitating the use of Big data technologies for organization to manage the data, such that it can deliver fast insights and actions for business.



# 3

# Growing market of **Data Monetization**

The market for data monetization is expected to growth at an annual rate of 19.6% from 2021 to 2030, reaching over \$12 billion.



#### Sources: Statista, Forbes, Frost & Sullivan, Polaris Market Research Data & Al Transformation



# Data and AI **promote** Economic **Growth**

Artificial Intelligence, enabled by data, could boost output by 26% for local economies by 2030.



# **Analytics and AI Ecosystems** are transforming

Analytics vendors (BI, Appliance, Databases, Big data, Analytics) positioning themselves differently and aligning themselves with Analytics agenda of customer.

# Data & AI touches every part of the value chain, with the potential to significantly drive growth and efficiency

Strategy & Business Model	R&D & Innovation	Purchasing & Production	Supply Chain & Logistics	Marketing, Sales, Customer Service	Enabling Functions
<ul> <li>How can we grow our market share and which markets to enter, exit or expand?</li> <li>What new products and services and our competitors announcing?</li> <li>What are possibly interesting M&amp;A targets?</li> </ul>	<ul> <li>How do we innovate and introduce new products and services?</li> <li>What does the customer actually want in our products?</li> <li>How are our products performing in the field and what can we learn from their usage patterns?</li> </ul>	<ul> <li>How can we increase efficiency and effectiveness of our operations?</li> <li>When do we need to maintain which production asset to avoid unplanned downtimes?</li> <li>How can we mitigate product quality risks due to failures in production?</li> </ul>	<ul> <li>How will we ensure our product supply is meeting demand?</li> <li>Where are our goods currently located and when will they arrive?</li> <li>Which routes are optimal taking into account weather, traffic, demand?</li> </ul>	<ul> <li>How can we engage with our customers to enhance their experience?</li> <li>How can we reach more customers and price our products to increase sales?</li> <li>How do we increase customer satisfaction and retain more customers?</li> </ul>	<ul> <li>How can we get a better return on our talent, capital, and assets?</li> <li>How can we automated internal processes using RPA?</li> <li>How can we reduce IT operations cost by predicting peaks?</li> <li>How can we reduce our environmental footprint?</li> </ul>

# Enterprises recognize the essential role of data for their business, but struggle to effectively manage and monetize it



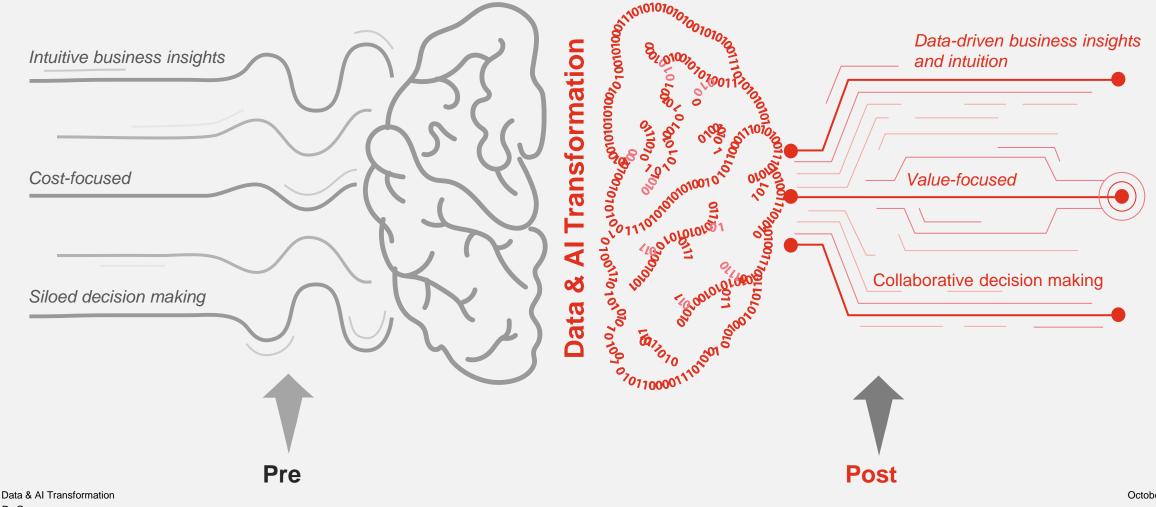
### Why is data becoming essential for businesses?



What are common challenges around data?

Increased <u>customer</u> expectations	Faster <u>technology</u> development	Missing <u>data excellence</u>	Shortage of skills and capacities
<ul> <li>Customers (B2C) ask for new &amp; personalized products and services, as well as faster delivery</li> <li>Businesses (B2B) demand higher flexibility, transparency and speed of operations</li> </ul>	<ul> <li>Emerging usage of smart connected devices, sensors and online channels creates <b>Big Data</b></li> <li>Advanced data &amp; analytics capabilities enable <b>disruptive Al</b> applications in every industry</li> </ul>	<ul> <li>Missing transparency of and access to data in silos</li> <li>Low data quality hinders success of analytical use cases</li> <li>Unclear architecture and governance for data assets</li> </ul>	<ul> <li>Sparse and distributed experts with no critical mass to drive change</li> <li>War for talent in the market</li> <li>Missing experience with operationalization of data analytics</li> <li>Low collaboration across teams</li> </ul>
New <u>competitor</u> market entries	Stricter regulatory framework	Diverse <u>IT systems</u> landscape	Uncertain <u>return</u> on investments
<ul> <li>Start-ups use data to create a better user experience and increase speed, thus gaining market share</li> <li>Technology companies don't just partner but also compete with traditional businesses</li> </ul>	<ul> <li>Data protection standards establish themselves globally</li> <li>Public concerns about data security threats rise</li> <li>Political attention on Al ethics and governance increases</li> </ul>	<ul> <li>Limited scalability and connectivity of legacy systems</li> <li>Tedious cloud transformation</li> <li>Uncertainties about open source</li> <li>Confusing market landscape for Big Data and AI technologies</li> </ul>	<ul> <li>Value of data assets is unclear</li> <li>Many data use cases don't reach production, thus do not add value</li> <li>Data does not get enough attention for significant investments</li> </ul>

