

Data Governance to Be a Data-Driven Organization

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Keywords: Data Governance, Data-Driven Organization, Data Governance Challenges, Data-Driven Challenges, Data Governance Culture, Data-Driven Culture.

Abstract: Many organizations have been trying to become data-driven which their business decisions, their relationships with customers / suppliers, the innovation of their products / services, the improvement in their performance and their growth are based on the collection and analysis of an increasing volume of data. To reach this level, organizations need to overcome a series of challenges related to the way they govern data and creating a data-driven culture. The main challenges to be overcome are directly related to data culture and the culture of the organization itself. This paper presents the results of a survey performed among 67 professionals with experience in Data Governance (DG) in which was possible to identify the main challenges to establish a DG program and data-driven culture in organizations, besides priority actions to face these challenges. The challenges and necessary actions to implement a DG program are shown and discussed. Addressing these challenges is fundamental to raising the organization culture and maturity in DG and, consequently, becoming a Data-driven organization.

1 INTRODUCTION

Data-driven Culture (DDC) is interpreted as a pattern of behaviors and practices by a group of people who share a belief that having, understanding, using data and information plays a crucial role in the success of their organizations (Chaudhuri et al., 2024).

DDC represents a specific form of organizational culture that is realized through data orientation. A DDC emphasizes that organizational decisions are grounded on insights from data, which fosters continuous knowledge and skills acquisition within the organization. Organizational culture encompasses a collection of values, beliefs, and attitudes held by organizational members. As it is based on organizational cultures, DDC's complexity lies in its need for consistency with decision-making principles (Fattah, 2024).

Becoming data-driven is about building capabilities, tools and most important a culture that is acting


on data (Anderson, 2015).


In DDC data must be shared across the organization. DDC focus on setting goals, measuring success, interaction, feedback, learning and recognition of Data Literacy (DL) (Anderson, 2015).


Becoming data-driven is stated as one of the top priorities for organizations for the last 10 years. Numbers show clearly benefits of being data-driven. Companies that base their decisions on evidence are on average 5% more productive and 6% more profitable than their competitors (Storm and Borgman, 2020).

DDC influences business models and provides ways through which organizations develop their operations to secure higher profits (Chaudhuri et al., 2024).

Efficient and fast analysis of huge volumes of data has helped organizations make accurate decisions which could help influence innovative activities. Such an approach has also helped organizations revamp their business processes and develop smart products in relation to customer needs, eventually leading to increased profitability. Thus, the improvement of the organizational data-driven culture could lead employees to be more creative and gen-

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erate novel ideas that could lead to the creation of new products to cater to the needs of dynamic markets (Chaudhuri et al., 2024).

Data Governance (DG) is the comprehensive management of usability, availability, Data Privacy and Security (DPS) and Data Quality (DQ) inside and outside the organization (Abraham et al., 2019).

It includes establishing policies, standards, processes, and structures to ensure the correct use and effective protection of data (Al-Dossari and Sumaili, 2021).

DG requires policy specification dynamics that can deal with problems related to the collection, storage, processing, sharing and use, reuse, and disposal of data throughout its life cycle (Filgueiras and Lui, 2022).

Many businesses are currently adapting digital strategies and new business models. Studies have shown that organizations of all sizes recognize the need for DG (Lis and Otto, 2020). Increasing importance has been given to incorporating DG as a means of encouraging the strategic use of data, thus promoting data-driven innovation (Lis et al., 2022).

The data-driven innovative capabilities have been enhanced by the applications of advanced Information and Communication Technology (ICT), strong analytic capabilities, effective data management and governance mechanisms (Chatterjee et al., 2024).

Beyond this, DG serves as a structured framework for organizations to manage data, recognizing data as a valuable corporate asset, thus promoting the optimal use of data. In practical terms, by organizing and mapping data-related processes within organizations, DG enables organizations to identify which data should be analyzed, unlock potential value, and overcome obstacles in developing DDC (Fattah, 2024).

DG plays a crucial role in encouraging and empowering the use of data analysis, such as DL, aligned with DDC. In this context, DG establishes decision making rights and accountability to ensure appropriate behavior in assessing, creating, using, and controlling organizational data, analytics, and information assets. Integrating DG with the overall business strategy and aligning it with data and analytical assets is considered critical for the organization's stakeholders (Fattah, 2024).

The findings indicate that DG and DL originally precede DDC. Consequently, it delivers a relevant theoretical contribution by providing empirical evidence and delving into the role of DG as a precursor to DDC. Interestingly, despite DG's crucial role in overseeing data pertinent to organizational decision-making, existing literature lacks clarity concerning the nomological network between DG constructs and

other analytical capacities (Fattah, 2024).

This article consists of identifying that an organization will become data-driven when it creates a real DDC, and this will be possible through the implementation of effective DG.

2 CHALLENGES

2.1 Data-Driven Culture

DDC helps organizations to support process and product innovation eventually impacting the performance of the organizations (Chaudhuri et al., 2024).

Culture permeates every aspect of organizational actions, influencing decisions related to products, employees, customers, measurements, resource allocation, etc. While some leaders seek to embrace cultural norms using advanced technology, others may resist cultural change (Fattah, 2024).

There is necessity for shift the executive mindset by stimulating DDC and formulating strategies and mechanisms for governance (DG), as well as renewing the skills of analysts (DL) (Fattah, 2024).

Study conducted to identify the enabling factors of a DDC identified that (Berndtsson et al., 2018):

- established DG and access to data of good quality are mandatory for any type of analysis. If these features are not in place, then trust in business insights generated by various tools will deteriorate and undermine the move towards a DDC.
- top level management is important and needs to be actively involved in developing a strategy for establishing a DDC.

