



BUSINESS
TECHNOLOGY
STANDARD

ARTICLE

OPERATING MODEL FOR DATA GOVERNANCE AND MANAGEMENT

How to manage data as a strategic
business asset?

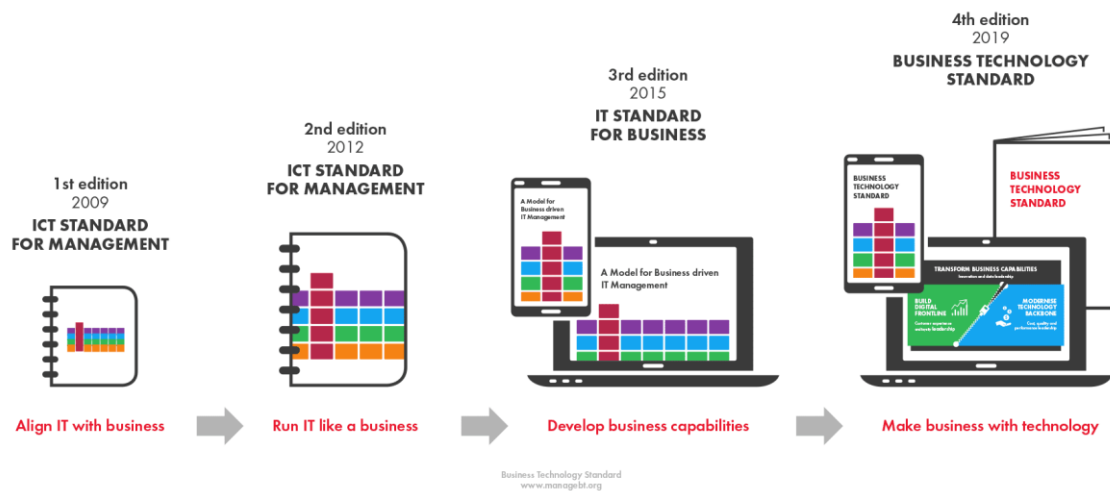
By Business Technology Forum



About Business Technology Standard

The **Business Technology Standard** (or BT Standard) is an open-source management framework to plan, build and run information technology in today's technology-driven business world. It has been constantly developed and renewed during the past 10 years with global companies and public organisations. It is recognised today as one of the leading best practices and used in hundreds of globally operating companies and public organisations, especially in Nordic countries.

The fourth edition has been completely rewritten and upgraded, and the scope of technology management has been extended from information technology to business technology.



The Business Technology Standard has been developed by the **Business Technology Forum**, a community of forerunner companies and organisations collaborating based on a platform economy model where every company can benefit from each other's development input and efforts.

Team Effort Behind This Document

This document has been written by Sofigate in cooperation with CGI and Valmet and commented by the university development partners Aalto University and King's College London.

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Introduction – Turning data into value

Data is one of the most valuable resources for any company. It is a strategic business asset with value that is dependent on the quality, relevance, and scope of the data. Yet there are still many organisations struggling to safeguard and manage their data assets in a cohesive manner. An important question to ask yourself is: am I managing data with good oversight and controls in place? Am I gaining a competitive advantage by using data?

New technologies have led to a data explosion. At the same time, technologies provide new ways to store, process, and mine valuable insights. While some companies have their foundations built on the effective use of data, many organisations still seem overwhelmed by the opportunities data offers.

Turning data into value is a transformation journey. The benefits of data grow as the company's maturity level in data management increases. A completely new mindset is essential. Clear data ownership, roles, and responsibilities, as well as an attitude for value creation are required. Corporate strategy sets the ambition level and drives the transformation towards becoming a data-driven company.

Data is Only Valuable for the Business, When it is Well Governed and Managed

Typical challenges are found when trying to measure the value of data. Organisational pressures on time and money set constraints on ensuring high data quality and nurturing the value of data. Organising the existing information about data within the enterprise, as well as handling the integration of multiple sources is not straightforward. The approach and implementation of data governance needs to reflect the organisation's cultural background.

The Business Technology Standard's Operating Model for Data Governance and Data Management guidebook provides best practices and leadership models to support the transformation of generating value out of data. The operating model has been developed together with global companies. It provides an overview of the various dimensions related to data management and governance, which need to be looked after in order to maximise the value of data.

Data is only valuable to the business when it is well governed and managed. The data asset management model defines the following perspectives, which require attention:

- Data usage and delivery
- Data Quality
- Security and risks
- Ownership
- Governance and roles
- Culture
- Solution and tools.