# Leaders and organizations need to reimagine their capabilities and change their mindset to succeed with data & AI



# 02 How do we approach data strategy?

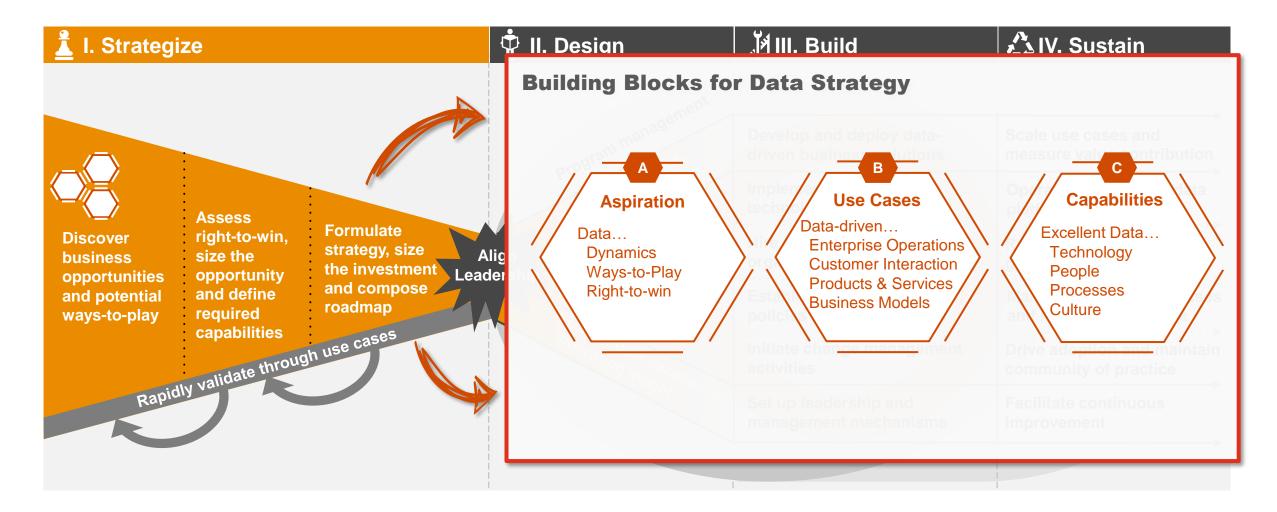


October 2022 8

# We support our clients from data strategy through designing, building and sustaining data excellence capabilities

1. Strategize	🛱 II. Design	ِرْא III. Build	🔥 IV. Sustain
	ment		
	Program management	Develop and deploy data- driven business solutions	Scale use cases and measure value contribution
Assess	Conduct proof cases	Implement fit-for-purpose technology stack	Operate and enhance data platform tech. stack
Discover right-to-win, Formulate business size the the investment	Align Design and plan data	Hire talent and establish organizational structure	Retain and grow top talent, gradually decentralize
and potential and define and compose and compos	excellence capabilities	Establish process guidance, policies and KPI's	Manage operating expenses and report performance
Rapidly validate through use cases	operating model lence	Initiate change management activities	Drive adoption and maintain community of practice
Rapidly Value	odel rence	Set up leadership and management mechanisms	Facilitate continuous improvement

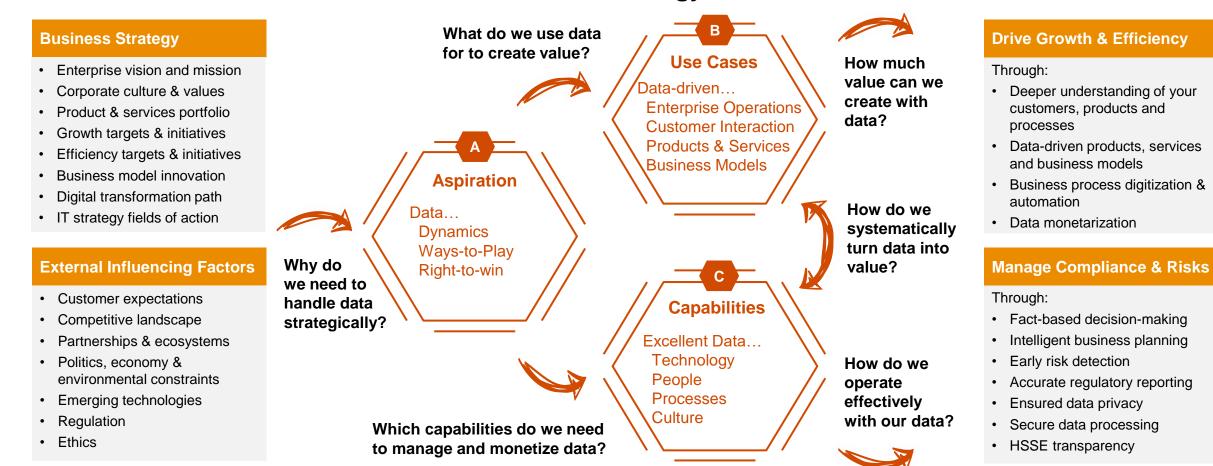
# When designing a data strategy, we think mainly along three building blocks: Aspiration, Use Cases & Capabilities