A survey conducted to identify challenges to creating a DDC pointed out the following (Storm and Borgman, 2020):

- a big challenge is taking away resistance to adopt a new technology.
- the struggle of creating insights derived from analysis.
- the complicated organizational structure.
- the lack of time forms a barrier among employees.
- the lack of knowledge occurs in departments where data is not originally embedded.

2.2 Data Governance

Organizations face challenges and problems in implementing a comprehensive and efficient DG program. In many cases, there is a lack of knowledge on the part

of the professionals involved in conducting DG implementation projects, regarding which activities are necessary, who should be responsible for carrying out these activities, what the relationship and dependence are between these activities, as well as the impacts generated by not performing such activities properly (Bassi and Alves-Souza, 2023).

Several studies have found, among other reasons, that many of the bad decisions are due to the poor quality of the information generated from dirty, erroneous and incomplete data. This has led important companies worldwide to lose many thousands of dollars by managing information of low quality in their organization (Castillo et al., 2017).

Companies spend an average of 30% of their time on non-value-added tasks due to poor DQ and availability (Zhang et al., 2022). Key trends in DG indicate that by 2025, 80% of organizations seeking to scale digital businesses may fail if they do not adopt a modern approach to DG and analytics (Fattah, 2024).

Implementing DG is a complex project that requires long-term commitment and continuous engagement and, as such, organizations usually need to formulate a series of actions towards these goals (Zhang et al., 2022).

Mobilizing an organization to adopt DG has proven to be a challenge in practice. Taking stock of data inventory remains tedious, the potential for value creation seems abstract, and the importance of investing in DG is understood only if the company has already suffered major regulatory pressure or data breaches (Benfeldt et al., 2020).

There is a general lack for a clear understanding of what DG is and how it is currently implemented in companies (Krumay and Rueckel, 2020).

A comprehensive review of the scientific and practice-oriented literature shows a lack of understanding the activities required for introducing a DG program (Alhassan et al., 2019).

The implementation of a DG program implies a set of actions as presented by the Data Management Framework (Association, 2017) and Data Governance Institute (DGI) DG Framework (Thomas, 2024), highlighting the need to carry out:

- an inventory of assets, business processes, regulations regarding data processed by the organization.
- the constitution of a governance management committee.
- creating consistent and effective policies.
- the training of all employees in DG concepts, technologies and best practices and the creation of a data culture.

3 RESEARCH

Within the scope of a research to specify a guide with practical and coordinated actions that help organizations in the implementation of DG, a survey was carried out among professionals with experience in DG in two stages, the first through a web form and the second through an interview.

3.1 First Stage

A web form was created based on the challenges, impacts and solutions in the implementation of DG obtained from a literature review [reference - (Bassi and Alves-Souza, 2023)] to help evaluate the following points:

- validate that organizations carry out a series of actions in the context of implementing DG, among them, the mapping / survey / inventory of data, processes, regulations, and infrastructure; the creation and performance of a Management Committee; the development and application of DG, DPS and DQ policies, in addition to presentation / training in the concepts of DG and the policies.
- identify the importance, level of complexity and priority of such actions in DG.
- identify the main challenges that prevent organizations from carrying out such actions.
- identify the main challenges faced by organizations when carrying out such actions.

Table 1 in the *APPENDIX* displays the web form used in this stage.

It was estimated that a population of 81 research participants could represent at least organizations of different sizes (small, medium and large), in different stages of implementation (initial, advanced and planning) and in different market segments.

It is important to determine the size of a sample to represent the population of a research. According to Krejcie and Morgan, the recommended sample size would be around 82% of this population (Krejcie, 1970).

200 professionals who work with DG were invited to fill out a web form. 67 professionals answered the form and signed the consent form to participate in the research.

They have been working on the implementation of DG in organizations from the most different market segments and of the most varied sizes as show in Figure 1, Figure 2, and Figure 3.

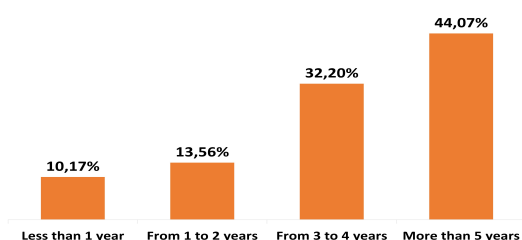


Figure 1: Experience in DG.

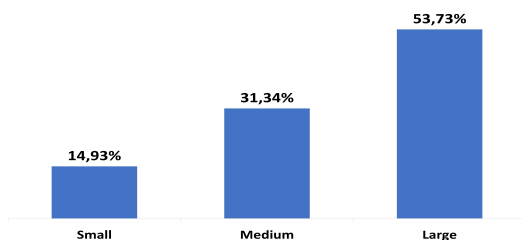


Figure 2: Size of the organization.

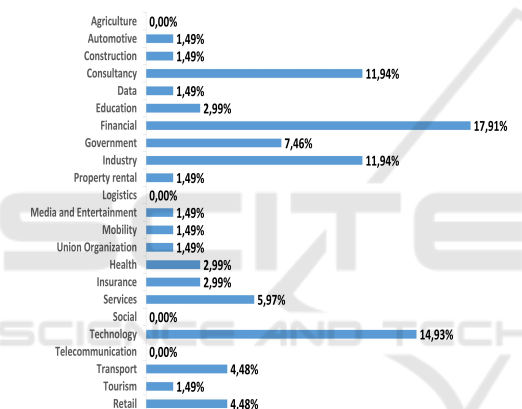


Figure 3: Organization's market segment.

