La SEI
School of Economic Intelligence
Escuela de Inteligencia Económica
Universidad Autónoma de Madrid

2020

Vol. 2, n 5, pp. 43 - 52
ISSN: 2659-9805
Editor in-Chief: Javier Oubiña

JOURNAL OF ECONOMIC & BUSINESS INTELLIGENCE

Universidad Autónoma de Madrid UAM

WE, OF THAT TIME, ARE NO LONGER THE SAME: LEADING CULTURAL CHANGE IN DATA MANAGEMENT AND GOVERNANCE

Raúl Cruces Rufo*

Abstract

The world has changed so much that communication between people and organizations is now controlled by information technology (IT). The flow of data per minute or second is simply immense. Our relationship with customers evolves. For example, in bank industry branches have ceased to be the physical meeting space for managers and customers. Market leadership is no longer determined by the density of the branch's physical network. In fact, new players who neither are bankers nor have ever had a branch to grant loans or process insurances have emerged in the banking scenario. And they are trying to mix with banks at the same level. Customers manage today their own agenda. They communicate with us through their smart devices. We have entered the digital age and those who best understand, process and use the data derived from our clients' digital interaction will be the leaders of the coming decades. We have entered the age of knowledge, of the client. The greater and higher quality the information we have about their activities and needs, the closer we will be to maintaining our privileged position as a reference entity. One does not play with data. One progresses and strengthens their ability to respond immediately to clients and markets. Welcome to data management and governance based on the search for excellence in terms of knowledge, treatment and quality of information, a basic pillar of our strategy. Welcome to our future, which is already here.

Key words: data management, data governance, strategic three years data plan, data management and governance pillars and elements, excellence, customers, regulation, efficiency increase, complexity reduction, data driven company enablement, business continuity, Chief Data Officer (CDO), CDO function market trends, transformational leader, business enabler and analytics, data-driven organization enabler, heliocentric theory, adapt to the new environment, breaking silos, common way of understanding, adaptation of IT, business needs, transparency, trust on data.

* Data Group Vice-president and Group Senior Data Manager in Banco Santander

1. Data management and governance

"It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of light, it was the season of darkness, it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us, we were all going direct to Heaven, we were all going direct the other way—in short, the period was so far like the present period, that some of its noisiest authorities insisted on its being received, for good or for evil, in the superlative degree of comparison only". Perhaps Charles Dickens was thinking in data management and governance (see Figure 1) when he wrote "A tale of two cities".

Figure 1: *Data Management and Data Governance*

Data governance is how we decide to manage. It is about planning and defining the model for working, establishing the governance and ensuring its implementation. Data management is organizing and doing the work. It deals with identification of needs, execution of tasks as well as control and monitor according to the framework established in data governance.

Data governance never replaces but complements data management. It comes into play when individual managers find that they cannot – or should not – make independent decisions. Data management and governance bring together cross-functional teams to make interdependent rules, to resolve issues, or to provide services to data stakeholders. Data governance can be considered the overall process of making this work. The tasks to be performed, both in data management and data governance, must answer to six key questions: Why? What? Who and whom? For what? How? When and where? (see Table 1)

