

# Introduction

## INTRODUCTION

Today, intangible assets – which are not physical in nature and include things like data, brand, and intellectual property – have rapidly risen in importance compared to tangible assets such as land, machinery, inventories, and cash. In 2018, intangible assets in the S&P 500 hit a record value of \$21 trillion and made up 84% of all enterprise value. This is a massive increase from just 17% in 1975 (Ali 2020). IDC predicts that by 2023 half of all GDP worldwide will be driven by products and services from digitally transformed enterprises (IDC 2019). Overall, as technology becomes more pervasive with 5G, artificial intelligence, robotics, the internet of things (IoT), quantum computing, analytics, blockchain, and more, organizations are looking at ways to develop, maximize, and protect the value of intangible assets, especially data, as all these digital technologies are underpinned by data.

Against this backdrop, data – an important intangible asset – is considered a critical business resource as it enables organizations to maximize productivity. Today, four of the top five companies in terms of market capitalization are data companies (Investopedia 2022). In 2019, Brian Porter, CEO of Scotiabank, Canada's leading bank, said, "We are in the data and technology business. Our product

happens to be banking, but largely that is delivered through data and technology” (Berman 2016). AIG and Hamilton Insurance Group announced a joint venture firm – Attune, a data and technology platform to harness data and artificial intelligence (AI) capabilities to simplify business processes, trim the amount of time to get insurance, and reduce expenses. Oil field services company Schlumberger captures drilling telemetry data from simulators and sensors to improve drilling performance in oil wells. Moderna’s COVID-19 vaccination success story is attributed to data and analytics (Asay 2021). To summarize, data is a key driver for improved business performance today, and many enterprises across various industry sectors have demonstrated that data is a key enabler for improved business performance with enhanced revenues, reduced costs, and lowered risk.

Basically, the data economy – the ecosystem that enables use of data for business performance – is becoming increasingly embraced worldwide. Data has enabled firms such as Netflix, Facebook, Google, and Uber to acquire a distinct competitive advantage. According to Peter Norvig, Google’s research director, “We don’t have better algorithms than anyone else, we just have more data” (Cleland 2011). In 2021, the market capitalization of Google was more than the GDP of Mexico or Saudi Arabia. Fundamentally, companies that are data-driven demonstrate improved business performance. A report from MIT says that digitally mature firms are 26% more profitable than their peers (MIT 2013). McKinsey Global Institute indicates that data-driven organizations are 23 times more likely to acquire customers, 6 times as likely to retain customers, and 19 times more profitable (Bokman et al. 2014). The industry analyst firm Forrester, found that organizations that use data to derive insights for decision making are almost 3 times more likely to achieve double-digit growth (Eveslon 2020). According to NAIC (National Association of Insurance Commissioners), the implementation of Big Data has resulted in 30% better access to insurance services, 40–70% cost savings, and 60% higher fraud detection rates (NAIC 2021). According to McKinsey & Company, when implemented effectively, data and analytics can yield returns amounting to 30–50 times the investment within a few months in an oil and gas company (McKinsey 2017).

However, most organizations struggle to convert data for improved business performance. There are many reasons for this, and one of the most important is lack of high-quality data. According to Experian Data Quality, a boutique data management company, inaccurate data affects the bottom line of 88% of organizations and impacts up to 12% of revenues (Levy 2015). According to McKinsey, an average user spends two hours a day looking for the right data (Probstein 2019). A report by the *Harvard Business Review* says that just 3% of the data in a business enterprise meets quality standards (Nagle, Redman, and David 2017), and a joint study by IBM and Carnegie Mellon University found that over 90% of the data in a company is unused.

## DATA, ANALYTICS, AI, AND BUSINESS PERFORMANCE



You cannot separate data from AI, and you cannot separate AI from data. The end product of all AI solutions is data and that data will be used again by AI.

Data is the foundation for enabling artificial intelligence (AI) and analytics, and ultimately improved business performance. But what exactly is AI and analytics? Although there is no one universally agreed definition, AI refers to the simulation of human intelligence including cognitive processes by machines, especially computer systems. It is based on the principle that human intelligence can be defined in a way that a machine can easily mimic it, make decisions, and execute tasks, both simple and complex. AI is used extensively across a range of applications today, with varying levels of sophistication from recommendation algorithms in Netflix to Alexa chatbot to self-driving cars to fraud prevention to personalized shopping and more.



Analytics is asking questions to gain insights for decision making. No questions means there is no analytics.

AI generally is undertaken in conjunction with analytics where the analytics algorithms take the data and look to discern useful patterns to facilitate decision making. Basically, AI looks at patterns or predictions about future states using data and analytics algorithms. In other words, pattern recognition and decision making from data are the foundation for AI. If the patterns and decisions are to be reliable, the data should be of high quality. AI is important in business because it can give enterprises insights into their operations.

