# Technology enablement in data-driven businesses

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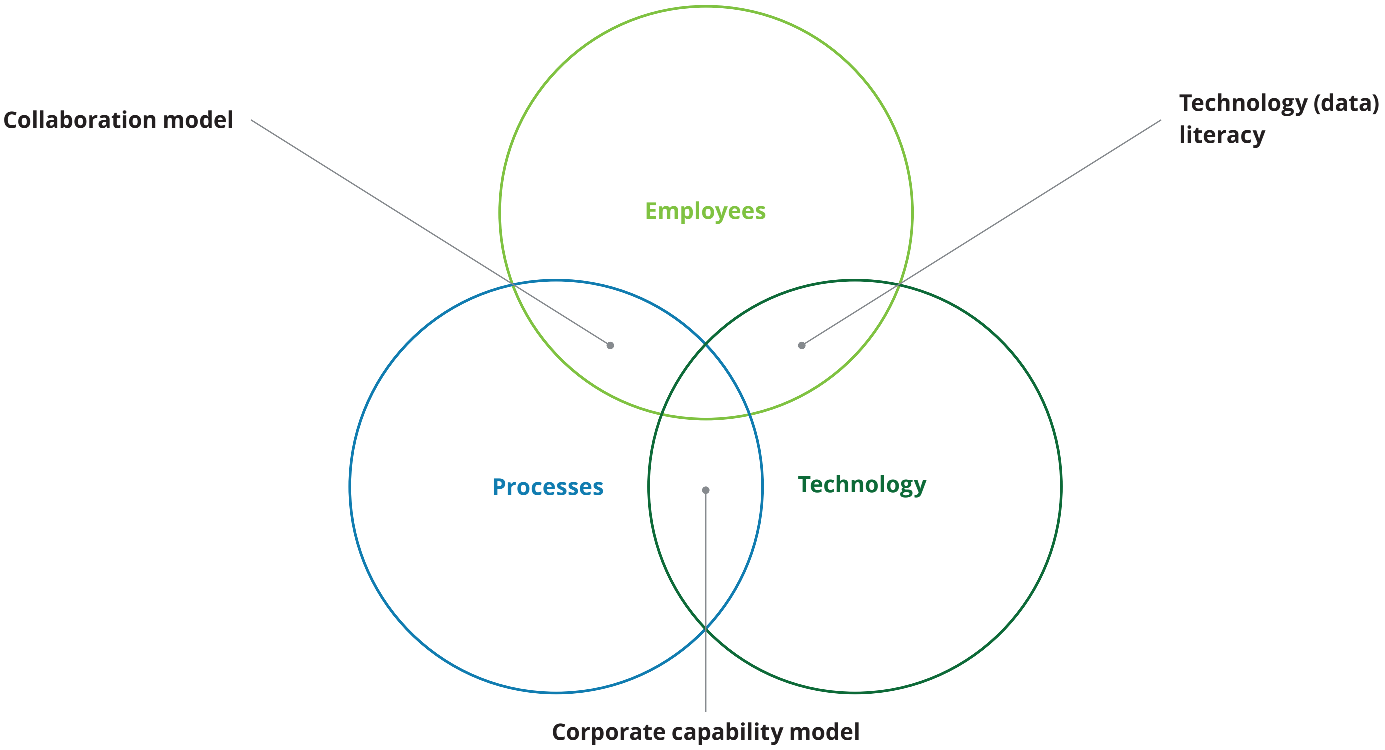
# Introduction

Modern enterprises leverage data and AI to keep up with the high dynamic of an ever-changing business world. On the way to achieve that goal almost all of our clients face the same challenge: To transform their strategy, operating model and way of doing business such that data is used to drive the corporate capabilities used in processes that generate value.

One of the recent concepts of achieving this is the data mesh, that shifts responsibilities towards the business to produce data products that are standardized in their creation as well as in their access. The data mesh paradigm, however, is not a purely technological invention, but rather a socio-technological endeavor that brings together technology, employees, and corporate processes. The classical Venn diagram of these three is given below. We have added the usually omitted descriptions of the links between the adjacent pairs: Employees possessing an intuition for the capabilities and limitations of technology ("technology literacy"), the enterprise being able to use technology in processes ("capability model") and the employees working together along the process landscape ("collaboration model").