3.2 Second Stage

38 professionals from the group who responded to the web form and who had more than two years of experience in DG were invited to participate in the interview phase (75% of the participating professionals had more than 3 years of experience in DG).

19 professionals agreed to participate in this second phase. A web form based on the results collected in the previous stage was designed to conduct an on-line interview, whose objective was to obtain a classification / prioritization of the main challenges identified at the first stage to that prevent from carrying out the actions and faced when carrying out the actions in order to help in prioritizing these actions in the implementation of the DG.

Table 2 in the APPENDIX displays the web form used in this stage.

4 ANALYSIS

Among the various challenges highlighted by professionals during the first phase of the research, it was possible to identify that the challenges listed below are directly related to cultural and organizational aspects that impact the implementation of effective DG and alignment with the organization's strategic objectives:

Resistance (RST) - professionals' reluctance to adopt new processes, policies, procedures, and tools due to concerns about changes in organizational culture, the perception of loss of control or impact on the activities performed or, the lack of awareness / training.

Employee Engagement (EEG) – active and motivated participation of employees in the process of understanding, adopting, executing, and effectively using practices, policies, procedures, and tools in their activities.

Culture / Knowledge / Empowerment (CKE) – forming a data-driven mindset, promoting understanding and effective use of practices and procedures through training and ongoing education.

Experience (EXP) - practical knowledge and in-depth understanding of practices, procedures, and tools by the organization's professionals.

Alignment / Communication (ALC) - ensure all stakeholders are coordinated and informed about policies, procedures, and objectives to promote effective collaboration and successful implementation.

Perception of Value / Benefits (PVB) – everyone involved recognizes the potential positive impacts, encouraging support, adherence and commitment to the initiatives are being implemented.

Management Support (MSP) – demonstration of leadership, commitment, and strategic direction to ensure adequate resources, organizational alignment and prioritization of initiatives are being implemented by the organization's executives.

4.1 Mapping / Survey / Inventory Challenges

The implementation of a DG program implies the need to know the data from the organization, the business processes that manipulate this data, the regulations, and standards that they must be followed and the infrastructure that supports the processing of the data.

To achieve this, the following actions are necessary:

Data Inventory (DI) - comprehensive identification, cataloging and documentation of all data that the or-

ganization collects, processes and stores, with the aim of understanding how that data is used, who has access to it and where the data is stored.

Process Mapping (PM) - identify, visualize, and document in detail all business processes, aiming to understand how data flows through the organization and identify points of intervention.

Regulatory Survey (RS) - identify and analyze relevant laws, regulations, internal policies, and external standards that impact data management, security, and privacy, ensuring legal compliance and risk mitigation.

Infrastructure Mapping (IM) - identify and document the structure of hardware, software, and data storage systems, ensuring a comprehensive understanding of the technological infrastructure that supports the management and manipulation of organizational data.

Figure 4 presents the ‘Challenges that Prevent from Carrying Out’ and the ‘Challenges Faced when Carrying Out’ the Mapping / Survey / Inventory (MSI). The x-axis of the figures shows the number of citations of the challenge by participants.

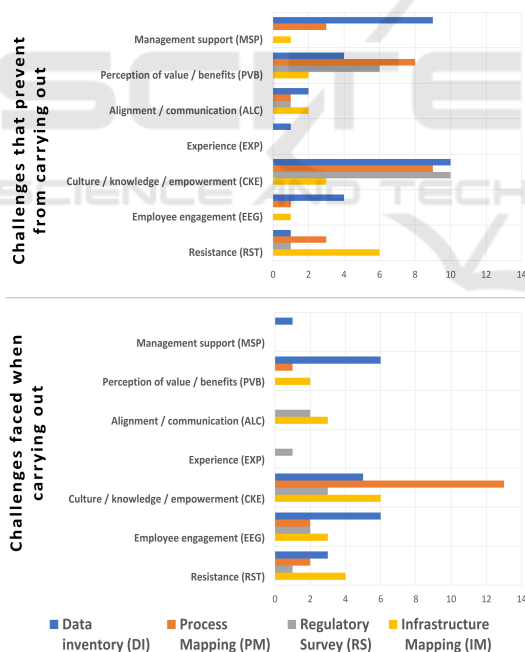


Figure 4: Challenges to carry out the mapping / survey / inventory (MSI).

The MSP, PVB and CKE are challenges that practically impact the carrying out of these actions as indicated by some research participants.

[P54] - “Culture of the organization, people trained to implement the process and mainly lack of support from the organization’s leadership.”

[P66] - “The lack of technical knowledge about process mapping is one of the main challenges, due to the complexity of the processes and the level of maturity of the processes. Another point is not knowing what benefits this mapping will bring to the company objectively.”

The challenges CKE, EEG and RST impact the execution of these actions.

[P75] – “Engagement of the organization to map concepts and metadata, size of the current Data Governance structure and understanding of the importance of the subject by board members.”

[P01] – “Resistance and commitment of those responsible.”

When professionals were asked to classify / prioritize the most relevant ‘Challenges that Prevent from Carrying Out’ and the ‘Challenges Faced when Carrying Out’ for these actions, the following ranking was obtained as shown in the Figure 5.

The challenges MSP and the PVB are the main ‘Challenges that Prevent from Carrying Out’ and ‘Challenges Faced when Carrying Out’ in the execution of an MSI.