When picturing the data asset as a diamond, these different perspectives make up the seven facets of the diamond (see the illustration below). Like a real diamond, value comes from all sides being in good condition. Business benefits can be best fulfilled if all the sides of the diamond are in excellent shape. Therefore, the content of the data asset diamond must be managed.

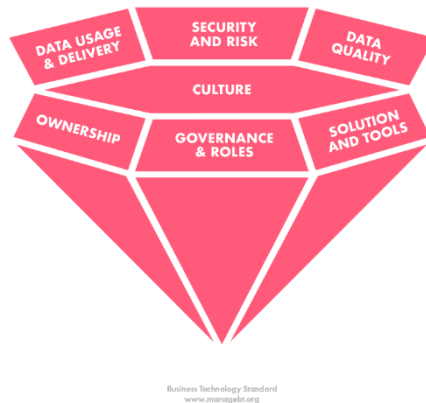


FIGURE 1: DATA ASSET DIAMOND

How to Build Data Capabilities?

The transformation from managing data to delivering business value constitutes a journey. It requires focus, practice, and determination to advance through the different levels of data management maturity and establish solid data capability. The higher the level of data management maturity an organisation reaches, the faster the pace is for value creation.

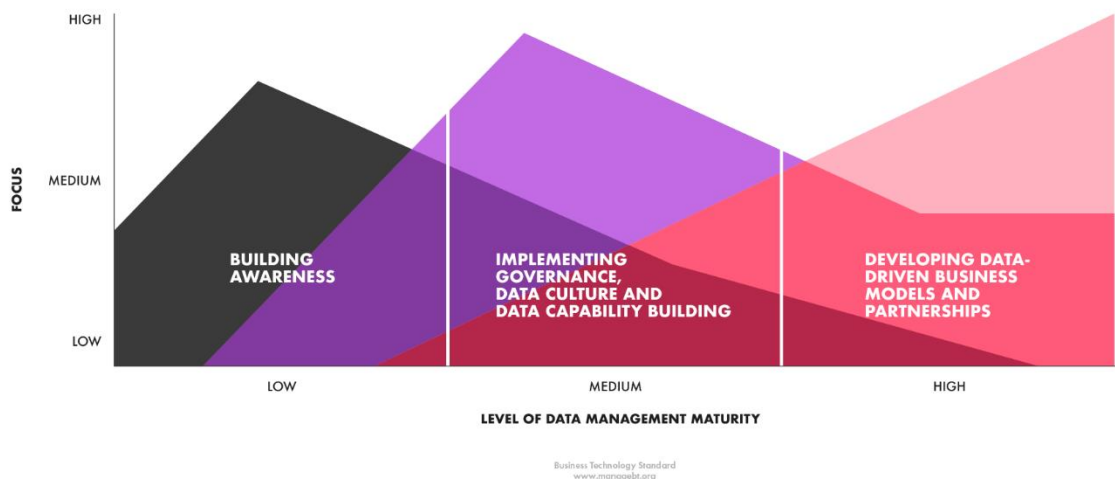


FIGURE 2: JOURNEY OF DATA MANAGEMENT MATURITY

Three Phases of Data Maturity in Organisations

The 'data journey' starts by building awareness inside the organisation – awareness about data being everywhere and being everyone's concern. Everyone, both within pure technology and across the wider business, should acknowledge that data is a valuable resource for business operations, gaining insights, enabling innovation, and reaching strategic goals.

At the **first level of data maturity**, companies have data stored in secure business systems. The importance of data is recognised. Reports, insights, and analytics are generated manually based on historical data. Data quality issues are typically addressed in a reactive manner.

The **second level of data maturity** is characterised by implementing governance and nurturing data culture, in order to lay the foundation for new data capabilities. A completely new mindset, clear data ownership, roles and responsibilities are needed. This organisational and cultural change requires careful attention and dedicated change management practices. Data governance plays a decisive role by establishing organisational principles. Such principles are to be understood as core beliefs, which are applied on an everyday basis.

Organisations on this medium level of maturity invest in data technology infrastructure with the aim of offering extensive internal data services to the business. A centralised data function is established. Data quality is continuously and proactively managed.