Achieving literacy, data capabilities and collaboration are at the core of a successful transformation. Here, Deloitte presents a series of papers that explain key aspects how to achieve these three along the transformation towards becoming a data driven enterprise. The series is structured into strategic, tactical and operational aspects of data driven work.

Beginning with the strategy framework we are working along, we introduce our orchestrator for the data transformation journey. As the major tactical pillars of the transformation we focus on the required governance as well as the data-centric process landscape in two further articles.

These concepts are underpinned by operational tools such as data catalogs, data quality and IT platforms which we are also covering in an article. Since these developments need to be sustained by specialized change management, a separate article is dedicated to this topic.

The journey to a data-centric enterprise is a complex transformation that continues to bring new challenges and insights. We will continue to expand and add to our series of articles.

# Technology enablement in data-driven businesses

For a successful transformation into a data-driven business, companies have to enable certain roles and processes through tailored services and technology. The tools they choose for this process and the way these tools interact play a crucial role, whether it is about shaping the technological landscape or developing a more targeted response to user demands. Find out more in this article.

To stay competitive in a disruptive environment, enterprises have to adapt to changes every day. This adaptation process, known as "transformation", impacts everything from corporate strategy, the business model and technology though to design, process optimization, talent and sustainability. In our practice, we have found that for all transformations is an ambition to optimize, expand or reimagine their business as part of an effort to increase margins, grow sales or change the portfolio mix.

These days, more and more enterprises see data as a real catalyst for business value, and becoming a data-driven business is one viable path of transformation to stay competitive in the future. The paradigm is shifting with approaches like the Data Mesh, a key enabler for data-driven transformations. This socio-technological approach federates data ownership among domain data owners, publishes data as a product and offers users self-service capabilities. This brings about radical change within the organization itself, its processes and its underlying technologies. Enterprises tend to underinvest in talent, change management and communication, and the lion's share of the transformation budget is allocated to technology, business and process adaptation. To avoid sunk costs, it is best practice to transform the technological landscape in parallel with changes to the business as a whole as well as individual processes. The focus of this article is a structured method of selecting, building and running the right technology and services for a data-driven business.

In the articles "Processes in a data-driven business" and "How data domains help data-driven businesses generate value", we describe Deloitte's insights into becoming a data-driven business through organizational and process-driven change. To recap briefly, when companies make an effort to generate value through data-related use cases, employees face various challenges and pain points that could be mitigated by providing a data platform and related services. The main purpose of this platform from a business perspective is to enable data products to be shared and consumed on a marketplace, which will ultimately fuel their data-driven use cases. However, in order to manage these data products properly and make data-related use cases effective, it is vital to have the right data product lifecycle process in place. In the Data Mesh, this process uses a federated governance model to determine how data products are created and shared and who the functional owners of those data products are in the distributed data domains.

To succeed with this new process in a data-driven business, the enterprise must bring together the relevant roles, processes and technology with a series of dedicated services enabled by technologies and tools available on the target platform. One example of these services is data exploration. When users search for data products as part of the process to qualify a new data product, they can rely on the data exploration service, which comprises the data marketplace, data catalog and ontology tool. Basically, the services are there to support the staff in a data-driven business with the support of tailored tools and technologies on a central data platform.