In some cases, AI can perform tasks even better than humans, particularly when it comes to repetitive and rule-based tasks. In terms of business performance, AI and analytics support three broad and fundamental business needs: automating business processes, gaining insight on business performance through data, and engaging with stakeholders including customers, employees, vendors and other partners associated with the business. To summarize, successful AI relies on patterns, and patterns that are derived from analytics need quality data.

## DATA AS A BUSINESS ASSET OR LIABILITY

While data can be a valuable business asset by offering tangible business results, it has some serious limitations and can become a huge liability if not managed well (Southehal 2021). How can an intangible asset like data become a liability for business? There are four common scenarios where data can become a liability for the business:

1. Collecting data without a defined business purpose will result in huge data volumes, ultimately resulting in increased complexity and cost due to data management. In 2018, according to Deloitte, the average IT spending in a company was 3.3% of the top line and trending upwards at an average of 49% every year. One important reason attributed to these increased IT expenses is the processing of huge data volumes. In addition, if the data is captured without a defined purpose, it will remain unused. Forrester found that up to 73% of data in a company is never used strategically, and research by IBM and Carnegie Mellon University has found that 90% of the data in an organization is unused data or “dark data” (Southehal 2020).
2. Data takes up vast amounts of energy to store, secure, and process, resulting in an increase in the carbon footprint for the business. This makes it less attractive for investors considering their growing interest in ESG (environmental, social, and governance) commitments these days. In 2018, data centers consumed roughly 1% of total global electricity. By 2025, according to Swedish researcher Anders Andrae, the energy consumption of data centers is set to account for 3.2% of the total worldwide carbon emissions and consume 20% of global electricity (Southehal 2020).
3. Cybercriminals are drawn to organizations that have large volumes of data. Many cybercrimes and data breaches in the last few years are associated

with organizations that have large databases. These cybercriminals do not care whether or not the data is dark data, and they acquire all the data they can get their hands on. Following its 2017 data breach, Equifax spent \$1.4 billion on modifying its technology infrastructure.

4. Managing data also entails privacy compliance. As noted in *Fortune*, Facebook lost \$35 billion in market value following the Cambridge Analytica data scandal. In addition, the scandal resulted in the permanent closure of Cambridge Analytica. While it was data that was responsible for the success and growth of Cambridge Analytica, it was the same data that resulted in its collapse and ultimate closure.



Data is a asset only if it is managed well; if not, data is a liability in business. Just capturing and storing data doesn't make an organization data-driven.

Overall, data is a valuable resource and has the potential to become a valuable asset for business enterprises. However, just capturing and storing data does not make data a valuable enterprise asset, nor does it make a company data-driven. Data is a business asset only when it is consciously captured and deliberately managed such that quality data is available to run the business. If data is not managed well, data can become a huge liability that threatens the very existence of the firm.

## DATA GOVERNANCE, DATA MANAGEMENT, AND DATA QUALITY

The preceding sections discussed the importance of managing data for empowering business. But what exactly is data management, and how is it related to data governance? Often in the process of achieving quality data, the terms *data governance*, *data management*, and *data quality* are used interchangeably. Although each of the three domains are different, a company must implement all three of them in order to gain the most value from data.