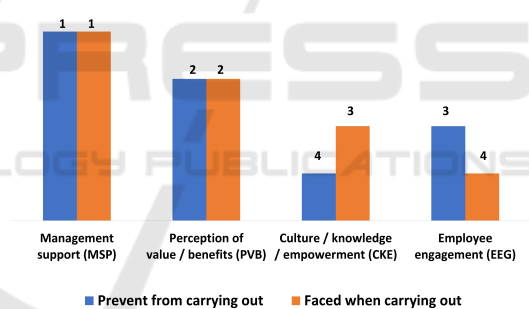


Figure 5: Ranking of challenges to carry out the mapping / survey / inventory (MSI).

4.2 Management Committee Challenges

The creation and effective performance of a management committee will have a significant impact on the implementation of DG.

The Data Office establishes vision, strategy and governance of initiatives, projects, actions of the council data, ensures the smooth functioning and management of data systems, guarantees ethic, responsibility, and lawful use of data. It consists of a multidisciplinary team, as well as an information and records manager and experts in efficiency, transparency, accountability, and life cycle management (Cerrillo-Martínez and Casadesús-De-mingo, 2021).

Figure 6 presents the ‘Challenges that Prevent in the Creation’ and the ‘Challenges Faced when in the

Performance' of the Management Committee (MC). The x-axis of the figures shows the number of citations of the challenge by participants.

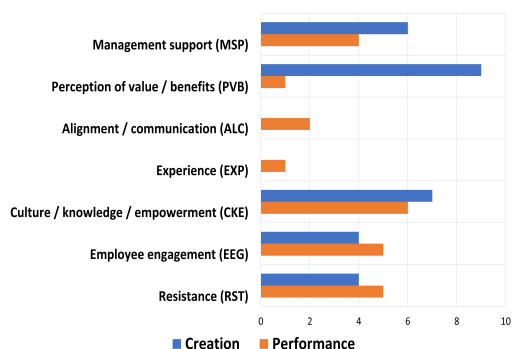


Figure 6: Challenges that prevent in the creation and faced when in the performance of the Management Committee (MC).

The MSP, PVB and CKE are challenges that practically impact in the creation of the MC while the challenges CKE, EEG and RST impact the performance of the MC.

[P68] – “The lack of a data governance culture in the organization, which recognizes the strategic importance of data as an asset and a resource for decision making.”

[P55] – “Management of conflicts of interest related to corporate vs departmental prioritization, lack of knowledge and experience, as well as resistance to change.”

Figure 7 presents the classification / prioritization carried out by professionals of the ‘Challenges that Prevent in the Creation’ and the ‘Challenges Faced when in the Performance’ of the MC.

The creation of the MC is impacted by the challenges MSP and PVB while your performance is impacted by the challenges PVB and CKE.

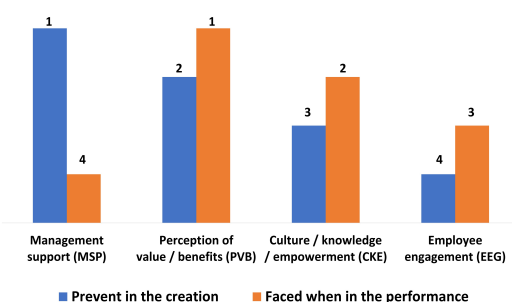


Figure 7: Ranking of challenges in the creation and faced when in the performance of the Management Committee (MC).

4.3 Policy Challenges

Companies specify guidelines and rules for the creation, acquisition, storage, security, quality and permitted use of data, developing standard processes and policies for data, and establishing employee organizations that support dedicated data governance activities (Zhang et al., 2022).

The following policies are relevant within the DG program:

Data Governance Policy (DGP) – set of principles, guidelines and procedures formally established to guide the management, quality, security, privacy, and ethical use of data, aligned with the organization strategic and regulatory objectives.

Privacy and Data Security Policy (PSP) – set of formal guidelines that establish the requirements and procedures to protect the confidentiality, integrity, and availability of data, ensuring compliance with privacy and security regulations, such as the General Data Protection Regulation (GDPR) - European Community and the Lei Geral de Proteção de Dados Pessoais (LGPD) - Brazil, and mitigating risks related to data breaches.

Data Quality Policy (DQP) – set of guidelines that defines standards, processes, responsibilities to ensure the reliability, accuracy, integrity of data throughout its life cycle, aiming to effectively support operations and decision making.

Figure 8 presents the ‘Challenges that Prevent the Developing and Application’ and the ‘Challenges Faced when Applying’ these policies. The x-axis of the figures shows the number of citations of the challenge by participants.

The challenges MSP, CKE and EEG are CPDA of the policies while the application of the policies is impacted by the challenges PVB, ALC, CKE and EEG.

[P27] – “The preparation of data owners and data stewards to carry out their role within data quality.”

[P31] – “The company’s culture does not favor the practical application of a Data Governance policy.”

[P35] – “Changing behavior and adopting a policy is always delicate and if it is not done correctly, all the work may have been in vain.”

Figure 9 presents the classification / prioritization carried out by professionals of the ‘Challenges that Prevent the Developing and Application’ and ‘Challenges Faced when Applying’ of the policies.

The challenges MSP, PVB and CKE impact on the developing and application of the policies.