At the **highest level of maturity**, organisations develop data-driven business models and partnerships. Sharing data, not only inside the organisation but also within one industry sector in the form of benchmarking, can create high business value. The pooling of data allows for a much larger and reliable data set. This leads to better predictions, deeper insight into efficiency, and smarter decisions on how to operate or plan new investments. The hesitation of sharing data with competitors is overcome by using independent organisations, which act as trusted data intermediaries. Such joint-industry initiatives provide companies secure means to share data and create value from data. The fact that using data does not deplete it, allows any company to use the same data in multiple ways and even engage in different data-sharing arrangements. This way the value derived from the data can be maximised.

At this stage data is truly considered as a key asset, product, and business enabler. Data widely supports the decision making in the organisation.

Typical Pitfalls and How to Avoid Them

On the transformation journey to reach a higher level of data management maturity, various pitfalls can jeopardise success.

Three typical pitfalls are:

1. Unclear Data Ownership

Key data about customers, products, or materials should be shared across the organisation. Clear ownership and accountability are needed to define and reach data quality targets. They ensure a common definition and understanding of the data and provide guidance with resolving emerging data issues. Even if data is created in one application, it becomes an asset for the whole organisation. Thus, it must be managed on a higher level than just the application, which happened to be the tool for its creation. Applications and their different versions come and go, while the data remains.

2. Unwillingness to Change Processes Linked to Data Quality

Data does not simply exist; it is created every day. Its life cycle starts already when you consider how reality can be best represented by data. Which data needs to be captured to enable the desired business processes? Which additional data is required to allow data consumers to utilise it and make sense out of all available data? When observing data quality issues, the superior solution to cleansing the data afterwards is to ensure that it is created at a higher quality level in the first place.

3. Not Recognising the People Dimension

The biggest obstacle in such transformation journeys are usually people. A recent study* suggested that people represent 62,5% of the biggest challenges, followed by 30% attributed to processes, while only 7,5% are seen to be related to technology. It is crucial to dedicate enough effort to change management. The status quo culture, internal politics, ambiguity in data ownership, and budgetary competition do not support the necessary transformation and need to be addressed.

Turning Data into Value

Machine learning, robotics and artificial intelligence are driving increased automation and replacement of human beings for repetitive tasks. The Internet of Things (IoT) enables connected living, in which cars, fridges, heating, watches, etc. are all connected and can be controlled via the internet. All these sources create data that must be managed.

New laws and regulations on data handling, such as the GDPR, call for a higher focus on regulatory compliance in order to manage the related risk. Data handling ethics are likewise getting more and more attention. Handling data in an ethical way is required to be successful in the long run and represents one part of an organisation's social responsibility.