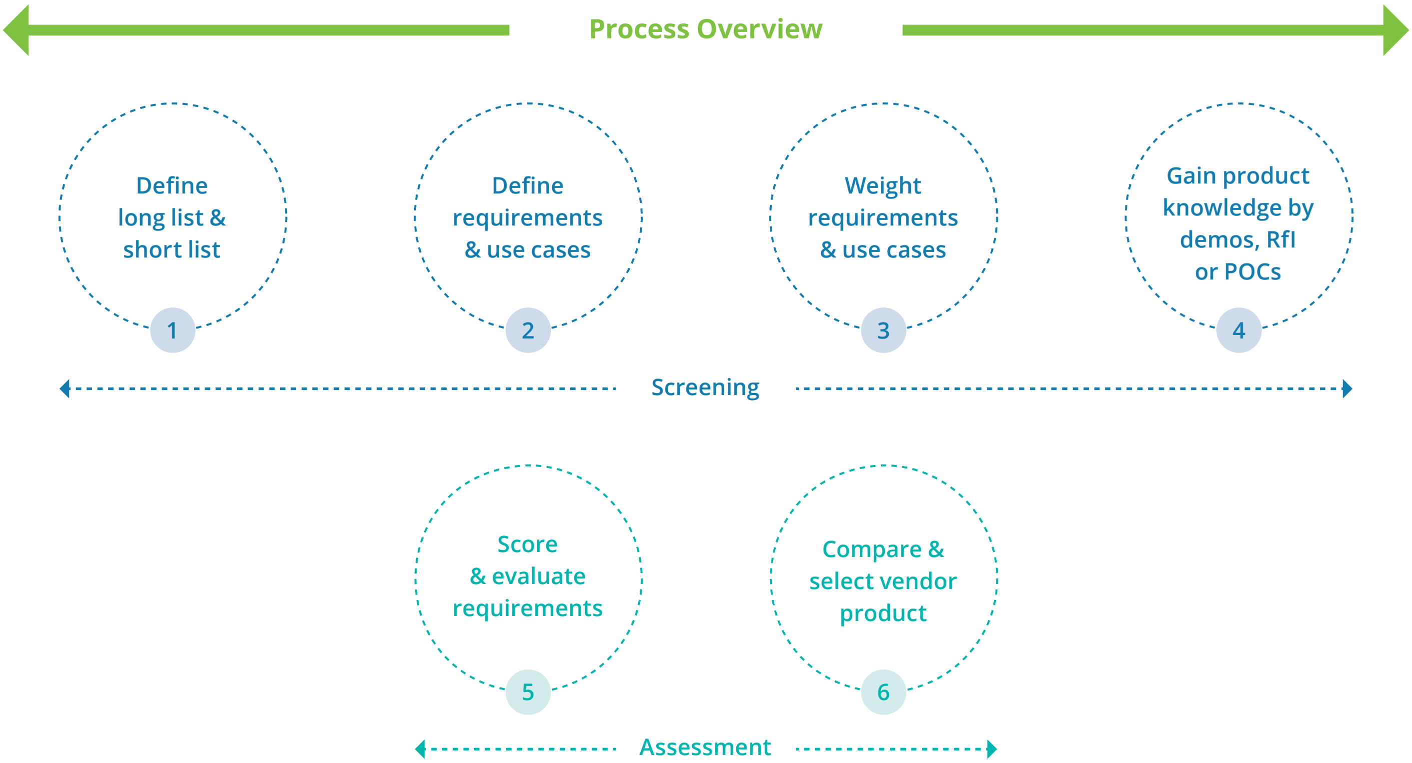
To tailor services for a new data-driven business, the first step is to create a matrix for the process steps and their responsible roles. The resulting matrix maps the roles and processes with the supporting services and may combine them in logical service groups to ease management. In a final step, each service is allocated the technologies and tools they need. Thanks to the defined roles and responsibilities for each process, users can select the right capabilities from a user-centric perspective based on their detailed requirements.

Data quality management is an example of a service group that provides services from data quality monitoring and though to quality standards. Each role has specific responsibilities and tasks to perform in each process phase, and the matrix shows how dedicated data quality management services can help them fulfill their roles. Throughout the data product lifecycle, data product managers define the data quality standards and dimensions, data stewards profile and monitor data, data custodians define the data quality gates according to agreed quality standards and developers implement those data quality gates. The technologies and tools that enable these services help the users accomplish their tasks faster, more cost-efficiently and with greater accuracy. Now let us turn our focus to a standardized approach for selecting the right technology and tools for each data-driven business service.