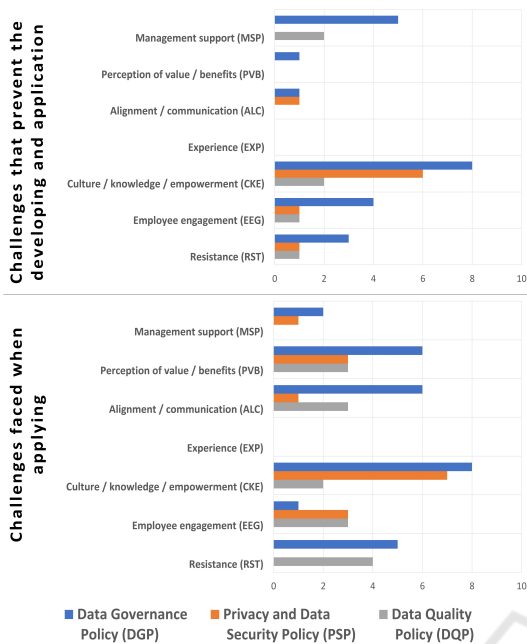


Figure 8: Challenges to develop and apply the policies.

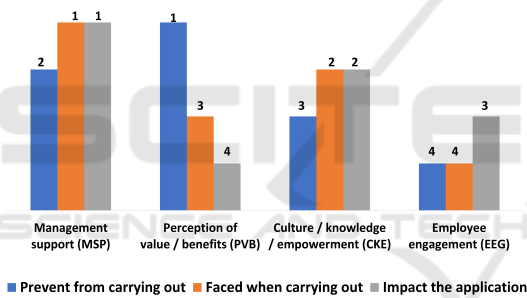


Figure 9: Ranking of challenges that prevent the developing and applying and in the application of the policies.

4.4 Presentation / Training Challenges

Different actions / interactions are recommended to ensure appropriate employee data competencies. The most important action / interaction is ‘training’, such as continuous training in dealing with and implementing data policies as well as data processes and procedures and includes internal and external training (Alhassan et al., 2019)

Figure 10 presents the ‘Challenges that Prevent from Carrying Out’ and the ‘Challenges Faced when Carrying Out’ the presentation / training (PT) on the concepts involved in DG and the elaborate policies. The x-axis of the figures shows the number of citations of the challenge by participants.

The MSP, PSB and CKE and employee engagement are challenges that impact the carrying out of these actions.

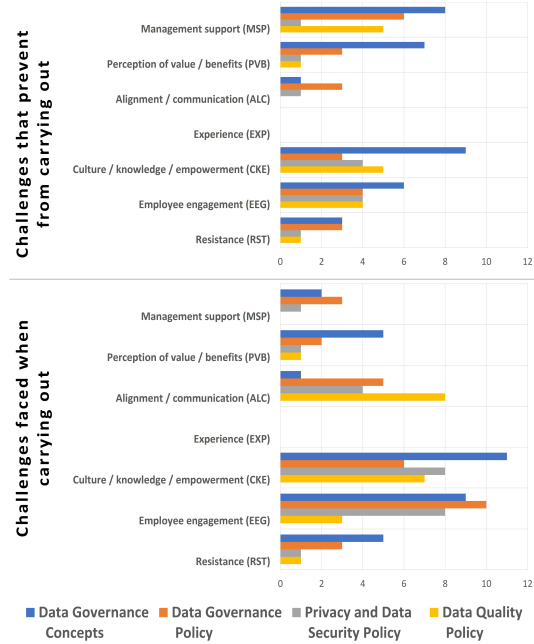


Figure 10: Challenges to carry out the presentation / training (PT).

[P31] – “Include the training agenda in a broader literacy program with a focus on governance themes associated with business challenges.”

[P46] – “The clear definition of a data strategy for the entire institution from the organization’s management team and not from the information technology area.”

The execution of these actions is impacted by the challenges ALC, CKE and RST.

[P45] – “Employees who do not participate in training, not all managers are concerned with Data Governance.”

[P68] – “Measuring and demonstrating the benefits and results of the Data Governance Policy, which demonstrate improvements in the quality, security, privacy and value of data.”

Figure 11 presents the classification / prioritization carried out by professionals of the ‘Challenges that Prevent from Carrying Out’ and the ‘Challenges Faced when Carrying Out’ for the PT.

The challenges MSP and CKE are the main ‘Challenges that Prevent from Carrying Out’ while the EEG and PVB are the ‘Challenges Faced when Carrying Out’ for the PT.

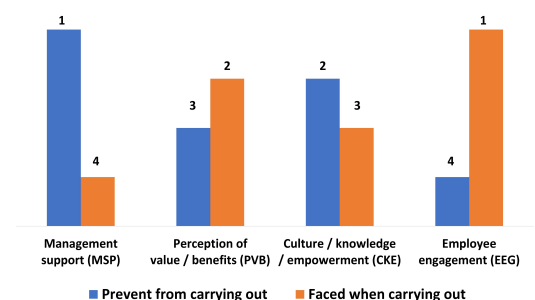


Figure 11: Ranking of challenges to carry out the presentation / training (PT).

5 DISCUSSION

It can be identified that cultural aspects are extremely relevant to the successful implementation of a DG program in organizations. These aspects comprehend a set of values, beliefs and behaviors that define how the organization conducts its business and how it treats its customers and partners (Bassi and Alves-Souza, 2023).

A Scoping Review (SR) of publications that present case studies (CS) on DG projects identified that the challenges related to cultural aspects like the lack of perception of the value of data as an asset and the lack of understanding and training of those involved in the concepts, technologies and best practices have significantly impact on the implementation of DG in organizations from different market segments and countries (Bassi and Alves-Souza, 2023).

The importance of incorporating DG as means of encouraging the strategic utilization of data, therefore promoting innovation and culture, is increasing (Lis et al., 2022).

One of the solutions identified in the literature for implementing DG is train and improve DL for all staff across organizations that participate in the project (Kawtrakul et al., 2021).

Implementing DG is a complex project that requires long-term commitment and continuous engagement and, as such, organizations usually need to formulate a series of actions towards these goals (Zhang et al., 2022).