# Data strategy sets the aspiration and derives critical use cases and capabilities for the enterprise to deliver value with data

**Data Strategy** 

## **Motivation**



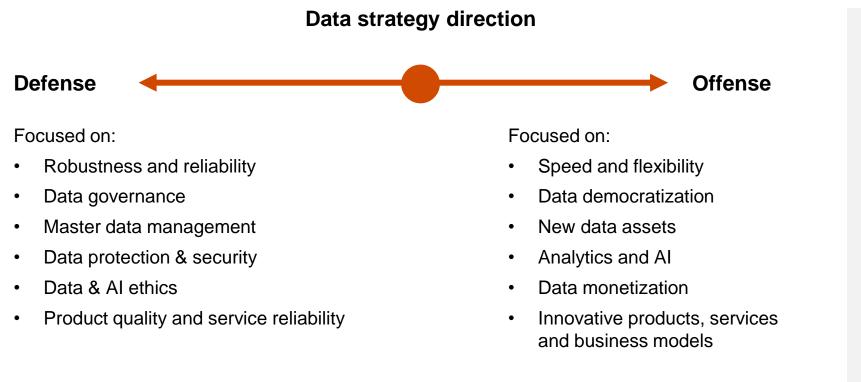
Value

A Aspiration

### **B** Use Cases

## C Capabilities

# Finding the individual sweet spot on the offense-defense spectrum is an essential aspect to defining the way-to-play



The right positioning on the offense-defense spectrum balance depends on many factors, e.g.:

- Business strategy
- Ambition of value creation with data
- Sensitivity of processed data
- Regulatory framework
- Digital innovation funnel
- Proximity to consumer (B2B, B2C)
- Competitive situation
- Maturity of data management and analytics capabilities
- Corporate culture



The strategic direction may also evolve over time, e.g. starting with a focus on defense and then shifting more towards the offense

## A Aspiration

## **B** Use Cases

## C Capabilities

# Use cases need to be collected and prioritized systematically across the entire value chain and product & service portfolio

### Use case collection

 Collect use case along the entire value chain and across all business units



 Collect use case from the product & services portfolio and market research



Internal use cases

Commercial use cases

0 💭 -0 Digitally augmented equipment	0 <b>☆</b> 0 Customer service solutions	Fight Integrated warehouse solution
Truck connectivity	Remote diagnosis	Open intralogistics platform
Oriver safety	Predictive maintenance	Integrate trucks & WMS
Nisuse diagnosis	Battery management	C Monetze data
-	-	-

#### Use case evaluation

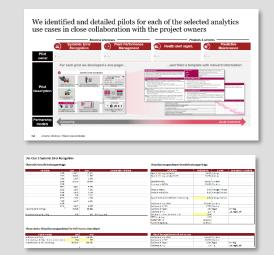
 Gather high-level use case requirements and qualitatively evaluate their expected value and ease of implementation to shortlist use cases with good potential and feasibility

	<ul> <li>Manufacturing E Sales</li> <li>Warehousing</li> </ul>	Service	Analysis
Contract sectors and the first of the first sectors of the first sectors of the first of the first sectors of the	Ligal Handray advantar     Prace     Constant 2016     Constant 2016     Constant 2016     Constant 2016     Constant 2016     Constant 2016     Constant 2016	Charagenese datibuads a bactaco top	A The second monotonic and advanced in the first the first the second monotonic advanced monotoniconic advanced monotonic advanced monotonic advanced monotonic



#### Use case prioritization

- For shortlisted use cases, compose a quantitative business case based on estimated implementation cost and benefits, i.e. additional revenues, cost savings etc.
- Decide about funding of top use cases through elevator pitches in a top management investment board



#### Illustrative examples

Data & AI Transformation PwC A Aspiration

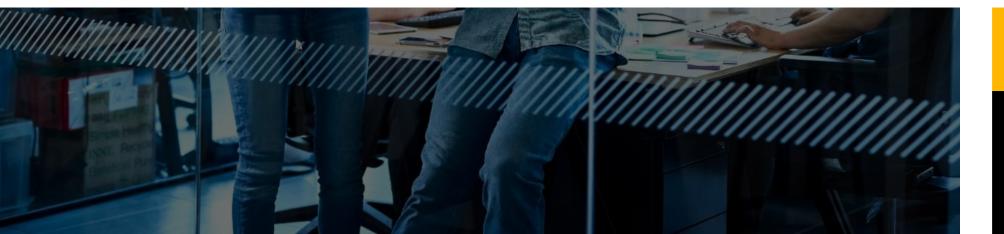
### **B** Use Cases

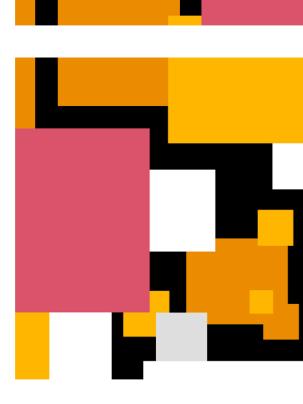


To enable effective data usage, enterprises need to optimize their data capabilities along the dimensions technology, people, process & culture

