HELLENIC OPEN UNIVERSITY

School of Social Sciences

Master in Business Administration (MBA)

Postgraduate Dissertation

"The role of regulatory requirements as a change management process in the banking industry. The case of Risk Data Aggregation and Risk Reporting (RDARR)."

Vasileios Stamatis

Supervisor: George Androulakis

Patras, Greece, May 2026

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Patras, Greece, May 2026

“Acknowledgments and / or Dedication”

“A mind is like a parachute. It doesn't work if it is not open.”

“Το μυαλό είναι σαν το αλεξίπτωτο. Δεν λειτουργεί, αν δεν είναι ανοικτό.”

— Frank Zappa (1940-1993)

Abstract

Banking industry is undergoing a transformative shift, evolving into innovative tech industry. The critical success factors to achieve this vision are complicated and the rate of failure is high if companies do not focus enough on these during their transformation journey. This dissertation aims to investigate how regulatory requirements, with specific reference to risk data aggregation and risk reporting (RDARR), necessitate a robust change management framework within the banking sector, with a particular focus on the Greek banking industry.

The primary objective of RDARR is to ensure that banking institutions possess the capacity to generate accurate, complete, and timely risk data, both within normal operational parameters and during periods of heightened stress. This may be regarded as a large-scale change program, for which organizational, technological, and cultural changes are required.

The study will examine what are the strategic directions that establish RDARR as a change management enabler within the banking sector, alterations in business model and operational processes, as its adoption is moving from operational to strategic and identify how RDARR and BCBS 239 represent more than just a technical IT or data-centric challenge, but it is rather a catalyst for profound organizational transformation. The study will also look ahead to present implications and effects on personnel planning and development.

The research will employ a combination of literature review and primary research which will provide a practical review of the topic and allow for in-depth exploration of the research questions. As such the specific area of study will provide insights into practical applications and contribute to academic knowledge in this emerging field.

Keywords

BCBS 239, RDARR, Banking Industry, Human resource development.

“ Ο ρόλος των κανονιστικών απαιτήσεων στην διαδικασία διαχείρισης αλλαγών στον τραπεζικό κλάδο. Η περίπτωση της συγκέντρωσης δεδομένων κινδύνου και της αναφοράς κινδύνου (RDARR).”

Βασίλειος Σταμάτης

Περίληψη

Ο τραπεζικός τομέας βρίσκεται σε φάση μετασχηματισμού, εξελισσόμενος σε μια τεχνολογικά προηγμένη βιομηχανία. Οι κρίσιμοι παράγοντες επιτυχίας για την επίτευξη αυτής της μεταβολής είναι περίπλοκοι και το ποσοστό αποτυχίας υψηλό αν οι εταιρείες δεν εστιάσουν αρκετά στους στόχους τους κατά τη διάρκεια του μετασχηματισμού τους.

Η παρούσα εργασία έχει ως στόχο να διερευνήσει πώς οι κανονιστικές απαιτήσεις, με ειδική αναφορά στη συγκέντρωση δεδομένων κινδύνου και την αναφορά κινδύνου (RDARR), δημιουργούν ένα πλαίσιο αλλαγών στον τραπεζικό τομέα, με ιδιαίτερη έμφαση στον ελληνικό τραπεζικό κλάδο. Ο πρωταρχικός στόχος του RDARR είναι να διασφαλίσει ότι τα τραπεζικά ιδρύματα διαθέτουν την ικανότητα να παράγουν ακριβή, πλήρη και έγκαιρα δεδομένα κινδύνου, τόσο εντός των κανονικών συνθηκών λειτουργίας τους όσο και σε περιόδους αυξημένου κινδύνου.

Το RDARR από την φύση του είναι ένα πρόγραμμα αλλαγών μεγάλης κλίμακας για το οποίο απαιτούνται οργανωτικές και τεχνολογικές αλλαγές. Η μελέτη θα εξετάσει στο ποιες είναι οι στρατηγικές κατευθύνσεις που καθιστούν το RDARR ως παράγοντα αλλαγών στο επιχειρησιακό μοντέλο και τις διαδικασίες, καθώς η υιοθέτησή του ανάγεται πλέον σε στρατηγική θέση. Το RDARR και το BCBS 239 αντιπροσωπεύουν κάτι περισσότερο από μια τεχνική πρόκληση που αφορά την πληροφορική ή τα δεδομένα, αλλά μάλλον αποτελεί έναν καταλύτη για βαθιά οργανωτική μεταμόρφωση. Η μελέτη θα εξετάσει επίσης τις μελλοντικές προκλήσεις που προκύπτουν και τα αποτελέσματα στον προγραμματισμό και την ανάπτυξη του προσωπικού.

Η έρευνα θα χρησιμοποιήσει ένα συνδυασμό βιβλιογραφικής ανασκόπησης και πρωτογενούς έρευνας, η οποία θα προσφέρει μια πρακτική ανασκόπηση του θέματος και θα επιτρέψει την σε βάθος διερεύνηση των ερευνητικών ερωτημάτων. Ο συγκεκριμένος τομέας μελέτης είναι εξαιρετικά επίκαιρος και δυναμικός και θα προσφέρει πληροφορίες σχετικά με τις πρακτικές εφαρμογές συμβάλλοντας στην ακαδημαϊκή γνώση σε αυτόν τον αναδυόμενο τομέα.

Λέξεις – Κλειδιά

BCBS 239, RDARR, Τραπεζικός Τομέας, Ανάπτυξη Ανθρώπινου Δυναμικού.