**Data product lifecycle process**

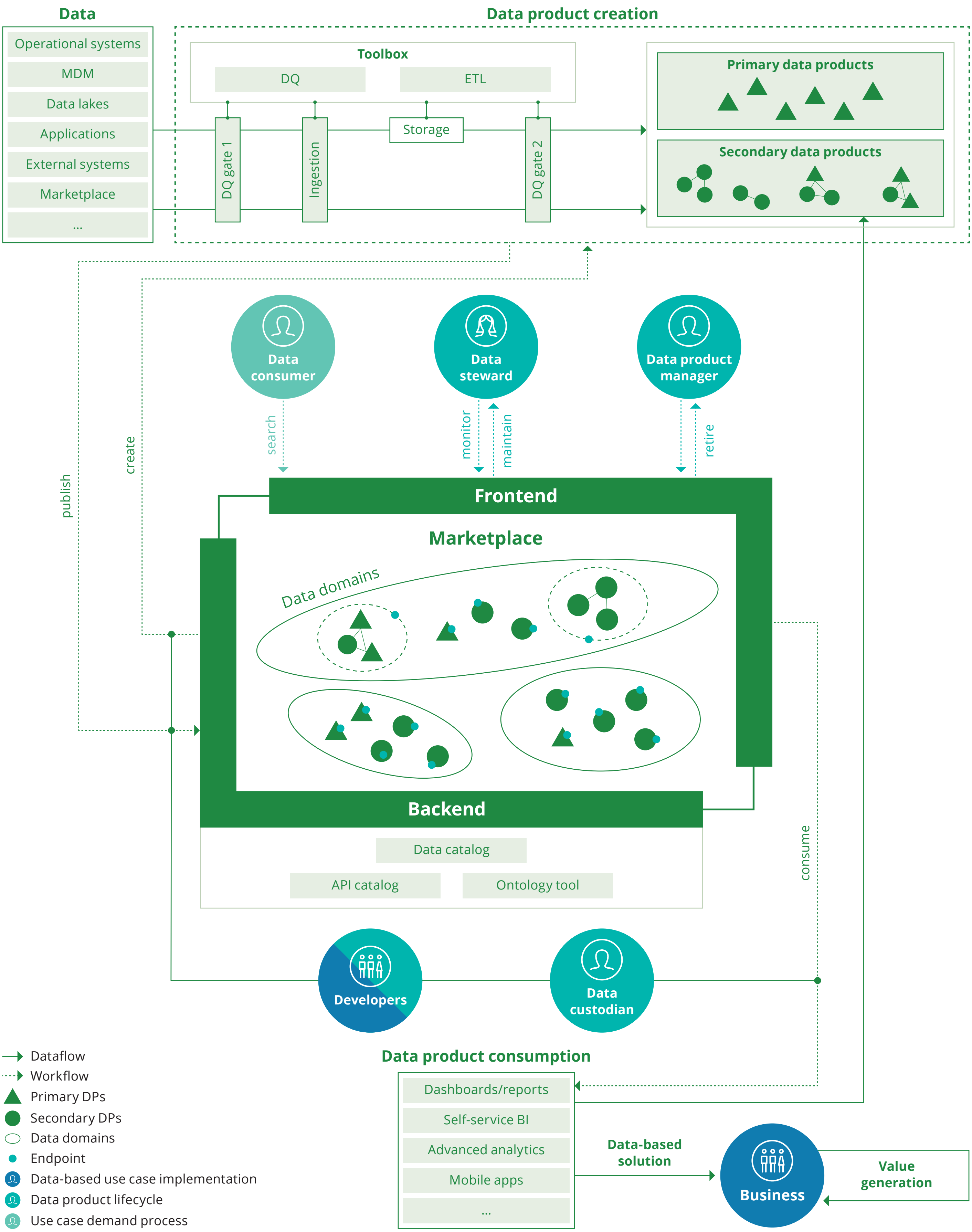
| | Qualification | Modelling | Development | Operation | Retirement |
|---|---|---|---|---|---|
| Data Product manager | | Data quality standards & dimensions | | | |
| Data steward | | | Data profiling | Data validation<br>Data quality monitoring | |
| Data custodian | | | Data quality gates | | |
| Developers | | | Data standardization & cleansing | | |

Illustrative




Taking the example of data quality management one step further, data-driven businesses need the right toolset for every data related-service. Within a service group, each service should have one specific tool that exactly aligns with its user's needs. Selecting the right tools and technologies plays a crucial role in the transformation into a data-driven business. The key thing is that both tools and technologies address the exact demands of the users. That is why it is so important to devote a great deal of attention to determining the user requirements for such a tool. The process of selecting a vendor allows enterprises to formally screen the requirements and vendor solutions as well as their quantitative and qualitative assessments. Beyond this, it takes an agile approach to move the process forward and gather insights for the related vendor and tool capabilities. It helps to evaluate any further needs of the users as the process continues, making sure to keep the selection process as efficient yet as thorough as possible to reach the right decision. We build on Deloitte's previous experiences and best practices, the available technologies within the target enterprise as well as the requirements of all potential stakeholders to envision future tools.