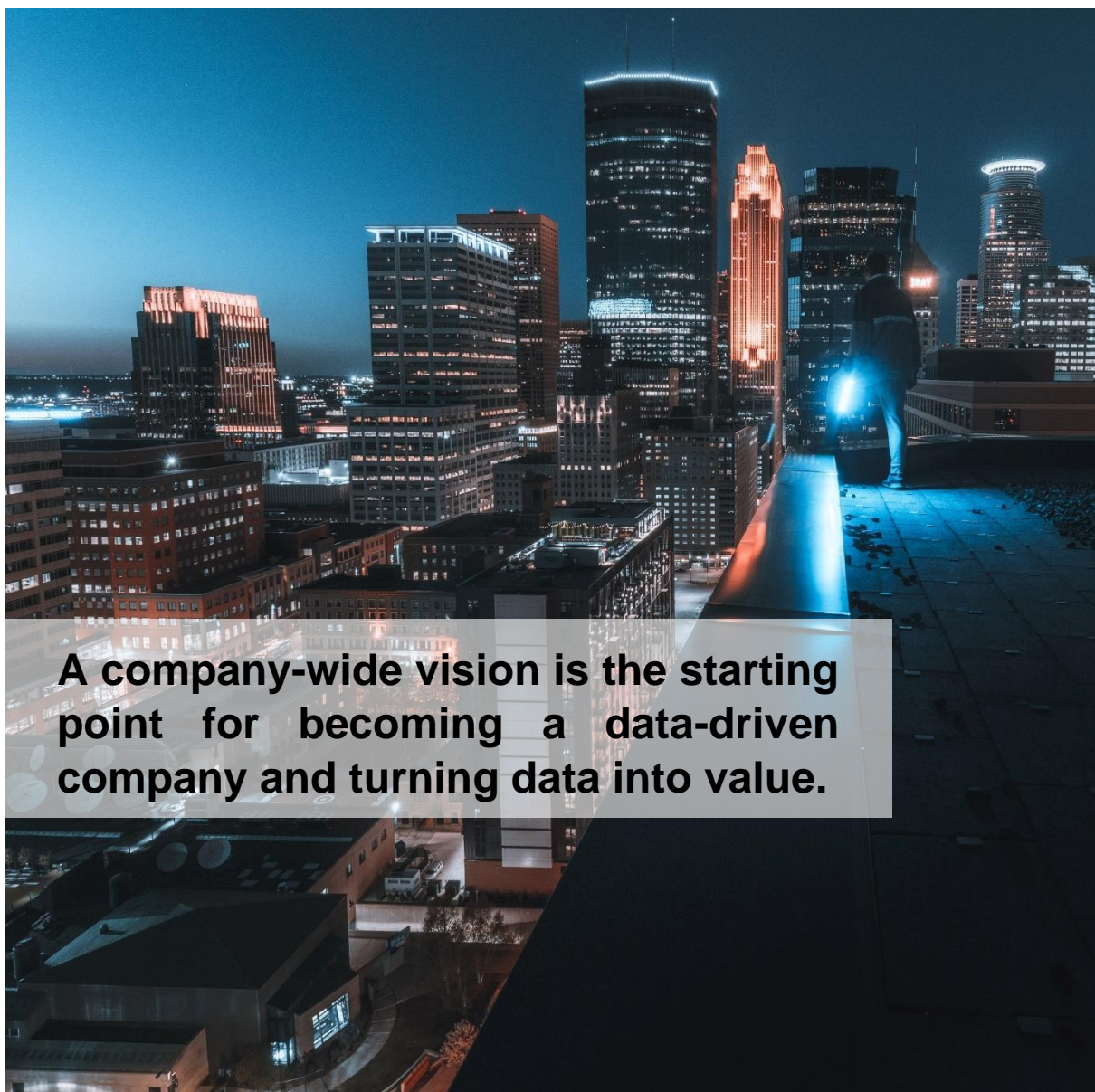
Key Success Factors for Data Transformation

A **company-wide** vision is the starting point for becoming a data-driven company and turning data into value. A clear and compelling vision enables people to understand why changes are necessary:

- What are the challenges with the existing practices?
- What are the benefits of changing?
- How do we reach the target state?

Key success factors for leading the data transformation journey are:

- **People, culture, and competence**
People represent the single biggest challenge and opportunity for the change. Embedded ways of working, habits, mindset, and culture are not easily



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altered. For this reason, an organisation needs to place a strong focus on the organisational change management: instilling the right mindset, focussing on new opportunities, and building up the new required competences.

- **Managing data as a strategic business asset**

Attention should be given to the different perspectives of the data asset such as ownership, governance, data quality, solutions and tools, data usage and delivery, data security and risks, as well as a culture which reflects the mindset and attitude of people towards data.

- **Data operating model**

The data operating model provides an end-to-end basis for managing demand, development, and operations with regards to data. It answers questions like how to steer enterprise data governance and data management, and how to manage the process from the demand of new data development to the delivery and utilisation within daily business.

- **Cross-business data management function**

A central data management function helps business to manage and increase the value of the data by organising data services for design, development, and operations in a professional and cost-efficient manner. This approach supports consistency across the organisation and facilitates data sharing across the different business areas.

- **Focus on critical business data**

While all data needs to be managed, the intensity with which it is managed should be adjusted by the criticality it has for the business. While overall data amounts are exploding, the key to success is to identify which data is the most critical for supporting the company's vision and strategic goals.

Business Benefits

The expected business benefits from becoming a data-driven company extend from operational and process excellence to creating new data-centric products and services. The first realised benefits are usually improved efficiency, lower costs, and reduced risks. Research* identified that organisations can save billions due to increased productivity gained from improving data skills and data literacy among their staff.

Data enables new business models and data monetisation opportunities or brings them within the organisation's reach. Also, other items, such as improved customer experience will have a positive effect on business. Such positive contribution to customer satisfaction will help retain customers and possibly increase the use of offered services.

A Change in the Mindset: Data at the Centre of Business Technology

Data encompasses all perspectives of Business Technology. It is embedded in the business and brings value in each touchpoint from the digital frontline to the technology backbone. It is the foundation of decision making in business.

If we took data out of our processes, operations, and services, everything would simply stop. Everyone must therefore take good care of the core business asset. Data is at the centre of Business Technology.