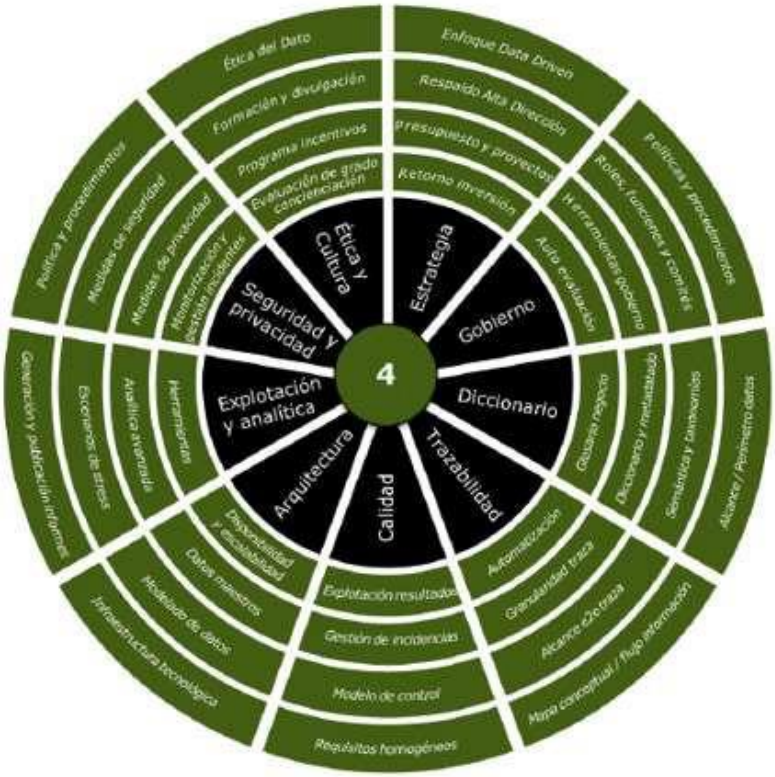
Table 1: *Processes and tasks in Data governance and Data management*

		Data governance	Data management
Task		**Establish policies, rules, procedures, methodologies, strategies and oversight**	**Focus on the data granularity, how it relates with other data, monitoring and controls**
1	*Whay*	Define and follow a common strategy in the resolution of needs.	Identify needs: business, regulatory and corporate
2	*What*	Setting up a data map and data classification.	Identify, define and classify data.
3	*Who and whom*	Define the governance model / governing bodies.	Identify stakeholders and their functions regarding its management.
4	*For what*	Classification and criticality criteria.	Identify uses and classification of data.
5	*How*	Define policies, standards and methodologies.	Define systems / architecture / processes (capture, storage, transformation, removal, lineage, quality)
6	*Whe and where*	Establish procedures and define repeatable processes. Train management and staff to adopt common approaches to data issues.	Implement and materialize how.

The efficient transformation into a Data Driven company requires the definition of a strategic three years' data plan that is aligned with the organization's business and IT strategy, as well as the preparation, execution and monitoring of a roadmap, that prioritizes initiatives by necessity, cost and benefit, also taking into account possible synergies and dependencies between them.

To cope with it, both, data management and governance must comprise each and every one of the elements that are contemplated within the pillars that support it (see next figure 2):

Figure 2: *Chart for coping with data management and governance*



1. Data strategy: data driven focus, top management support, budget and return on investment
2. Data governance: policies and procedures, roles, functions and governing bodies, data management and governance tools and data self-assessment
3. Data dictionary: data catalog, data ontology and taxonomies, data dictionary and metadata and business glossary
4. Data traceability and lineage: data map, data flow, scope, granularity and automation
5. Data quality: homogenous requirements, control model, remediation plans and reporting generation and exploitation, stress test, advance analytics and data analytics tools
6. Data architecture: IT infrastructure, data modelling, master data, availability and scalability
7. Data exploitation and analytics: reporting generation and exploitation
8. Data security and privacy: policies and procedures, security measures, privacy measures, issues monitoring and management
9. Data ethic and culture: data ethic, training and capacitation, incentives program and degree of awareness assessment
10. Data Oversight: over all elements that are contemplated within the nine pillars

It is recommended to review the data strategy and associated roadmap on an annual basis in order to ensure its alignment with the new needs of the organization, and if appropriate, update them. Likewise, it is also recommended to identify indicators of success for each of the initiatives to be deployed that make it possible to monitor its proper implementation.

2. Why excellence in data management and governance matters?

Now that we know what data management and governance is, let's understand why excellence when executing it is important for companies. In the past data have been considered a liability, so managed through a sort of operational or industrial processes in factories, but now they are a source of competitive advantage, making feasible to get benefits in four hey aspects:

Compliance with regulation. Regulators are strengthening regulatory pressure such as BCBS 239 (RDA), Markets in Financial Instruments Directive (MIFID II), Fundamental Review of the Trading Book (FRTB), European Commission Directive on Payment Services (PSD2), General Data

Protection Regulation (GDPR) and Cyber-security related regulations are pushing companies to report more information, more frequently and with more granularity. A best in class data management and governance program produces significant benefits mitigating risks (including reputational risk) and avoiding sanctions and fines.