The information gathered during the screening process helps the enterprise assess whether the vendor suits their technological landscape and covers their actual needs. Within the modern paradigms of a data-driven business, the targeted tool and its technology form part of the overall data platform, which can make the selection process even more complex. It implies that the tools and technologies are interoperable and linked in a robust network. In other words, you must be able to integrate the tools in the platform as needed, otherwise the system may face inefficiencies or even security risks. Following Deloitte's vendor selection approach, enterprises can be certain that all tools have been selected in line with the tailored requirements, are interoperable with existing tools and technologies and empower users to generate value from their data.  When tools are combined on a data platform, enterprises can operationalize the processes and organizations by finally enabling the respective services.


Data
Operational systems
MDM
Data lakes
Applications
External systems
Marketplace
...
Data product creation
Toolbox
DQ
ETL
Storage
DQ gate 1
Ingestion
DQ gate 2
Primary data products
Secondary data products
publish
create
Data consumer
Data steward
Data product manager
search
monitor
maintain
retire
Frontend
Marketplace
Data domains
Backend
Data catalog
API catalog
Ontology tool
consume
Developers
Data custodian
Data product consumption
Dashboards/reports
Self-service BI
Advanced analytics
Mobile apps
...
Data-based solution
Business
Value generation
Dataflow
Workflow
Primary DPs
Secondary DPs
Data domains
Endpoint
Data-based use case implementation
Data product lifecycle
Use case demand process

Businesses become more data-driven by selecting earmarked tools and technologies for the purpose of specifying, sharing and consuming data products on a central data platform and with self-service capabilities. The resulting platform shows its benefits especially by fostering collaboration, efficiency, scalability and a high degree of automation.

The marketplace is the pivotal element for a data-driven business, as it abstracts from the complexity of underlying technologies and tools, so that business users can focus on value generation. Here, data demand meets use case-oriented data consumption. The marketplace offers high-quality data products, makes them easily discoverable for everyone in the organization and regulates user access. Data Mesh also offers a self-service access model for data consumers. Enterprises can leverage insight on the marketplace to identify the demand for new data products and kick off the creation process.

In the following examples, we will outline how data-driven businesses use technology and tools to enable roles and generate value: data stewards maintain metadata in the data catalog and model domain knowledge in the ontology tool to avoid redundancies in data products as well as to make them discoverable and self-explanatory for business users. Developers use ETL, data quality tools and low-code/no-code technologies to develop trustworthy data products in an efficient way. Data custodians maintain data lineage in the data catalog and publish the APIs of different data products in the API catalog to make them accessible. Once a data product is available in the marketplace, business users can start developing data-centric use cases using advanced analytics and/or reporting tools.

We have shown in the above examples that technologies and tools are a vehicle to provide data-driven services that link processes within the organization. The way technology, processes and people interact is an integral part of a data-driven business to generate value-add. That is why selecting the right user-centric and target-oriented tools in the Data Mesh concept is so vital for a successful transformation.