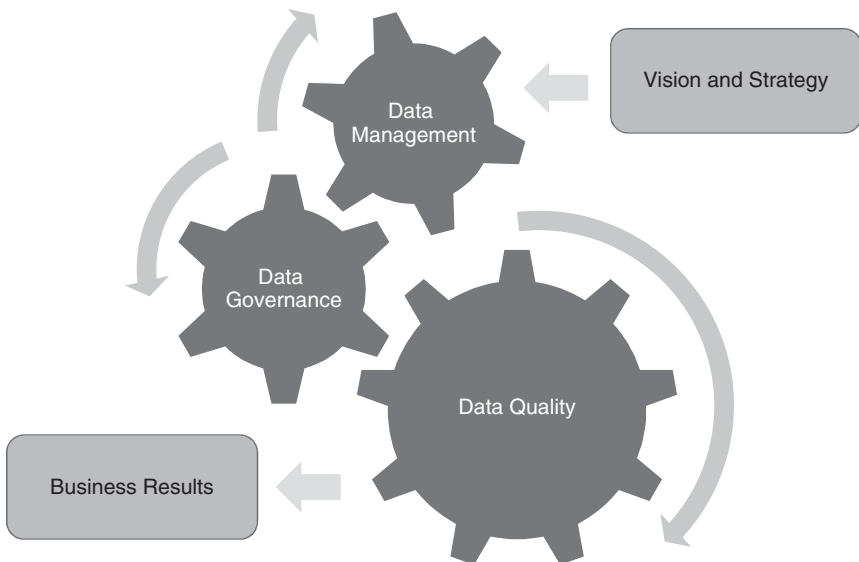
- **Data management** covers principles, practices, programs, systems, and processes a company must undertake to operationalize the data in its lifecycle: that is, from creation to deletion. It is the practice of collecting, keeping, and using data securely, efficiently, and cost-effectively as per the data strategy, of the organization. Gartner says that data management consists of the practices, architectural techniques, and tools for achieving consistent access to, and delivery, of data across the spectrum of data subject areas and data structure types in the enterprise, to meet the data consumption requirements of all applications and business processes (Gartner 2022).
- **Data governance** is a sub-discipline of data management. Data governance comes into play when there is data and that data comes from data management. Data governance is the organizational structures, data owners, policies, rules, process, business terms, and metrics in the end-to-end lifecycle of data. The data lifecycle includes collection, storage, use, protection, archiving, and deletion, and data lifecycle will be covered in detail in Chapter 5. The role of data governance to achieve and sustain quality data will be discussed in detail in Chapter 10.
- So, what are the success criteria of the data governance function? The key criteria of the success for the data governance function are availability of **quality data** for business. Fundamentally, data is considered to be of high quality if the data is fit for use in operations, compliance, and decision making (Southehal 2017).

Basically, data management and data governance work together to improve data quality. For example, the company's business strategy and the data strategy may state that high product quality will come from high data quality attributes of the products and the associated production processes. In achieving this, data management will help the company ensure completeness in the product data attribute, removing inaccuracies and duplications, integrating product data attributes from multiple IT systems and spreadsheets in a single unified view, and so on. In this regard, the company identifies the pertinent IT systems impacted by how the product data is managed and works to achieve high-quality product data.



Business strategy drives data management, and data management drives data governance, and the outcome of the data governance is quality business data.

This effort to enable high-quality product data is a collaborative effort led by the data governance team. Data management will help the company ensure the availability of product master data. The data governance team will work with relevant business stakeholders to define the criteria of quality product data, that is, the IT team who will help in implementing the data integration procedures for unifying product into one single view, the data security team on the data sharing and access control mechanisms, and so on. Overall, the data governance team formulates business rules to maintain and manage the state of quality data. Without the help of data management and data governance teams, organizations cannot trust their data, and therefore cannot guarantee the quality of their data. Business vision and strategy drive data management, and data management drives data governance. The outcome of the data governance function is quality data for improved business results. Figure 1.1 shows the relationship between data management, data governance, and data quality.



**FIGURE 1.1** Data Management, Data Governance, and Data Quality

## LEADERSHIP COMMITMENT TO DATA QUALITY

Most business leaders today understand the role and importance of quality data to fuel business. But they often have other business priorities to focus on, and data-quality initiatives work well only if the business support is available. For example, why should the CRO (chief revenue officer) spend their time improving sales data quality instead of working on training the sales team, forecasting and tracking sales, setting sales goals, and more issues related to leads and increasing sales? Why should the CFO (chief financial officer) worry about data quality instead of spending time on reviewing financial performance of the company? Why should a business leader be concerned about data quality instead of focusing their time and effort on other core business initiatives? What is the impact of data quality in improving business performance? Fundamentally, every business entity has three main objectives:

- Propel growth in revenues and profit
- Reduce operating expenses (OPEX and CAPEX) and cost of goods sold (COGS)
- Mitigate risk and protect the business

Let us first look at the evidences from the field on how quality data enables business growth, that is, enhances the top line – revenue.