Efficiency increase. As per integration and processing of data from various sources, using them in a consistent way while improving their quality continuously. Also through the enablement of process streamlining, machine learning and industrialized reporting. Benefits are cost reduction by IT and resources synergies and process improvement.

Complexity reduction. Data increases transparency and creates an integrated understanding of the company. Also right and homogeneous information available to the entire organization and flexible and scalable architecture allowing interconnected systems. Benefits are organizational and process improvement, increased transparency, cost reduction and increased data quality.

Data driven company enablement. Advanced analytics provide insightful information for better decision-making (i.e. fraud reduction). There is an increase in speed to insight to reduce time to market. Finally, it enables data-based value added services (data accessibility, data quality, data classification and fit for purpose governance). Benefits are additional revenues from existing or new businesses as well as better service to customers and offer personalization.

3. Good data management and governance ensures business continuity

Human beings have always been characterized by their search for progress and well-being and, if possible, wealth. It is intrinsic to our human nature.

The Romans decided to extend their vast empire in search of all those goods that they considered of immense value to them. Trade was the engine that led to the economy of the late Republic and early Empire, through important trade exchanges with Carthage and negotiating with China and India, through the Silk Road and the Indian Ocean.

Christopher Columbus obtained the patronage of the Catholic Monarchs by convincing them of the riches that would bring from the West Indies, which led to the Spanish obtaining in their American territories a fabulous amount of gold and silver, which sustained the hegemony of the Habsburg dynasty in Europe and contributed to the birth of a global economy[2].

In the middle of 20th century Americans and Soviets fought for twenty years for the conquest of space in the so-called space race, with the aim of mastering communications around the Earth, measuring data on climate, vegetation and human movements, leading electronics, remote measurement, vehicle control and robotic control and, above all, the arms race.

Oil, the black gold, has become the world's most important source of energy since the mid-1950s. Its products underpin modern society, mainly supplying energy to power industry, heat homes and provide fuel for vehicles and aero planes to carry goods and people all over the world. USA, Saudi Arabia and Russia are the top three oil producing countries, controlling more than 40% share of world total. The top ten controls the 71%. In the 21st century everyone talks about data.

Algorithms, data analytics, data mining, artificial intelligence, cognitive robots are the bases to become a true data-driven company. Data emerges as the new black gold. However, no one mentions data management and governance. A cross piece that acts as the super glue of the rest of the data related areas, being the real foundations for being a data-driven company. You can have the most sophisticated algorithms, the best data analysts, the finest data miners, the best cognitive robots. All this will have no value if your data are not quality enough. Good data management and governance ensures adequate data quality and therefore business continuity business continuity.

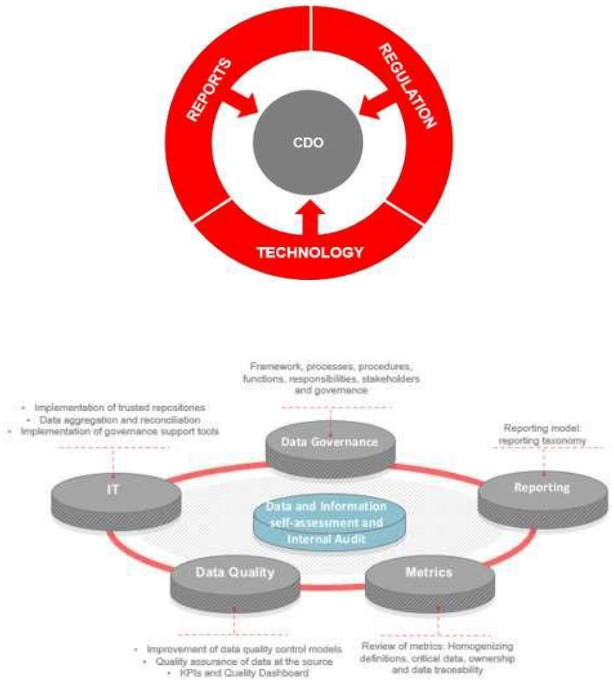
4. The Chief Data Officer

So far I have explained what data management and governance is, why excellence when executing it is important for companies and have asserted that a good data management and governance ensures adequate data quality and therefore business continuity business continuity.