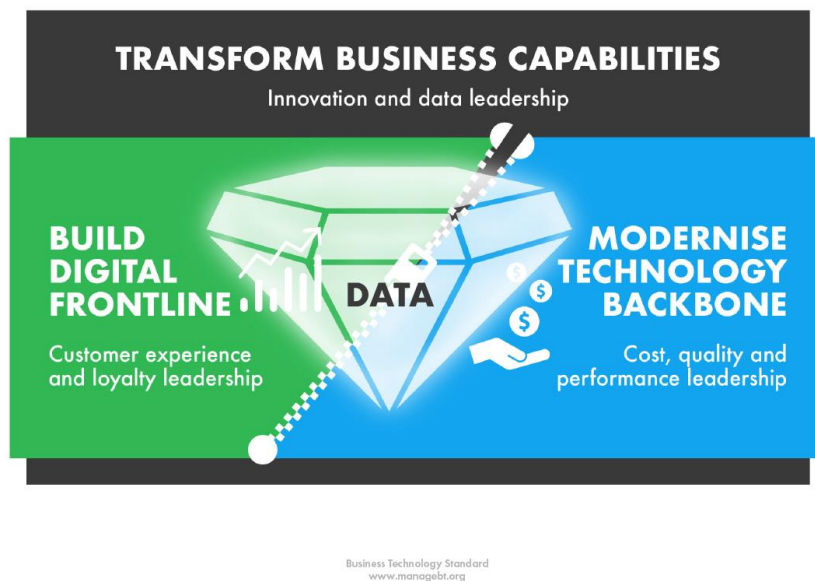


FIGURE 3: DATA AT THE CENTRE OF BUSINESS TECHNOLOGY

Sharing of master data and reference data across the organisation is well understood as being best practice. Now the scope of attention needs to be widened to include all data that could possibly support future business targets. This could extend from IoT sensor data which enables preventive maintenance, all the way to click-streams which reveal customer preference or interests.

All data is a potential strategic asset. A tight cooperation between business and IT will help to identify data sets with potentially high value. In this way a data strategy, which focuses on the data that best supports the corporate vision, can be established. “All Data” is not restricted to internal data, which the organisation already possesses. Complementing internal data with outside data is on the rise. Such external data could be either freely accessible open data, paid data services, or e.g. data from close partnerships or ecosystems.

Data has clearly shifted from an IT necessity providing tool to the business to being a strategic business asset.

Elements of a Data-Driven Organisation

Becoming a data-driven company is a matter for the entire organisation, not only the enterprise data management function. On top of the fundamental triangle of Business, IT and Data, the Figure below illustrates the different crucial elements of a data-driven organisation.