# Contributors


**Mark Arndt**
**Consultant**
Strategy, Analytics and M&A
+49 151 1917 5124
maarndt@deloitte.de

**Dr. Max-Hendrik Böttcher**
**Manager**
Cyber & Strategic Risk
+49 151 5448 3572
maboettcher@deloitte.de

**Anica Buchholz**
**Manager**
Human Capital
+49 151 5448 4563
abuchholz@deloitte.de

**Thiemo Eberle**
**Senior Consultant**
Enterprise Performance
+49 151 1829 5033
teberle@deloitte.de

**Frank Eisenhauer**
**Director**
Strategy, Analytics and M&A
+49 151 5448 3868
feisenhauer@deloitte.de

**Dr. Christoph Euler**
**Senior Manager**
Strategy, Analytics and M&A
+49 151 1268 3336
ceuler@deloitte.de

**Markus Hafner**
**Senior Consultant**
Strategy, Analytics and M&A
+49 151 5448 4069
mhafner@deloitte.de

**Kai-Uwe Hess**
**Partner**
Enterprise Performance
+49 151 1829 4406
kahess@deloitte.de

**Margaretha Hirsch**
**Senior Consultant**
Strategy, Analytics and M&A
+49 151 5448 4071
mhirsch@deloitte.de

**Paul Holbein**
**Senior Consultant**
Strategy, Analytics and M&A
+49 151 5807 6346
pholbein@deloitte.de

**Martina Hornung**
**Partner**
Human Capital
+49 151 5807 3900
mhornung@deloitte.de

**Dr. Benjamin Klör**
**Manager**
Enterprise Performance
+49 151 5448 4579
bkloer@deloitte.de

**Dr. Sebastian Olbrich**
**Partner**
Strategy, Analytics and M&A
+49 151 1488 0375
solbrich@deloitte.de

**Ralf Pierson**
**Senior Consultant**
Human Capital
+49 151 2103 3858
rpierson@deloitte.de

**Christian Roese**
**Senior Specialist**
Strategy, Analytics and M&A
+49 151 5807 6239
croese@deloitte.de

**Marco Ruetten**
**Manager**
Enterprise Performance
+49 151 5807 5861
maruetten@deloitte.de

**Jan Scherpinski**
**Senior Manager**
Strategy, Analytics and M&A
+49 151 5448 3411
jscherpinski@deloitte.de

**Friedemann Schestag**
**Consultant**
Strategy, Analytics and M&A
+49 151 1268 3791
fschestag@deloitte.de

**Tim Staab**
**Consultant**
Strategy, Analytics and M&A
+49 151 1488 1747
tistaab@deloitte.de

**Julian Steiner**
**Senior Consultant**
Human Capital
+49 151 5807 4575
julsteiner@deloitte.de

**Aizhan Suleimenova**
**Consultant**
Strategy, Analytics and M&A
+49 151 5448 3524
asuleimen@deloitte.de

**Tobias Wätzig**
**Senior Manager**
Strategy, Analytics and M&A
+49 151 5800 1565
twaetzig@deloitte.de

**Marc Willemsen**
**Consultant**
Strategy, Analytics and M&A
+49 151 1488 0730
mawillemsen@deloitte.de

**Jan Wohde**
**Consultant**
Human Capital
+49 151 5448 4643
jwohde@deloitte.de

# Contacts

**Tobias Wätzig**
**Senior Manager**
Strategy, Analytics and M&A
+49 151 5800 1565
twaetzig@deloitte.de
Tobias Wätzig has long-term experience in Analytics, AI & Data Management. Thereby he has designed conceptualized and implemented various BI and (Advanced) Analytics solutions including as well as modern data platforms. In this connection he performed roles as expert for data mesh, and sustainability analytics, certified team lead of agile delivery teams as well as delivery lead for multiple workstreams in large scale transformation programs. The technology focus in his context has been Azure, AWS, Snowflake and SAP.

**Christian Roese**
**Senior Specialist Lead**
Strategy, Analytics and M&A
+49 151 5807 6239
croese@deloitte.de
Christian is a senior specialist lead in our Analytics & Cognitive Offering and has over 16 years of experiences of data management consultancy Christian is part of Deloitte Consulting since October 2018 and supported in his career mainly banking/ insurance sector clients for digital transformations. Since 2004 he was responsible for various data management initiatives for big data, data warehousing, data quality or data governance up to the level of program manager and solution architect.

**Dr. Benjamin Kloer**
**Manager**
Enterprise Performance
+49 151 5448 4579
bkloer@deloitte.de
Benjamin is working as a Manager for Technology Strategy & Transformation at Deloitte. He acted in different roles to coordinate and deliver transformation projects in various industries for building the data-driven company. Benjamin's professional interests are focused on the full lifecycle of data management, including data strategy definition, data governance design, as well as data value creation by the means of data monetization and modernization.

# Glossary

**Data Mesh**
The data mesh is a domain-driven socio-technological approach for creating decentralized data architectures. It is based on decentral governance structures as a foundation for generating sustainable business value using standardized and re-usable data products. It relies on a flexible collaboration model accross the entire enterprise.

**Data Product**
A data product is a set of data that is made available for the usage of employees or systems via a standardized API on a marketplace. Its purpose is to realize use cases and therefore to enable the implementation of data-driven services.

**Data as a product**
Synonymous to Data Product.

**Use Case**
A use case creates business value by fulfilling an explicit objective. Use cases are based on existing Data Products.

**Data Catalog**
A data catalog is the central inventory for all data assets within the company. It is made understandable via a glossary of frequently used terms and by highlighting the technical and business data lineage as well as transformation logic.

**Data Governance**
Data Governance is the discipline that connects data processes, and corresponding roles and responsibilities by formulating binding enterprise-wide policies.

**Ontology**
Ontologies are formalized descriptions that capture relations between business entities and their ab-stract realization as data.

**Data Domain**
A data domain takes ownership of data relevant to a common area of interest and implements roles that are responsible for expanding and maintaining the usability of this data.

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