A DDC should be developed, engaging the entire business, and sparking employee interest and motivation. DDC must be extended in an integrated way throughout the organization, instead of being segregated (Anton et al., 2023).

Data-driven organizations require strong, top-down data leadership. They need a leadership that inspires, promotes a data-driven culture, and actively drives and supports all aspects of the analytics value chain, from data collection through to data-driven de-

cision making and institutional learning (Anderson, 2015).

Establishing clear policies for DG helps ensure the responsible and ethical use of data within the organization (Anton et al., 2023).

The implementation of a DG will effectively contribute to making an organization data-driven. It turns out that implementing a DG program involves overcoming a series of cultural and organizational challenges.

In the research performed with professionals who work in DG, it was possible to identify the four main challenges directly related to cultural and organizational aspects that prevent or impact the carrying out of the actions necessary to implement the DG program as shown in the Figure 12.

Previous knowledge of these challenges helps organizations that desire to implement effective governance of their data to better plan and take the necessary actions to mitigate the impacts that these challenges generate (Bassi and Alves-Souza, 2023)

The successful implementation of a DG program will create a DDC and, consequently, make the organization data-driven.

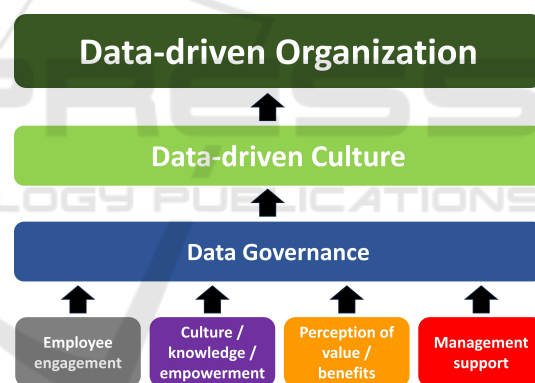


Figure 12: Cultural challenges of a Data Governance.

6 CONCLUSIONS

Many organizations are on the path to becoming data-driven. It turns out that there are a series of challenges that must be overcome in how they manage their data so that they can enjoy the benefits that data orientation offers.

The main challenges to be overcome are related to data culture and the culture of the organization itself. Management support will be fundamental in all actions involved in implementing a DG program.

The perception of value and benefits that data has and that its governance offers enhances the creation of this data-driven culture.

Management support and the perception of value / benefits will have a direct impact on employee engagement in all actions necessary to implement data governance and culture.

Carrying out training, awareness, and engagement of all employees in the concepts and activities involved with data governance, the policies, the procedures, and methodologies necessary to perform all necessary actions will facilitate the perception of value / benefits for everyone in the organization, facilitating the allocating of financial resources and human needed.

The research conducted with professionals allowed us to obtain details related to the challenges in implementing DG. In addition to the cultural and organizational challenges discussed in this paper, there is information related to data, organizational structure, technology support, policies and DG implementation projects that will be explored in other papers.

Many of the results presented here were used to validate the specification of a guide with practical and coordinated actions that help organizations in the implementation of DG, overcoming the main challenges, evolving in their maturity and, thus, creating a culture to obtain the desired benefits to be a data-driven organization. This guide will be presented in another article as soon as the research is completed.

Implementing the actions specified in this guide in some organizations will allow us to assess how much the implementation of DG contributes to creating a data-driven culture and, consequently, making these organizations data-driven in contrast to organizations that have not implemented DG.

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APPENDIX

Table 1: Web form used at the First Stage of research.

Begin of the Table 1		
Question	Alternatives	
1	OBJECTIVES	
2	IDENTIFICATION OF THE RESEARCH PARTICIPANT	
2.1	Do you have experience in DG?	Yes No
2.2	If you have experience in DG, indicate the approximate time.	Less than 01 year 01 to 02 years 03 to 04 years More than 05 years
3	ORGANIZATION IDENTIFICATION	
3.1	Size	Small Medium Large
3.2	Market segment	Agriculture Consulting Education Financial Government Industry Logistics Health Insurance Services Social Technology Telecommunications Transportation Other
4	STAGE IN DATA GOVERNANCE	
4.1	How would you classify the organization's stage of DG?	Planning Under implementation Implemented Not planning to implement
4.2	How long has the organization been implementing DG?	Not applicable 06 months 01 year 02 years More than 02 years
4.3	What are the main factors that motivate or motivated the organization to implement DG?	Assist in decision-making Improve data quality Gain competitive advantage Reduce data management costs Comply with legislation/regulations Increase data security Reduce data volume Improve access to data Other
5	DATA INVENTORY (DI)	
5.1	Regarding the organization's carrying out of DI?	Performed Is currently being performed Intends to perform Will not perform
5.2	How important is it to conduct a DI for DG?	Not at all important Slightly important Moderately important Very important Extremely important
5.3	What level of priority should be given to DI?	No priority Low priority Neutral High priority Maximum priority
5.4	What is the level of complexity for performing DI?	No complexity Low complexity Moderate complexity High complexity Extreme complexity
5.5	List the main challenges that prevent the organization from carrying out the DI	
5.6	List the main challenges faced by the organization when carrying out the DI	
6	PROCESS MAPPING (PM)	
6.1	Regarding the organization's carrying out of PM?	Performed Is currently being performed Intends to perform Will not perform