But what is the role within the organization leading a data management and governance program? The answer is simple, the Chief Data Officer (CDO) (See Figure 3)

[1] Manuel Lucena Giraldo: History of Spain - The silver of America: the wealth that sustained the Spanish monarchy (https://historia.nationalgeographic.com.es/a/plata-america-riqueza-que-sustento-a-monarquia-espanola_7696)

Figure 3: *The role of Chief Data Officer (CDO)*



The inception of the data management and governance function in the financial industry, performed and led by the CDO was due to new risk data aggregation and risk reporting framework principles (BCBS 239), issued for the financial sector industry by the European Central Bank, implying improvements in data governance, reporting, metrics, data quality and technological infrastructure. On top of that, the data and information self-assessment process must measure periodically the degree of compliance.

However, the world is changing. Communication between people and between them and companies are not the same as those of the past. IT leads communications. Millions of data are transferred per minute around the world (see Figure 4)

Particularly the banking industry is facing four great challenges: i) the main channel is changing very quickly. Bank branch moving to multi-channel, meaning increase of interactions on digital channels; ii) personalized knowledge by person-to-person contact has changed into personalized knowledge by data analysis; iii) the leader was the one who had the best bank managers now the leader is the one who has more and better data and iv) our competitors were other financial entities with the same regulatory requirements. However new major competitors are emerging from other sectors, without the same regulatory requirements.

These major challenges leads to a necessary evolution of the CDO function market trends, from a transformational leader in 2014 and 2015 to a business enabler and analytics from 2016 to today. However, this is not the end of the trip, as the critical goals is to become a data-driven organization enabler in the near future

CDO role emerged to provide appropriate data management throughout the whole company. Core functions performed include data controls and governance, quality and metadata. Regulation and compliance act as big levers of pressure to create the CDO role (particularly in the financial industry the role is given due operational execution of BCBS 239). CDO role is focused mainly on implementing foundational technologies.

Figure 4: *World and banking industry changes*

From 2016 on CDO role starts to take ownership of additional responsibilities, starting to deliver tangible business value through advanced analytics, both by creating centers of expertise and addressing analytics problems. Well-established data strategy is focused on delivering prioritized use cases, supported by a multi-year roadmap. There is a material progress in implementing a strategic data architecture

based on golden sources, simplification and new technologies as well as the enablement of process optimization. Also, the focus is on a fully implemented operating model and data controls across critical elements and reports, enabling transparency and increased data quality.

But this is not the end of the trip. What about the future? CDO must become a Data-driven organization enabler. The need of a continued emphasis on the role as a strategic business enabler is required as data becomes a valuable asset for the company and a source of competitive advantage, being treated like that at a company board level, enabling data monetization, full end-to-end process optimization and cost reduction. CDO must drive a data driven organization, which means: i) data culture embedded across the board for all decision- making processes, ii) use of advanced analytics to solve complex problems, as well as for the long tail of day-to-day problems and iii) robust technological platform to effectively manage and exploit data.

5. Heliocentric theory, can we learn from the history?

In 16th century, Nicolas Copernicus (1473-1543), a genius well ahead of his time, defended the heliocentric theory. He affirms, "The Earth moves around the Sun". His theory of the universe placed the Sun rather than Earth at the center of the universe. Nobody believed him. The most important leaders of Protestantism (Luther, Calvin, and Melanchton) objected to it because it contradicted what the Scriptures affirmed.