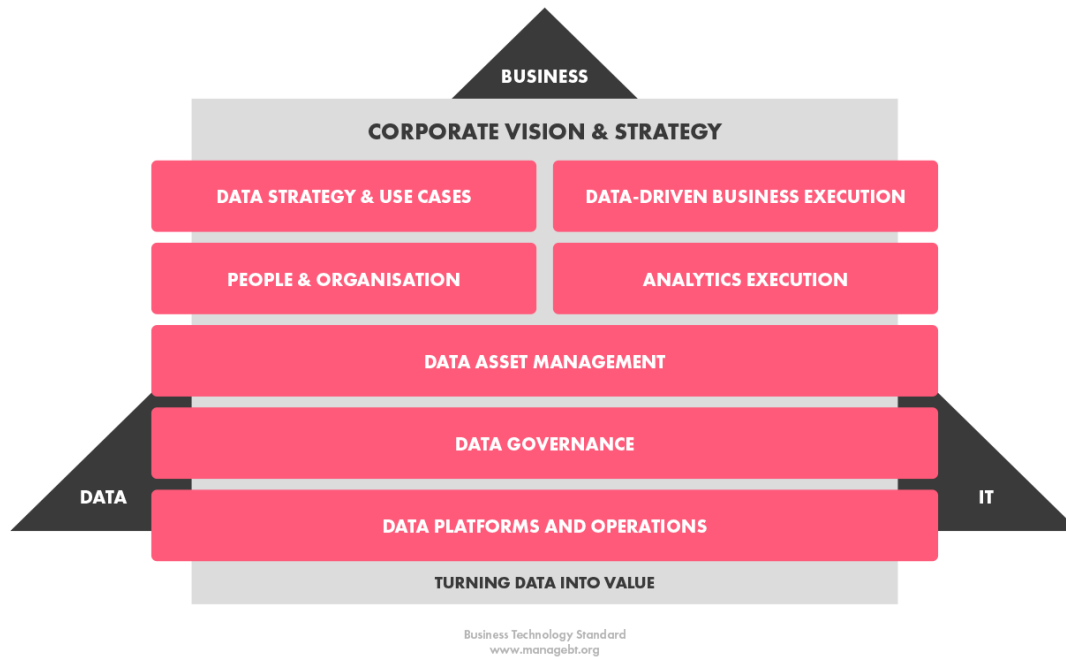


FIGURE 4: ELEMENTS OF A DATA-DRIVEN ORGANISATION

The corporate vision and strategy constitute the starting point for turning data into value. Both provide direction and reasoning for changes which need to take place. The individual elements which distinguish data-driven organisations are:

- **Data strategy and use cases:** Lay down which data is needed in order to support the corporate strategy. How can it be made available and how will it deliver value?
- **Data-driven business execution:** Make decisions based on the facts from data, not on assumptions or gut feeling. Recognise the importance of harmonised data across business solutions.



All data is a potential strategic asset.

- **People and the organisation:** Build and organise data teams and business roles that are equipped with the necessary competences. Change management constitutes the ultimate critical success factor. In addition to change agents, it requires a compelling vision and frequent communication of the goals to engage people in the journey.
- **Analytics execution:** Develop insights, models, and reports that help the organisation in reaching its goals. This can take the form of simply understanding the status quo better and identifying opportunities for improvements all the way up to establishing insights, which enables better and faster decision making.
- **Data asset management:** Define the existing information architecture as well as new data requirements based on the business needs. Avoid duplicate efforts related to data integration and data acquisition.
- **Data governance:** Establish steering, decision making, and monitoring to guide and ensure that data is well-managed. Define clear roles and responsibilities, and see that processes and policies are followed.

- **Data platforms and operations:** Design information flows and systems in a way that ensures business continuity. Aiming for data reusability should be a key theme.

Criticality and Roles of Data in Today's Business

While all data can be viewed as an asset as such, we define three roles data can have based on the business value it generates.

- **Data as a core asset** that has equity value, e.g. product engineering data or install base product information. Organisations have started adding such core data assets either to their balance sheets, or they have created a 'data statement' comparable to a yearly financial statement.
- **Data as a product**, which can be sold, e.g. an insurance company selling aggregated data from processing claims to pharmaceutical companies. Car manufactures are now selling traffic data, which is based on their integrated GPS navigation devices.
- **Data as a necessity**, which can be business critical and therefore holding business value as well.



Critical data has an immediate impact on the organisation's capability or permission to do business. Issues in critical data lead to non-compliance in regulatory, financial, business-critical, or otherwise strategic areas. Neglecting critical data means neglecting business continuity and risking considerable fines.

Critical business data may be identified with the help of four criteria:

1. Regulatory data: Acts as the "licence to do business". Accounting, regulatory reporting and taxation are only a few examples.

2. Business continuity enabling data: Issues in such data endanger business transactions, such as orders, deliveries and billing, and other critical activities such as paying salaries.

3. Data necessary to pursue company strategy: Data content of “must-win battles” and data that enables strategic transformations.

4. Critical reporting data: Data that is used to control business operations and report revenues correctly.

Critical business data should be fully subject to data governance to ensure that it is well managed.



Data Domains

Data can be categorised in different subject areas which are called data domains. Two very common examples of data domains are customer and product. The customer domain includes all data that relate to the customer. Since data domains usually go hand-in-hand with the functional areas inside the organisation, they also serve as the basic structure for assigning data owners and data stewards.

The data owner is accountable for a data domain. The data owner defines high-level data requirements while engaging all the required business lines and areas. Even though the customer data, for example, may have a 'home-base' inside the organisation, it is needed and used across the organisation. Therefore, all business lines and areas should be involved when discussing requirements. The data owner is responsible for setting domain-specific data quality expectations or principles and has the authority to make decisions on the data content. They can also prioritise how data issues are addressed.

Data standards and quality expectations are set per data domain according to the importance and value of the given domain. Similarly, the data life-cycle management is carried out in the data domain context. One important aspect is the retention period, which defines how long the data is kept before it is purged. While for some data it may be beneficial to store it longer, for other data the opposite is true. Due to liability reasons and risks related to data breaches, it is often wise to keep the data life cycle short.

Each data domain includes one or more data asset with multiple data items, each linked with other data items across the company's end-to-end value chain. For each data domain, the seven different perspectives of the data asset diamond (see figure 1) must be attended to.