	Technology	People	Processes	Culture
Data Excellence Capabilities	<ul><li>Which functionalities?</li><li>Which systems &amp; tools?</li><li>Which IT infrastructure?</li></ul>	<ul><li>Which roles &amp; capacities?</li><li>Which org. structure?</li><li>ecosystem &amp; partnering</li></ul>	<ul><li>Which activities?</li><li>Which rules &amp; policies?</li><li>Which KPIs?</li></ul>	<ul><li>Which values?</li><li>What collaboration?</li><li>What communication?</li></ul>
Contraction Data Architecture	•	•	•	P
مے Data Quality	•	•	•	•
Data Governance	•	•	•	•
Data Processing	•	•	•	•
Data Analytics	•	•	•	•
Data Protection				

# What do we offer?

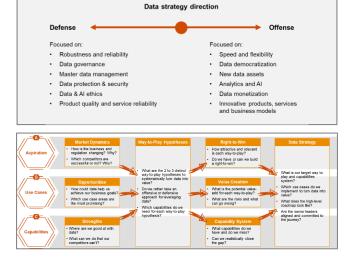




# We leverage our proven data strategy assessment toolkit to quickly scan your aspiration, use cases and capabilities

# Aspiration Validation

Through a joint data visioning workshop, we assess your current data strategy and challenge your rightto-win, potentially resulting in a sharpened way-toplay.



### **Use Case Assessment**

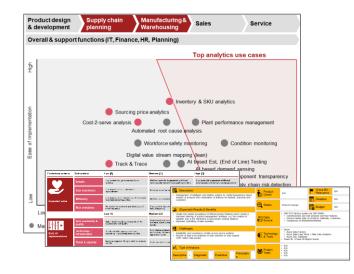
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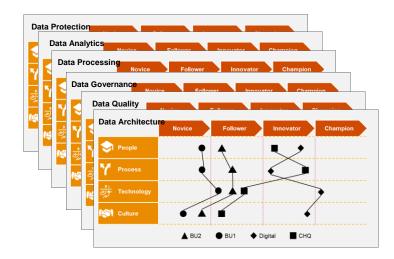
Using our use case catalog and templates, we jointly collect, enhance and prioritize your data use cases by potential value and implementation feasibility.

## С

#### **Capability Evaluation**

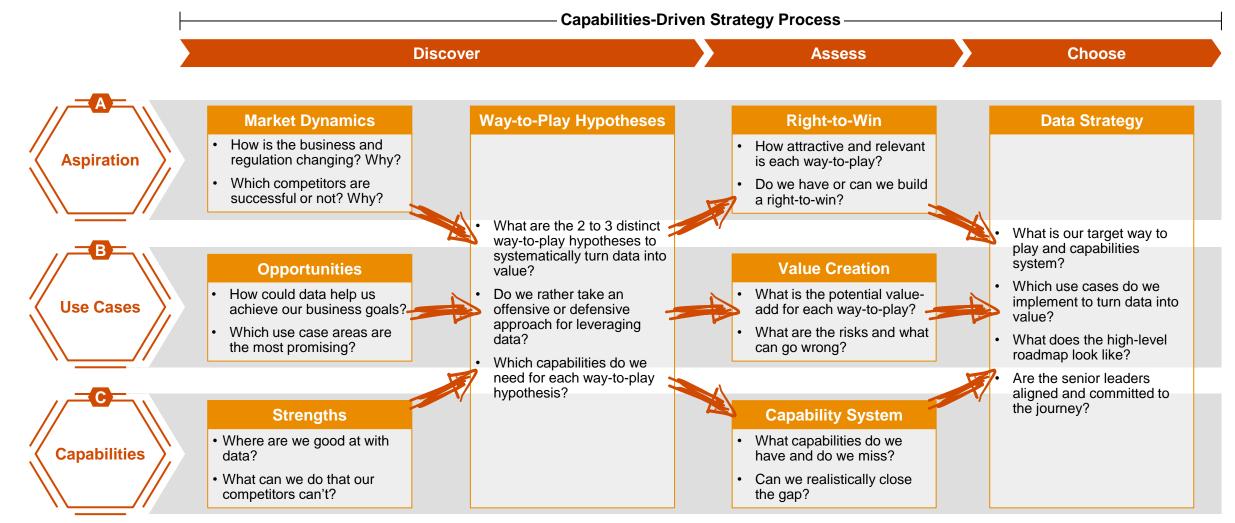
Using our capability questionnaire, we assess the current state of your capabilities and technology along the six dimensions of our data excellence framework.







# In the aspiration assessment, we challenge your strategy by testing new hypotheses and analyzing your right-to-win



# In the use case assessment, we evaluate your data-to-value creation and identify required key capabilities

Evaluation criteria	Sub-criteria	Low [0]	Medium [1]	High [3]
	Growth	Low potential to generate additional revenue	Medium potential to generate additional revenue and medium fit to existing portfolio	High potential to generate additional revenue and complement existing portfolio
Expected value	User experience	Low impact on user experience improvement	Positive impact on user experience	High impact on user experience, adds deep customer understanding
	Efficiency	Low improvement of process efficiency and no potential cost reduction	Medium improvement of process efficiency	Significant improvement of process efficiency and cost reduction potential
	Risk avoidance	No safety improvement and decrease of error frequency	Slight safety improvement and decrease of error frequency	Significant safety improvement and decrease of error frequency
		Low [1]	Medium [2]	High [3]
Ease of implementation	Data availability & quality	High uncertainty about data availability, accessibility and quality	Data distributed over multiple source systems, some uncertainty about data quality	Data available in one major source system, high confidence about the data and its quality
	Technology / Infrastructure	Distributed data management and computing, highly integrated solution	Non-relational database or stream processing, advanced analytics tool, custom application code	Relational database, data visualization
	Talent & capacity	Big data engineer, AI specialist, duration in months	Data scientist, duration in weeks	Business analyst, duration in days