Shortly after, in 17th century, Galileo Galilei (1564-1642) comes up with the telescope in 1609, throwing a new scientific method showing that Copernicus was not wrong. Everybody said he was crazy. He was even brought to trial during the Inquisition and ends up sentenced to live under house arrest until his death for defending his ideas. Centuries later, their theories are accepted by everyone and the world perspective and the scientific method as well.

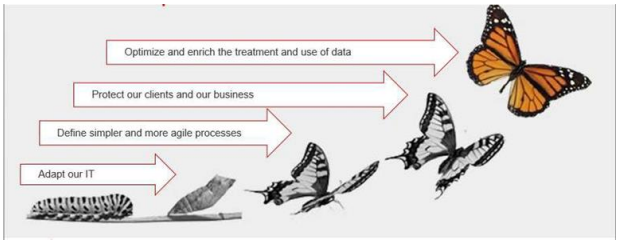
In the 21st century, we are looking for new "Suns". Can we learn from their history? What was the initial failure? Threefold: i) they did not have their leaders support (senior executives), ii) they met with opposition to change, to make the world looks different, iii) their colleagues showed their resistance to change the work method from a traditional to a scientific one.

What if data were stars? How would we get the organization to change the way of seeing data and make the stars to be an inspiration in the search of new worlds? How can we manage to set our Sun (our customers) in the center of the System? Should we consider that there is only one Sun or that there are other Suns?

6. How to adapt to the new environment?

The adaptation to the new challenging environment requires to cope with four key topics: i) adapt our IT, setting consumers at the center of decisions, ii) define simpler and more agile processes, iii) protect our customers and our business and iv) optimize and enrich the treatment and use of data (see Figure 5)

Figure 5: *The adaptation to new environment requires*



5.1. Adapt our IT: consumers at the center of decisions

On October 2017 Stephanie Condon in ZDNet[3] informs that Campbell Soup announced its objective to undergone a digital transformation aiming to use e-commerce, science, analytics and supply chain optimization to grow sales. The aimed e-commerce strategy was to build around four specific objectives:

1. Scaling digital marketing capabilities. This involved investing in the creation and distribution of brand and product-specific content at more and more customer journey points, supported by a revised marketing technology infrastructure built around building and maintaining consumer relationships. The third component was an increased focus on data analytics with a view to understand better the behaviors of Campbell's consumers.
2. Creating an integrated e-commerce approach. That means pulling digital marketing, sales, supply chain and e-commerce activities under one umbrella and having a unified worldview.

[3] https://www.zdnet.com/article/campbell-soup-hires-new-chief-technology-and-information-officer/

3. Driving digital and e-commerce innovation. To be achieved through the creation of an in- house Accelerator Unit with a "tech company mindset and a test-and-learn culture". As well as assisting Campbell's to scale its own digital capabilities and develop cross-portfolio e-commerce solutions, this Accelerator arm would also be charged with finding and incubating new business models and revenues streams across the Campbell's estate.
4. Developing a new supply chain model. This means to underpin online commerce and has the flexibility to support new channels and partners.

Over the summer, the company announced its new North American e-commerce unit, stating its intention of generating $ 300 million in e-commerce sales over the next five years.

As part of their strategic reorganization aiming to better position the company to capitalize on the rapidly changing food industry landscape, while more closely aligning the business with the company's three growth strategies (optimize the value of the core; increase health and well-being food, beverages and snacks; and, accelerate distribution and new business models) Campbell soup hired a new CT&IO with a proven track record of converting digital complexity into strategy, announcing that technology was one of the keys to help differentiate Campbell in a rapidly evolving food industry.

The role, reporting to the senior vice president of integrated global services, is in charge of global information technology and building a world-class IT function that delivers value to the business, the company. His relentless focus is driving IT innovation and creation of new employee, customer and consumer experiences designed to fuel growth.

Campbell's business case illustrates perfectly how the companies must adapt their IT, setting consumers at the center of decisions. Business sets the company strategy and challenges IT to adapt to it, not the other way around.