Data Operating Model

The data operating model is a high-level illustration of how a company can create business value with data. It is based on the Business Technology Standard operating model and highlights the capabilities that are needed for planning, building and running data products and data services.

The capability to design and manage data architecture is often essential. For the planning phase, as an example, it provides visibility to the artefacts that already exist and enable organisations to expand the current data architecture in a consistent and sustainable way.

While the development phase is very much about data modelling and design, data integration and implementing data security, the service phase focuses on providing the correct access to the right people. Access rights govern who may create and update certain data and who can see and use it.

The identified capabilities are then used as the basis for defining the roles that offer these capabilities to the organisation.

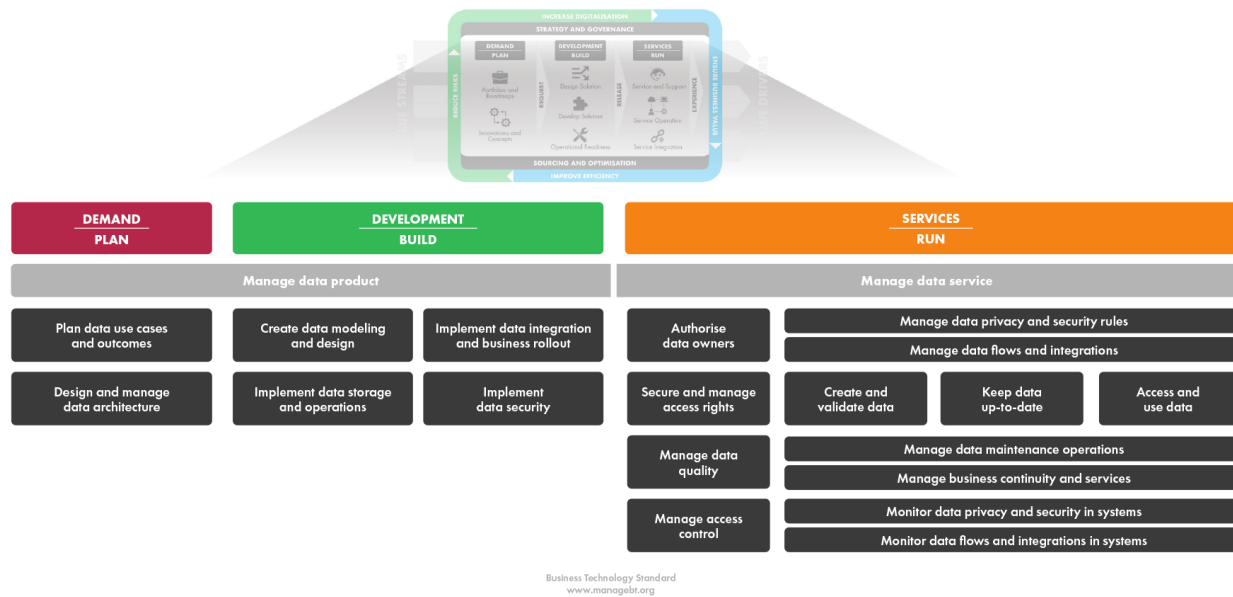


FIGURE 5: OPERATING MODEL AND DATA CAPABILITIES

Data Ownership and Roles

Data is a strategic business asset sponsored at the top executive level. These business executives own the data assets and domains. **Data owners** manage the defined and assigned assets and data elements. They are accountable for planning the data use cases and outcomes and ensure data quality. The use cases could come from anywhere within the organisation. The estimated value of the use case supports the understanding of data being an asset. At the same time, it highlights the importance of data quality.

Data managers and Data experts carry out the necessary hands-on work on the individual data elements and attributes. They are responsible for monitoring and improving data quality as well as executing tasks in accordance with the data governance policies and processes.

Figure 6 depicts the different data roles, which work with the data assets. The roles are distributed over the three areas of business excellence, enterprise development

and service excellence. It is thus important to note that the key data roles should be delivered by teams made from capabilities from across the organisation. An item of data should be recognised and managed in the same manner no matter where it sits in the business value chain.