Continuation of the Table 1		
Question	Alternatives	
6.2	How important is it for DG to PM?	Not at all important Slightly important Moderately important Very important Extremely important
6.3	What level of priority should be given to PM?	No priority Low priority Neutral High priority Maximum priority
6.4	What is the level of complexity involved in PM?	No complexity Low complexity Moderate complexity High complexity Extreme complexity
6.5	List the main challenges that prevent the organization from carrying out PM	
6.6	List the main challenges faced by the organization when carrying out PM	
7	REGULATION SURVEY (RS)	
7.1	Regarding the organization's carrying out of RS?	Performed Is currently being performed Intends to perform Will not perform
7.2	How important is it to conduct RS for DG?	Not at all important Slightly important Moderately important Very important Extremely important
7.3	What level of priority should be given to the RS?	No priority Low priority Neutral High priority Maximum priority
7.4	What is the level of complexity in conducting a RS?	No complexity Low complexity Moderate complexity High complexity Extreme complexity
7.5	List the main challenges that prevent the organization from conducting a RS	
7.6	List the main challenges faced by the organization when conducting a RS	
8	INFRASTRUCTURE MAPPING (IM)	
8.1	Regarding the organization's carrying out of IM?	Performed Is currently being performed Intends to perform Will not perform
8.2	How important is it to perform IM for DG?	Not at all important Slightly important Moderately important Very important Extremely important
8.3	What level of priority should be given to IM?	No priority Low priority Neutral High priority Maximum priority
8.4	What is the level of complexity in performing IM?	No complexity Low complexity Moderate complexity High complexity Extreme complexity
8.5	List the main challenges that prevent the organization from performing IM	
8.6	List the main challenges faced by the organization when performing IM	
9	MANAGEMENT COMMITTEE (MC)	
9.1	Regarding the definition / performance of a DG MC in the organization?	Existing and active committee Committee in the process of being created Intends to establish a Committee Does not intend to establish a Committee
9.2	How important is it to establish a DG MC?	Not at all important Slightly important Moderately important Very important Extremely important
9.3	What level of priority should be given to the creation of a DG MC?	No priority Low priority Neutral High priority Maximum priority
9.4	What is the level of complexity in defining a DG MC?	No complexity Low complexity Moderate complexity High complexity Extreme complexity
9.5	What is the level of complexity in the performance of a DG MC?	No complexity Low complexity Moderate complexity High complexity Extreme complexity
9.6	List the main challenges that prevent the creation of a DG MC	
9.7	List the main challenges encountered in the performance of the DG MC	

Continuation of the Table 1		
	Question	Alternatives
10	DATA GOVERNANCE TRAINING	
10.1	Regarding the presentation of DG concepts to the organization's employees?	Performed Is currently being performed Intends to perform Will not perform
10.2	How important is it to present DG concepts to the organization's employees?	Not at all important Slightly important Moderately important Very important Extremely important
10.3	What level of priority should be given to presenting DG concepts to the organization's employees?	No priority Low priority Neutral High priority Maximum priority
10.4	What is the level of complexity in training employees in DG concepts?	No complexity Low complexity Moderate complexity High complexity Extreme complexity
10.5	List the main challenges that prevent employees from being trained in DG concepts	
10.5	List the main challenges encountered during employee training in DG concepts	
11	DATA GOVERNANCE POLICY (DGP)	
11.1	Regarding the definition of a DGP for the organization?	Prepared and applied It is in the development phase Intends to prepare Won't elaborate
11.2	How important is it to develop and implement a DGP?	Not at all important Slightly important Moderately important Very important Extremely important
11.3	What level of priority should be given to developing and implementing a DGP?	No priority Low priority Neutral High priority Maximum priority
11.4	What is the level of complexity in developing a DGP?	No complexity Low complexity Moderate complexity High complexity Extreme complexity
11.5	What is the level of complexity in implementing a DGP?	No complexity Low complexity Moderate complexity High complexity Extreme complexity
11.6	List the main challenges that prevent the development and implementation of a DGP	
11.7	List the main challenges encountered during the implementation of the DGP	
11.8	Regarding the presentation of DGP to the organization's employees?	Performed Is currently being performed Intends to perform Will not perform
11.9	How important is it to present DGP to the organization's employees?	Not at all important Slightly important Moderately important Very important Extremely important
11.10	What level of priority should be given to presenting DGP to the organization's employees?	No priority Low priority Neutral High priority Maximum priority
11.11	What is the level of complexity in presenting the DGP to the organization's employees?	No complexity Low complexity Moderate complexity High complexity Extreme complexity
11.12	List the main challenges that prevent the presentation of the DGP to the organization's employees	
11.13	List the main challenges encountered when presenting the DGP to the organization's employees	
12	PRIVACY AND DATA SECURITY POLICY (PDSP)	
12.1	Regarding the definition of a PDSP for the organization?	Prepared and applied It is in the development phase Intends to prepare Won't elaborate
12.2	How important is it to develop and implement a PDSP?	Not at all important Slightly important Moderately important Very important Extremely important
12.3	What level of priority should be given to developing and implementing a PDSP?	No priority Low priority Neutral High priority Maximum priority