5.2. Define simpler and more agile processes

On March 2016 Andrew Meola informs in Business Insider[4] that e-commerce retailers were losing their customers because of this critical mistake. US on-line shoppers were abandon their carts during the payment phase on both desktop and on-line platform. Four of the five top reasons were bailing out of the checkout process stem from the logistic of entering information through desktop or mobile. 46% occur at the payment stage; 37% at checkout logging; 21% when the users need to enter their billing address and 20% when they need to enter their shipping or delivery address. E-commerce retailers were coming up short with regard to the checkout process. US consumers had little to no desire to manually enter all of their information. Amazon's click ordering, for example, allows a shopper to use their saved payment and shipping information to literally make a purchase with one click on a button. E-commerce retailers must adapt their approach in order to avoid leaving potentially billions of dollars on the table; most of it is easily recoverable with a few tweaks to the checkout process.

Similar situation happens in airlines. Are you a frequent flyer? I am. Why do I need to manually enter all of my personal and travelling information in the check-in process? They have all my data. Why I am requested to fill in all fields in blank when they can be prefilled?

We need to think carefully in our customers' needs. They request us the fastest and simpler processes when they deal with our companies.

5.3. Protect our customers and our business

An example about a divorce mistake as per staying financially connected illustrates perfectly this topic. A US subsidiary of one of the world largest bank deployed an integration of several customer platforms. They agreed on the criteria to select the address when the same customer was in more than one, deciding to keep the one of the most important platform. They executed the agreed algorithm for the integration. One customer was in two platforms. In one of them, he had his home utilities bills, his sons' school bills or his wife's expenses, among others. In the other one he had also some utilities bills but from other apartment different to his family home where other woman expenses were charged. The customer started to receive mails of both homes leading his wife to file a divorce lawsuit. He obviously sued the bank.

The bank planned the strategy and the algorithm worked fine. However, they did not carefully think about a critical aspect affecting the customers, causing serious damages to them but also to the bank itself.

Any decision we plan must always be executed after careful analysis of the implications it has for our clients, since these will also affect our company.

In this fashion, it also very noteworthy that when we design a research and development plan, if the researches are successful, they must go through two governing bodies, one that is responsible for assessing how they can impact on our current customers and another that values ethical aspects,

[4] https://www.businessinsider.com/e-commerce-shoppers-abandon-carts-at-payment-stage-2016-3?IR=T

such as compliance with data privacy or data protection regulations or issues that may affect communities.

Ethical governance must be part of the data governance. This must be articulated through a governing body in which Marketing and Legal take part, collaborating with the Data Council

5.4. Optimize and enrich the treatment and use of data

On December 2015 The Guardian[5] reported Real Madrid have been thrown out of the Copa del Rey for fielding an ineligible player, Denis Cheryshev, but the Russia international should have been suspended after he received three yellow cards for Villarreal in the competition previous season. Cheryshev was withdrawn from the action moments after half-time, when Real Madrid had realized their error, with the head coach saying they wanted to "show good faith" (see figure 6).

Figure 6: *Real Madrid and the "Copa del Rey"*

The Real Madrid president, Florentino Pérez, said the club would fight any sanctions for playing Cheryshev against Cadiz. He believed that as neither the player nor the club were informed of the suspension that Real Madrid cannot therefore be disqualified from the Copa del Rey. "The one-match ban for three yellow cards in our view is not effective because no one has notified the player as specified in the disciplinary code of the Royal Spanish Football Federation (RFEF). Earlier, Cheryshev confirmed he did not receive notification from his former club that he would be banned ("I did not receive any notification from Villarreal to inform me that I had been banned from playing in the Copa del Rey").

The RFEF confirmed the decision on Friday afternoon, with the federation's competition committee judge ruling to eject Real from the tournament and fining them €6,001. "Cheryshev was ineligible to play, so the tie is resolved in favor of Cadiz," said the RFEF in a statement.

This example illustrates perfectly why the optimization and enrichment the treatment and use of data in very important. If all the Spanish football clubs and the RFEF would have shared a single data repository the notification from Cheryshev's former club about him to be banned would not be needed, therefore not alleged by the Real Madrid president as a cause to avoid the sanction.