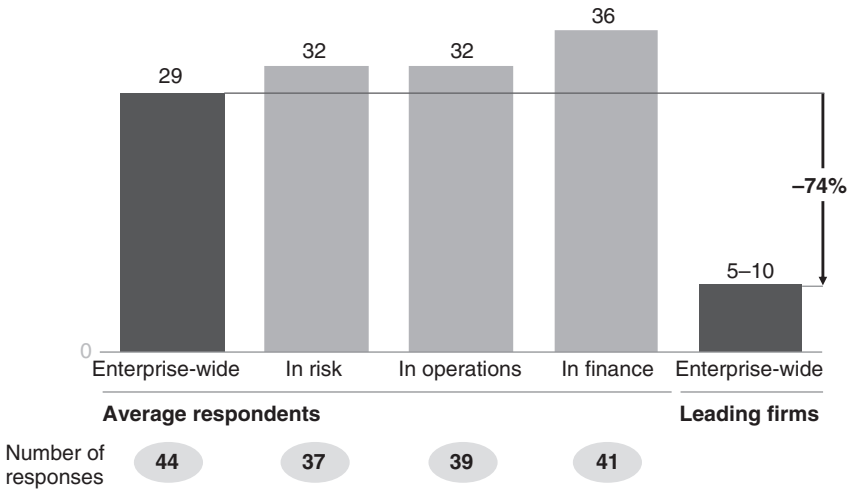
1. A report from CGT (Consumer Goods Technology) says, data and analytics when deployed at scale can generate a 5 to 10% uplift in revenue and up to 6% increase in EBITDA margins (CGT 2021). According to McKinsey, companies that are using data-driven business-to-business (B2B) sales-growth engines report above-market growth, and EBITDA increases in the range of 15 to 25% (Böringer 2022). Basically, high-quality data is essential to achieve business growth.
2. Research reveals that the combination of AI and Big Data technologies can automate almost 80% of all physical or manual work (Forbes 2021). According to a report on “Big Data Use Cases 2015 – Getting Real on Data Monetization,” 40% of the companies leveraging data enjoy a better understanding of consumer behavior (52%), better strategic decisions (69%), and cost reductions (47%). Moreover, the organizations have reported an average of 10% reduction in costs (Tableau 2019)
3. Without data quality, companies not only miss out on data-driven opportunities, they also waste resources and the productivity of employees.



According to McKinsey's 2019 Global Data Transformation Survey, an average of 29% of the total enterprise time was spent on non-value-added tasks because of poor data quality and availability (McKinsey 2020b) shown in Figure 1.2.

**Lack of data quality and availability can cause employees to spend a significant amount of time on non-value-added tasks.**

**Time spent on non-value-added tasks due to poor data quality and availability**  
Estimated % of total employee time



**FIGURE 1.2** 2019 Global Data Transformation Survey of McKinsey

Apart from increasing revenues and reducing expenses, data is also used to protect the business by reducing risk. As businesses increasingly collect more granular data about consumers, regulators need greater insight into what data is available to the industry, how it is being used, and whether it should be used by insurers at all. This means there is a risk in carrying data, and regulatory compliance is essential for running the business. In 2014 Home Depot reportedly paid out at least \$134.5 million to credit card companies and banks as a result of a data breach. In 2021, retail giant Amazon's financial records revealed that officials in Luxembourg issued a \$877 million fine for breaches of the General Data Protection Regulation (GDPR) (Hill 2022). At the same time, regulatory compliance is just not on privacy data. It also applies to data types that concern life and environment. For example, when Nexen, an oil company based in Alberta, Canada, spilled over 31,500 barrels of crude oil in July of

2015, the Alberta Energy Regulator (AER) ordered immediate suspension of 15 pipeline licenses issued to Nexen due to lack of maintenance data records. This means that every business leader needs to know how to collect, store, and protect data in accordance with operational and regulatory mandates to run the business, and this business risk can be prevented only when the data is of high quality.



Improving data quality should be a top priority for all business leaders. Data quality management is an organizational responsibility. This is because good-quality data propels business growth in revenues and profits, reduces expenses (OPEX and CAPEX) and cost of goods sold (COGS), and mitigates risk, thereby protecting the business.

To summarize, low-quality data adversely impacts many areas of business performance from missed opportunities to increased spending to impaired operations, to enhanced risks to poor decision making. But ensuring data quality is not just the responsibility of the IT or the data teams. Improving data quality should be a top priority for everyone in the business if the organization is to survive and grow.

## KEY TAKEAWAYS

So, what did we learn in this chapter? These are the key takeaways.

- Every company today is a data-driven industry as data cuts across the entire business value chain. But unfortunately, firms have been plagued with poor data quality that is affecting their business performance.
- As analytics and AI will have a profound impact on business performance, it is imperative for firms to have good-quality data.
- The terms *data management*, *data governance*, and *data quality* are sometimes used synonymously. But they are three separate disciplines and they need to work together. Quality data is the outcome of solid data governance and data management practices.

- Improving data quality should be a top priority for all business leaders. Data quality management is an organizational responsibility. This is because good-quality data propels business growth in revenues and profit, reduces operating expenses (OPEX) and cost of goods sold (COGS), and mitigates risk.

## CONCLUSION

Today, just capturing and storing data does not make data a valuable enterprise asset, nor does it make a company data-driven. Data is a business asset only when it is consciously captured and deliberately managed such that quality data is available to run and sustain the business. If data is not managed well, it can become a huge liability that can threaten the very existence of the firm. When data is managed well with appropriate data management and data governance practices, there will be high-quality data for AI and analytics. This quality data will power the AI and analytics solutions and offer significant improvements in business performance including increased revenue, reduced expenses, and mitigated risk.

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