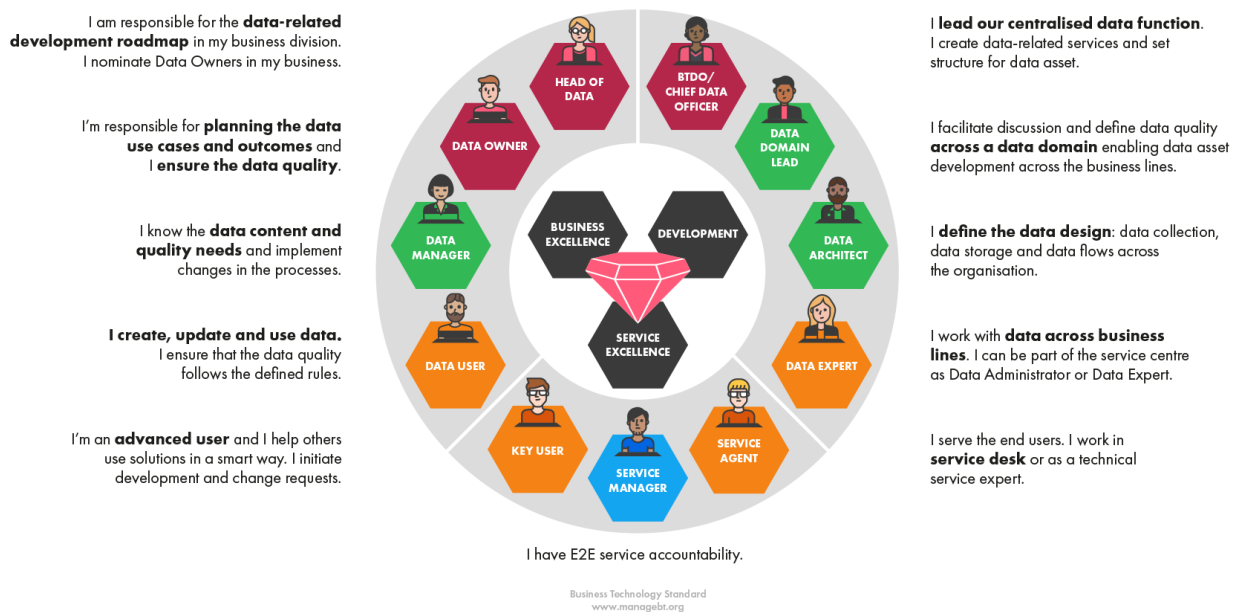


FIGURE 6: DATA ROLES

Data Governance

Data governance provides **guidance and monitoring** to the execution of data management. The corporate vision and strategy provide direction for the data strategy. The data strategy sets the goals for managing data assets and introduces guiding principles on how data should be managed. The organisational setup of data governance provides the decision-making structure including forums, meetings, steering, control, and escalation paths. Clear roles and ownership define accountability and responsibilities.

Policies define processes to be followed, establish standards, and enable control. The two key areas, for which such standards are required, are data architecture and data quality. Well-defined practices ensure that data is managed from the creation and acquisition of data to the use and retainment leading to high data quality. Guidelines and standards on data modelling and database design support meeting the business requirements for data.

One concrete example of such practice is establishing a common language and understanding of the data throughout the organisation. To secure an effective collaboration between technology and business it is essential to speak the same

'language', using the same vocabulary to discuss data and metrics. Such commonly agreed definitions are best maintained and shared in form of a glossary. A **data glossary** should be understood also as a knowledge management tool. It is a central place for storing and sharing valuable information on data coming from various people within the organisation. Besides a clear definition it provides answers to questions like:

- What does the data intend to represent?
- Which business rules apply?
- Which boundaries or limitations exist?
- How is the data altered throughout the life cycle?
- How may or may not the data be used?
- Who owns the data?
- Who is managing the data?

Finally, issue management is to be utilised for identifying, prioritising, and resolving issues related to ownership, policies, standards, compliance, access, and security. Considering that the introduction of data governance and becoming a data-driven organisation will induce changes to the organisation and its people, proactive change management is required to succeed and reach sustainable data governance.

Who We Are

The **Business Technology Forum** (or BT Forum) is a non-profit professional organisation consisting of a community of forerunner companies, and public organisations collaborating according to platform economy model.

The BT Forum provides business and technology leaders with an open-source technology management framework called the Business Technology Standard. The BT Standard consists of best practices, models and tools developed together with the BT Forum community in order to plan, build and run information technology in today's technology-driven business world.

The BT Forum coordinates the development work within the community members and publishes an upgraded version of the BT Standard twice a year. In addition the BT Forum also organises events and conferences, publishes educational materials and offers training courses to advance the business technology management profession.

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