# In the capability evaluation, we review the fit of your current data technology, people, processes and culture

	Technology	People	Processes	Culture
Data Excellence Capabilities	<ul><li>Which functionalities?</li><li>Which systems &amp; tools?</li><li>Which IT infrastructure?</li></ul>	<ul><li>Which roles &amp; capacities?</li><li>Which org. structure?</li><li>ecosystem &amp; partnering</li></ul>	<ul><li>Which activities?</li><li>Which rules &amp; policies?</li><li>Which KPIs?</li></ul>	<ul><li>Which values?</li><li>What collaboration?</li><li>What communication?</li></ul>
C Data Architecture	•	•	•	•
Data Quality	•	•	•	•
Data Governance	•	•	•	•
Data Processing	•	•	•	•
Data Analytics	•	•	•	•
<b>Data Protection</b>	•			•
Data & AI Transformation PwC	Deep Dive on the following page			Octob



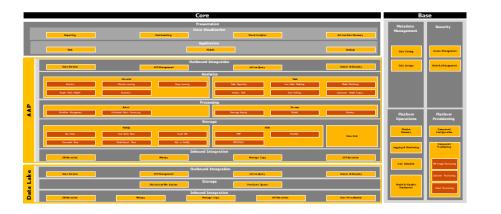
## B Use Cases Assessment

## C Capabilities Evaluation

# For the technology & architecture assessment, we build on our deep expertise in implementing data & AI platforms on Azure

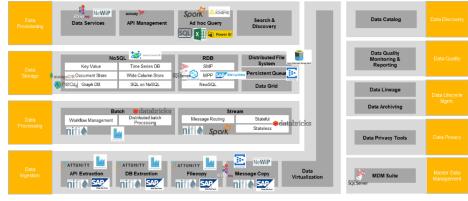
Deep Dive: Technology Dimension

#### **PwC** functional reference architecture



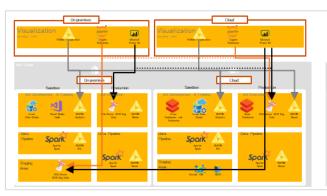
#### **Potential assessment aspects**

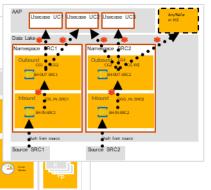
- Fit-for-purpose for key use cases
- Coverage of best-practice functional blocks
- · Technological maturity and integrability
- Scalability of technical architecture
- Usage of best-practice engineering fundamentals
- Azure consumption fees



## Status quo architecture assessment

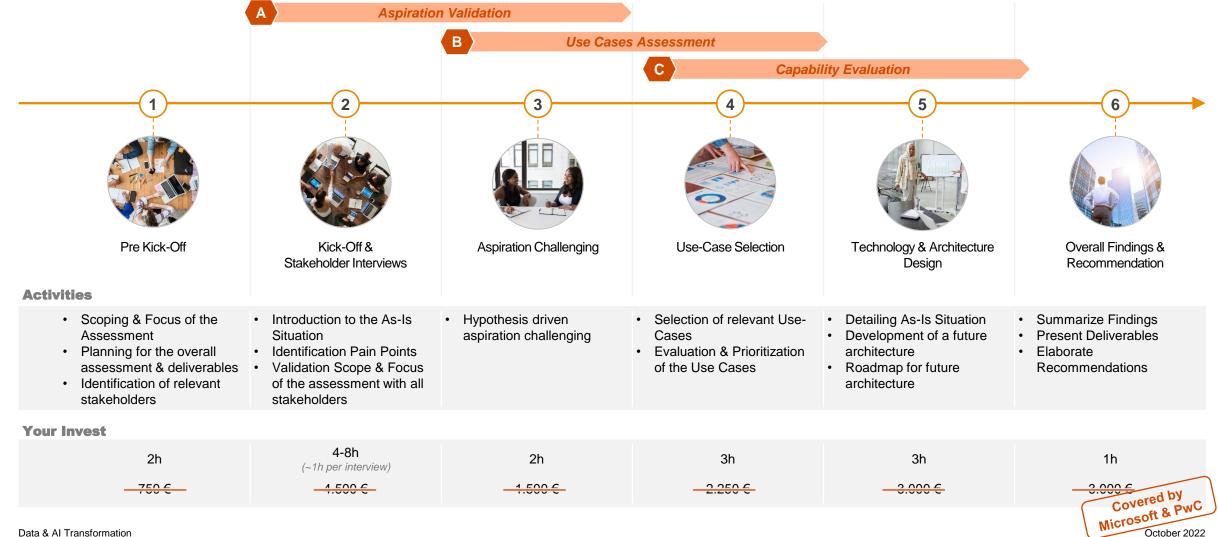
#### Target architecture design on Azure