Continuation of the Table 1		
	Question	Alternatives
12.4	What is the level of complexity in developing a PDSP?	No complexity Low complexity Moderate complexity High complexity Extreme complexity
12.5	What is the level of complexity in implementing a PDSP?	No complexity Low complexity Moderate complexity High complexity Extreme complexity
12.6	List the main challenges that prevent the development and implementation of a PDSP	
12.7	List the main challenges encountered during the implementation of the PDSP	
12.8	Regarding the presentation of PDSP to the organization's employees?	Performed Is currently being performed Intends to perform Will not perform
12.9	How important is it to present the PDSP to the organization's employees?	Not at all important Slightly important Moderately important Very important Extremely important
12.10	What level of priority should be given to presenting the PDSP to the organization's employees?	No priority Low priority Neutral High priority Maximum priority
12.11	What is the level of complexity in presenting the PDSP to the organization's employees?	No complexity Low complexity Moderate complexity High complexity Extreme complexity
12.12	List the main challenges that prevent the presentation of the PDSP to the organization's employees	
12.13	List the main challenges encountered when presenting the PDSP to the organization's employees	
13	DATA QUALITY POLICY (DQP)	
13.1	Regarding the definition of a DQP for the organization?	Prepared and applied It is in the development phase Intends to prepare Won't elaborate
13.2	How important is it to develop and implement a DQP?	Not at all important Slightly important Moderately important Very important Extremely important
13.3	What level of priority should be given to developing and implementing a DQP?	No priority Low priority Neutral High priority Maximum priority
13.4	What is the level of complexity in developing a DQP?	No complexity Low complexity Moderate complexity High complexity Extreme complexity
13.5	What is the level of complexity in implementing a DQP?	No complexity Low complexity Moderate complexity High complexity Extreme complexity
13.6	List the main challenges that prevent the development and implementation of a DQP	
13.7	List the main challenges encountered during the implementation of the DQP	
13.8	Regarding the presentation of DQP to the organization's employees?	Performed Is currently being performed Intends to perform Will not perform
13.9	How important is it to present DQP to the organization's employees?	Not at all important Slightly important Moderately important Very important Extremely important
13.10	What level of priority should be given to presenting DQP to the organization's employees?	No priority Low priority Neutral High priority Maximum priority
13.11	What is the level of complexity in presenting the DQP to the organization's employees?	No complexity Low complexity Moderate complexity High complexity Extreme complexity
13.12	List the main challenges that prevent the presentation of the DQP to the organization's employees	
13.13	List the main challenges encountered when presenting the DQP to the organization's employees	

End of the Table 1

Table 2: Web form used at the Second Stage of research.

	Question	Alternatives to be ranked
I	ACTIONS RELATED TO INVENTORY / INFORMATION MAPPING	
01	How would you rate the IMPLEMENTATION of these Inventories / Information mappings?	- Data Inventory - Process Mapping - Regulatory Survey - Infrastructure Mapping
02	How would you rate these challenges that PREVENT the PERFORMANCE of Inventory / Information Mapping?	- Planning / prioritization - Diversity of technologies / environments systems - Support of tools - Existing / updated documentation - Employee engagement - Culture / knowledge / training - Perception of value / benefits - Management support - Well-defined / clear strategy
03	How would you rate these challenges that IMPACT the EXECUTION of Inventory / Information Mapping?	- Planning / prioritization - Diversity of technologies / environments systems - Support of tools - Existing / updated documentation - Employee engagement - Culture / knowledge / training - Perception of value / benefits - Management support - Well-defined / clear strategy
II	ACTIONS RELATED TO POLICIES	
04	How would you rate the PREPARATION of these Policies?	- Data Governance Policy - Data Privacy and Security Policy - Data Quality Policy
05	How would you rate these challenges that PREVENT the DEVELOPMENT of Policies?	- Planning / prioritization - Diversity of technologies / environments systems - Support of tools - Employee engagement - Culture / knowledge / training - Perception of value / benefits - Management support - Well-defined / clear policies - Well-defined / clear processes
06	How would you rate these challenges that IMPACT on POLICY MAKING?	- Planning / prioritization - Diversity of technologies / environments systems - Support of tools - Employee engagement - Culture / knowledge / training - Perception of value / benefits - Management support - Well-defined / clear policies - Well-defined / clear processes
07	How would you rate the IMPLEMENTATION of these Policies?	- Data Governance Policy - Data Privacy and Security Policy - Data Quality Policy
08	How would you rate these challenges that IMPACT the IMPLEMENTATION of Policies?	- Planning / prioritization - Diversity of technologies / environments systems - Support of tools - Employee engagement - Culture / knowledge / training - Perception of value / benefits - Management support - Well-defined / clear policies - Well-defined / clear processes
III	ACTIONS RELATED TO TRAINING / TRAINING / PRESENTATION	
09	How would you rate the PRESENTATION of these Training / Presentations?	- Data Governance Concepts - Data Governance Policy - Data Privacy and Security Policy - Data Quality Policy
10	How would you rate these challenges that PREVENT the PRESENTATION of Training / Presentations?	- Planning / prioritization - Clear / defined policies - Alignment / communication - Employee engagement - Culture / knowledge / training - Perception of value / benefits - Management support - Well-defined / clear strategy
11	How would you rate these challenges that IMPACT the PRESENTATION of Training / Presentations?	- Planning / prioritization - Clear / defined policies - Alignment / communication - Employee engagement - Culture / knowledge / training - Perception of value / benefits - Management support - Well-defined / clear strategy
IV	ACTIONS RELATED TO THE MANAGEMENT COMMITTEE	
12	How would you rate these challenges that PREVENT the CREATION of a Management Committee?	- Planning / prioritization - Clear / defined policies - Employee engagement - Culture / knowledge / training - Perception of value / benefits - Management support - Well-defined / clear strategy
13	How would you rate these challenges that IMPACT the PERFORMANCE of the Management Committee?	- Planning / prioritization - Clear / defined policies - Employee engagement - Culture / knowledge / training - Perception of value / benefits - Management support - Well-defined / clear strategy
V	GROUP OF ACTIONS	
14	How would you rate the IMPLEMENTATION of these Group of Actions?	- Carrying out the Inventory / Mapping information - Policy Development - Implementation of elaborated Policies - Carrying out the Training / Training / Presentation - Creation of a Management Committee - Performance of established Management Committee