Building bridges to simplify citizens' procedures. For instance, in UK, there are different data repositories for council tax, electoral registration form, National Health Service, application for a driving license or Her Majesty Revenue and Customs. The same happens in Spain and in many other countries. Why not a single one for all of them.

6. Keep balance between two dimensions: Client and Regulations

As previously mentioned, Data management and governance function was founded in the financial industry in 2013, in an environment clearly marked by regulation and emphasis on the need to comply with the new risk data aggregation and risk reporting framework principles issued for the financial sector industry by the European Central Bank.

Accordingly, banks created data management and governance functions with two main objectives: to position themselves as the best banking institution providing positive customer service and support, and to comply with the new regulations enforced in response to the 2008 financial crisis. This means to keep balance between two dimensions: clients and regulation (see Figure 7)

On a weighing pan of the scale platform are increasingly demanding customers looking for uniqueness and multichannel experience, leading companies' urgency to know their behavior patterns and needs. On the other side of the scale, more demanding regulatory environment in terms of

[5] https://www.theguardian.com/football/2015/dec/04/real-madrid-copa-del-rey-caz

additional regulatory information, data quality, data protection and confidentiality and portability and open data.

Figure 7: *The balance between Client and Regulation*

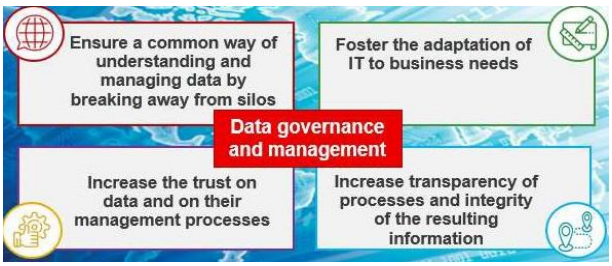
The appearance of new regulations linked to personal data, such as data protection (e.g. GDPR General Data Protection Regulation in the European Union or Lei Geral de Proteção de Dados in Brazil), data privacy (e.g., California Consumer Privacy Act) or information security (NIS Directive on security of network and information systems in the European Union) represent both a great challenge, as well as a great opportunity to achieve a competitive advantage within the sector.

Therefore, having precise and quality data for the development of analytical models to help maintain and take care of our current customers, as well as to attract new ones, is fundamental for us.

7. How can data governance and management help?

In an environment where data becomes our best tool, proper data governance and management is a key instrument as i) ensure a common way of understanding and managing data by breaking away from silos, ii) foster the adaptation of IT to business needs, iii) increase transparency of processes and integrity of the resulting information, and iv) increase the trust on data and on their management processes (see figure 8).

Figure 8: *Helps from governance and management data*



Ensure a common way of understanding and managing data by breaking away from silos. Setting common rules of the game for the use and processing of data as well as promulgating a common data language. A regulatory framework that determines policies and procedures, roles and functions, a committee structure for data management decision-making and a common language that reduces ambiguity and facilitates understanding by classifying data.

Foster the adaptation of IT to business needs. Data architecture is the link between business needs and IT solutions to the extent that it aligns data processing with the use and destination of the data. Business set requirements and needs through data classification (ontology and taxonomies) Data architecture defines, depending on the purpose of the business, which is the best way to relate the data, which should be their flow and their best sources. IT functional and technical architecture defines and provide the technological solutions supporting the alignment of the defined data architecture and the identified business needs.

Increase transparency of processes and integrity of the resulting information. Aimed to provide an easy identification and status of data throughout their lifecycle by means of identifying the data on every moment of their lifecycle (traceability and lineage), disclosing the status of data quality and the processes that support it and, finally, providing a global view of the data and their treatment so it expands the knowledge. All this through appropriate data management and governance tools that make the information available to the entire organization, as well as to regulators and supervisors. Also, escalating data issues to the specified committees at different levels where all stakeholders are represented.

Increase the trust on data and on their management processes. By means of proactive management of data quality and data treatment processes. It is a must the assessment of the data quality and its treatment processes because of common standards and methodologies, to improve its use and treatment, monitoring both of them, identifying plans for continuous improvement.

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