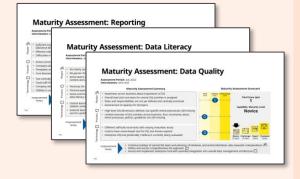
Data & AI Transformation PwC

# PwC experts work hand-in-hand with you to conduct the data strategy assessment with your business and IT stakeholder



# Depending on the jointly defined scope, the deliverables can include the following deliverables





#### **Maturity Assessment Results**

#### Completeness of data & Al vision

- Assessing soundness of strategic direction
- Challenge factors considered in data-to-value approach

#### **Common challenges and opportunities**

- Addressing common challenges and opportunities
- Prioritization of critical challenges and opportunities based on company situation

#### Current use case maturity

- Gap-analyses regarding possible features
- Assessment of analytical and technical maturity
- Comparison with best practices

#### Current data & AI capability maturity

- Assessing sufficiency of maturity with regards to data vision and use case requirements
- Detailed analysis of each capability component (people, process, technology)

#### **Outlook & Recommendations**

#### Future data & AI platform architecture

- Address different architectures and data platform setup
- Recommend best solution based on aspiration and business strategy

#### Recommended pilot use cases

- Assess use cases regarding feasibility, value and strategic alignment
- Select key-use cases based on chosen wayto-play

#### **High-level implementation roadmap**

 Drafting implementation roadmap for target architecture

#### Capability uplifts roadmap

- Recommending capability uplifts based and data vision and selected use cases
- Drafting roadmap of uplifts







# Why PwC & Microsoft?



# PwC and Microsoft combine their forces to provide you a holistic strategic and technical perspective for your data & AI transformation

Working in close collaboration, PwC and Microsoft help our customers to accelerate their data & AI transformation and to achieve sustainable results. Customers benefit from alignment of PwC's advisory experience in advancing strategic business objectives with Microsoft's proven technologies and applications.



# PwC offers a unique combination of industry and Data & AI expertise as well as strategic and creative thinking



PwC has been recognized by analysts as a global leader in data, analytics and AI consulting services

# Gartner.



Leader in Data and Analytics Services

"PwC is a Leader. It has an outcomedriven consultative approach, strong D&A and AI capabilities, broad market coverage and highly satisfied clients. Customers looking for a vendor that can combine D&A competency with consulting accelerators and technology expertise across a range of business domains, industries and ecosystems will find the scalable services of PwC a good match."

- Gartner: Magic Quadrant for Data and Analytics Service Providers, February 2022

#### Leader in Cloud Business Analytics Services

"PwC has a bold industry cloud vision and framework, one that leverages the firm's significant industry experience, knowledge, and partnership ecosystem. The company's data governance, regulatory, and compliance capabilities [...] are also strong. PwC has the cloud engineering talent and global delivery and innovation infrastructure to meet its clients' highest project standards."

- IDC MarketScape: Worldwide Industry Cloud Professional Services 2022 Vendor Assessment

# Forrester®

Leader in AI Consulting

"PwC transforms digital with strategic and leading data practices and platforms. As one of the first providers to incorporate data mesh as a foundation for digital edge and AI, PwC scores high on data integration. And PwC has led the way in what a data marketplace and exchange can be: a partner ecosystem that thinks about all data products, community collaboration, and gamification."

- The Forrester Wave™: Data Management Service Providers, Q4 2021

# Microsoft has awarded us as their 2021 'Partner of the Year' in Germany

## Congratulations

To the 2021 Microsoft Partner of the Year Awards winners and finalists! Award recipients were selected from more than 4,400 nominations. We look forward to recognizing these partners at Microsoft Inspire.

2021 winners and finalists >

#### Germany

Pricewaterhousecoopers LLP

#### PwC Germany: The Pioneer for a Global All-In Partnership

PwC is playing a leading role for advisories in co-selling practices and is building on an all-in innovation and co-development partnership with Microsoft. Through its thought leadership in Data and AI, extraordinary expertise in Microsoft Data Platforms, and extensive cloud resources, PwC was able to land two lighthouse projects this year. One was a state-of-the-art IT operation to assist a multinational pharmaceutical and life science company undergoing its largest digital transformation in Europe. The second built a scalable digital manufacturing platform as the foundation for the customer's multiyear journey to digitize and reinvent its worldwide manufacturing operations.

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Microsoft Inspire

# We have a proven track record in data strategy and execution across industries

Industry	Reference project description	I 🧘 Strategize	🛚 🛉 Design	III 🤰 Build	IV 📩 Sustain
Automotive	Data lake strategy, design and setup for automotive supplier	✓	✓	~	✓
Industrial Products	Data & analytics strategy for intralogistics company	~	✓	~	
Energy & Utilities	Data strategy for power & utilities company	✓	✓		
Consumer Products	Data management target operating model for a food company	✓	✓	~	
Retail	Data & BI architecture capability development for global retailer	✓	✓	✓	
Insurance	Data platform modernization for an insurance company	✓	✓	✓	✓
Banking	Data management strategy for a large international bank	✓	✓	✓	
Public Sector	Development of a "Once Only" data policy for a government	✓ 1.	✓		

# Data lake strategy, design and setup for automotive supplier

### **Client challenge**

- Data was locked in silos within each business unit and not shared across divisions and functions, hence limiting the data-driven innovation potential
- Each team applies different technologies and analytical methods, which makes it difficult to collaborate and scale use cases across the organization

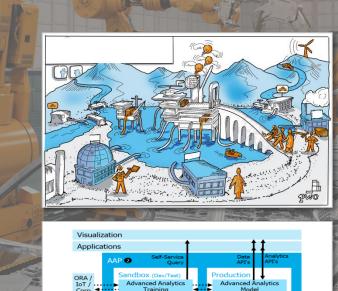
### Scope of work

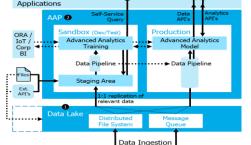
- · Development of a Data Lake vision, mission and guiding principles
- Analysis of technical and organizational requirements for a central Data Lake
- · Evaluation of different architectural approaches and technologies
- Design of a technical architecture and organizational setup
- Approval of the Data Lake strategy and concept by the IT management board
- · Implementation and roll-out of the Data Lake

- Enterprise-wide Data Lake concept was aligned and implemented
- · Data lake was successfully launched in the organization
- Several use cases were implemented on the Data Lake and users were enabled to use the new technology
- First use cases were supported through development until deployment to production at scale









# Data & analytics strategy for intralogistics company

### **Client challenge**

- Recently conducted assessment of client's analytics capabilities revealed pain points preventing successful implementation of analytics use cases
- Client aimed to strengthen its analytics capabilities to drive implementation of analytics use cases in business units and supporting functions

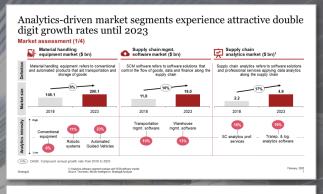
### Scope of work

- Conducted a high-level market and competitor assessment to confirm the rationale to invest in analytics capabilities
- Collected, evaluated and prioritized four business process and commercial use cases as basis to derive capability requirements
- Developed a capability target picture covering capabilities in the dimensions organization, technology and data management

### Achievements

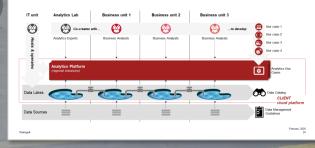
- Derived clear recommendations for action including an estimation of the investment effects and required capabilities
- Developed and aligned an implementation roadmap including clear responsibilities





Both business processes and commercial analytics use cases were identified and prioritized Use case analysis (19)

The target picture composes of an analytics platform, unitspecific data lakes and a lab that co-creates solutions



# Data strategy for power & utilities company

### **Client challenge**

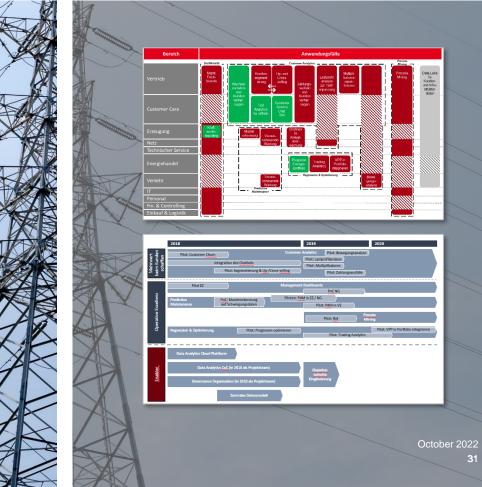
- Data management and analytics were defined as key capabilities in the company's digital strategy, but a clear implementation plan was missing.
- First analytical Proof-of-Concepts were developed with external start-ups, but were missing alignment to the business strategy and clear targets.

## Scope of work

- A holistic analysis of data management and analytics capabilities was conducted, revealing the current maturity and target picture for the enterprise.
- Many data analytics use cases were identified and prioritized according to their expected benefits, implementation complexity and strategic fit.
- The requirements for data, technology, people, processes and culture were determined, consolidated and structured into concrete action packages.

- Well-fitting organizational structure and governance model.
- Short- and midterm roadmap, which serves as the execution plan for implementing the target state for data analytics within the company.
- Confirmation by the management board as well as all business unit leaders and stakeholders about the data strategy.





# Data mgmt. target operating model for a food company

### **Client challenge**

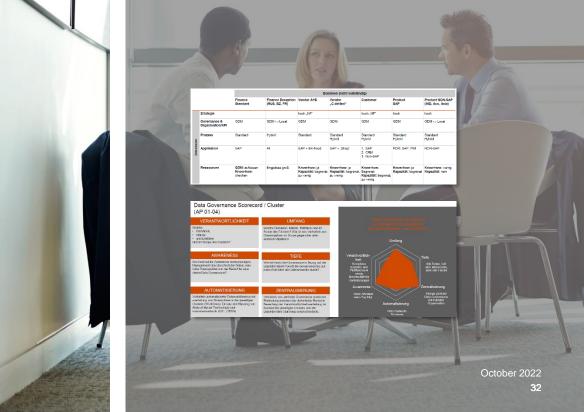
• Multinational food processing company wanted to set up a global centralized Data Governance across all data domains and thus needed to define a target operation model for the global data management division

### Scope of work

- Design and implementation of a holistic product data framework
- Expansion of the data governance organization to all data domains and on a global level
- Development and expansion of a new product data organization
- Extension to further data domains such as customer, supplier, logistics, finance

- · Significant increase in product data quality and other data domains
- Development of an efficient global data organization
- Ensured data governance within all country organizations





# Data & BI architecture capability for global retailer

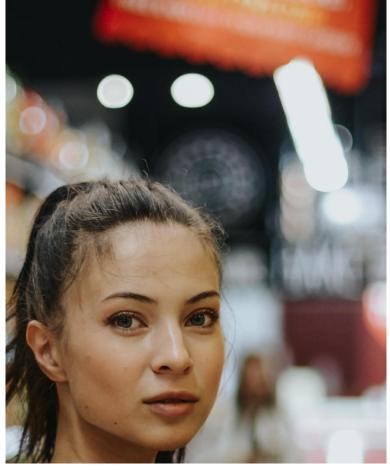
### **Client challenge**

• The client, an international retailer, wanted to modernize its data management and BI landscape and therefore needed to develop data & BI architecture capabilities, to support the transformation from traditional data management and reporting to Big Data, Analytics and Artificial Intelligence.

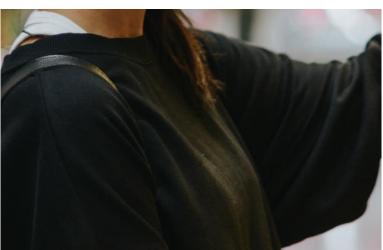
### Scope of work

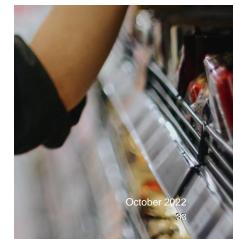
- Status Quo Analysis: Conducting interviews with team and department heads to assess existing structures, skills, ongoing projects and challenges.
- Vision Development: Description of the vision of a data platform including architecture components as well as required architecture roles and services.
- Roadmap creation: Definition of recommended action to implement the vision, and planning of actions on a strategic roadmap.

- Increased the effectiveness of the architecture team by reviewing ongoing activities for their contribution to strategic goals and structuring them into a small number of strategic programs that can be managed more efficiently.
- Accelerated the digital transformation of the enterprise by extending the data & BI architecture vision and objectives to include analytics and AI, which represent future competitive advantages for the enterprise.









# Data platform modernization for an insurance company

### **Client challenge**

- Nearly all data was stored on IBM Mainframe technology which makes analytics very expensive.
- Only structured data was available for analytics.
- A new platform was needed to enable large scale data & analytics projects.

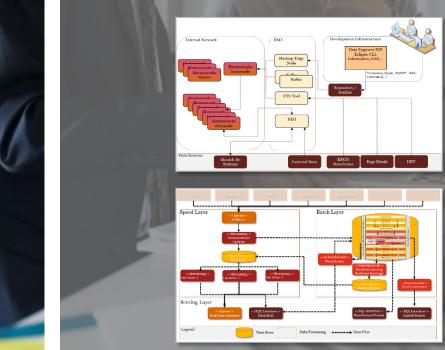
### Scope of work

- Conception of Hadoop platform including governance, security and role concept, taking into account existing technologies, skills and processes.
- Joint implementation of a first use case on the cluster to familiarize the internal DevOps team with the new technology.
- Ensuring availability of metadata and data lineage.
- Operationalization of use cases.

### Achievements

- Established an enterprise wide single source of data for analytics.
- Improved speed and flexibility of big data ingestion and management.
- Enabled advanced analytics and machine learning use cases.
- · Reduced IT infrastructure and software license costs.





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# Data management strategy for a large international bank

## **Client challenge**

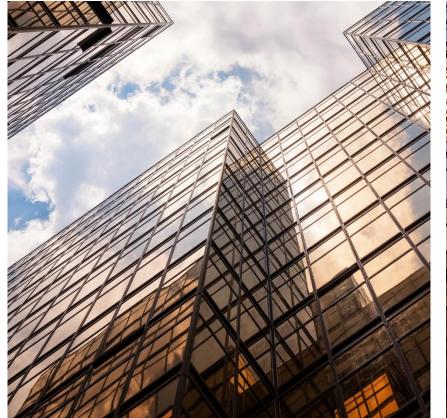
- Merger of two legal entities require one common data strategy and data management framework
- · Lack of organizational foundation of data management and strategy
- Distinguished IT and business strategies for data management capabilities

## Scope of work

- Alignment of data strategy, regulation and post merger activities alongside major shifts in technology and architecture
- · Scoping of existing frameworks and responsibilities
- Integration and migration concept and implementation of data management tools

- Aligned roadmap for required data management maturity levels for separate entities and functions
- Definition of one common metamodel for data management purpose
- Mapping of local data assets





# Development of a "Once Only" data policy for a government

### **Client challenge**

 Government client aimed to introduce a policy entailing that citizens and businesses provide diverse data only once in contact with public administrations, while public administration entities take actions to internally share and reuse this data

### Scope of work

- Conducted a global benchmarking study to identify best practice data management principles for "Once Only" policies and technical components
- Developed a policy draft, technical architecture model, governance model and high-level implementation plan for the policy's rollout
- Aligned the policy with senior government stakeholders, prepared a legislation and ensured an accepting legislation vote

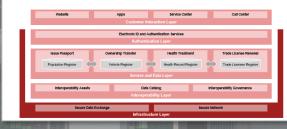
### Achievements

- Launched the "Once Only" data policy and derived clear recommendations for the implementation of the data policy across government services
- Integrated and aligned the data policy with existing e-Government at federal and local public administration entities





The high level architecture composes of five layers; Elements on each layer need to be designed according to "Once Only" High Level Architecture



Launching the "Once Only policy" requires close collaboration on federal and local level during the implementation High Level Implementation Plan



# Thank you!



## Michael Bruns

Partner +49 160 2600 192 Michael.Bruns@pwc.com PricewaterhouseCoopers GmbH Goltsteinstraße 14, 40211 Düsseldorf



## Andreas Odenkirchen

Director +49 151 1553 5019 Andreas.Odenkirchen@pwc.com PricewaterhouseCoopers GmbH Bernhard-Wicki-Straße 8, 80636 München



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