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List of Abbreviations & Acronyms

Acronym	Definition
AI	Artificial Intelligence
AnaCredit	Analytical Credit Datasets – EU regulatory reports for the collection of granular credit and credit risk data sets
BCBS 239	Basel Committee on Banking Supervision standard #239 – “Principles for effective risk data aggregation and risk reporting”
BDO	Business Data Owner
BDS	Business Data Steward
BI	Business Intelligence
BIS	Bank for International Settlements
BoD	Board of Directors
CDAO	Chief Data and Analytics Officer
CDE	Critical Data Element
CDO	Chief Data Officer
CET1	Common Equity Tier 1
CIB	Corporate & Investment Banking
COO	Chief Operating Officer
COREP	Common Reporting (EU regulatory capital reports required by EBA)
CRD	Capital Requirements Directive
CRR	Capital Requirements Regulation
DBA	Domain Business Analyst
DDM	Domain Data Manager
DG	Data Governance
DGC	Data Governance Committee
DGF	Data Governance Framework
DGO	Data Governance Office
DGWG	Data Governance Working Group
DMBOK	Data Management Body of Knowledge
DORA	Digital Operational Resilience Act
DQ	Data Quality
EBA	European Banking Authority
ECB	European Central Bank
ESG	Environmental, Social and Governance
ETL	Extract, Transform, Load
EUC	End-User Computing
FINREP	Financial Reporting – EU regulatory financial reports (balance sheet, P&L, etc.)
GIA	Group Internal Audit
HRM	Human Resource Management
ICAAP	Internal Capital Adequacy Assessment Process

ICT	Information & Communication Technology
IFRS 9	International Financial Reporting Standard 9
ILAAP	Internal Liquidity Adequacy Assessment Process
IT	Information Technology
ITS	Implementing Technical Standards
KPIs	Key Performance Indicators
KQI	Key Quality Indicator
KRI	Key Risk Indicator
LOB	Line of Business
LoD	Line of Defense
M&A	Mergers & Acquisitions
MAR	Management Accepts Risk
MECE	Mutually Exclusive and Collectively Exhaustive
NPE	Non-Performing Exposures
OSI	On Site Inspections
RAF	Risk Appetite Framework
RDARR	Risk Data Aggregation and Risk Reporting
RID	Risk Identification Process
ROI	Returns On Investment
RTS	Regulatory Technical Standards
RWA	Risk Weighted Assets
SaaS	Softare as a Service
SDLC	Software Development Life-Cycle
SLA	Service Level Agreement
SME	Subject Matter Expert
SREP	Supervisory Review and Evaluation Process
SSM	Single Supervisory Mechanism
TOM	Target Operating Model
UAT	User Acceptance Test

1. Introduction

During the last decade financial institutions have tried to improve themselves in numerus areas by redesigning business and operations models resulting in effectively managing risk and complying with regulatory requirements. Financial institutions adapted to this new era by combining changes with their strategic and operational levels and improved the data used for risk, financial and supervisory reporting.

The financial sector is now considering innovative technologies as part of their most significant investments, realizing that those will influence their strategies and policies as much as their financial, environmental, social, and economic priorities. It is a fact that financial sector and banks would be affected by the technological wave that is taking place and will force them to change dramatically.

Nowadays supervisory expectations are increasingly appearing in the financial sector, requesting reliable data as a precondition for solid and adequate decision-making both at normal times and during times of stress. The emergence of regulations influences the institutions, and they need to constantly adjust their operations and redesign their agenda with new strategies and series of actions to accommodate all those new requirements.

The present research has been based on literature review, the contributions from banking industry professionals, and a case study trying to combine theoretical knowledge with the practical implementations in the banking industry for an in-depth assessment of institutions' governance, risk data aggregation capabilities, and risk reporting practices.

1.1 Background information

At the beginning of the 20th century, data analysis was done using basic statistical methods. The rise of BI tools in the 1980s and 1990s allowed information to be examined based on historical data in addition to descriptive analysis. The exponential growth of data from the internet and social media as well as the advent of cloud computing has made it easier to store data, and marked the era of big data, in which advanced analytical tools and techniques such as ML and AI are being developed and have pushed advanced analytics to new heights[1].

[1] https://www.ibm.com/think/topics/advanced-analytics

Today, Artificial Intelligence (AI) and Advanced Analytics (AA) have become tools of particular importance for the expansion of the banking ecosystems. AI technologies such as machine learning (ML), natural language processing (NLP), voice recognition have significantly impacted the marketing strategy of the banking sector. By adopting them, banks are looking to create innovative solutions and products that satisfy customers while reducing operational time and increasing productivity[2].

Moreover, numerous analyses and reports have indicated that investment in AI and generative AI is scaling up globally, valued at over €130 billion in 2023 and is expected to grow by 2030, up to €1.9 trillion[3].

Of course, the mix of investments in technology versus the strategic priorities regarding costs and efficiency is of equal importance for European banks[4]. The impact of technological advancements can lead to the empowerment of both large and small organizations and individuals. The transformative nature of these technologies is likely to have an impact on economies and social developments[5].

The European Banking Federation believes that the adoption of such solutions will help to improve customer experience, improve cybersecurity, and strengthen risk management. Nevertheless, significant concerns have been expressed about the employment aspects of the emerging technological solutions, both in terms of risks and opportunities for bank employees[6].

At the same time, a strict regulatory framework is already in place as dialogue between supervisors, regulators and the banking sector across Europe is essential for the successful implementation of those technologies.[7]

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[2] https://www2.deloitte.com/us/en/pages/consulting/articles/ai-in-banking.html

[3] https://www.europarl.europa.eu/RegData/etudes/ATAG/2024/760392/EPRS_ATA(2024)760392_EN.pdf

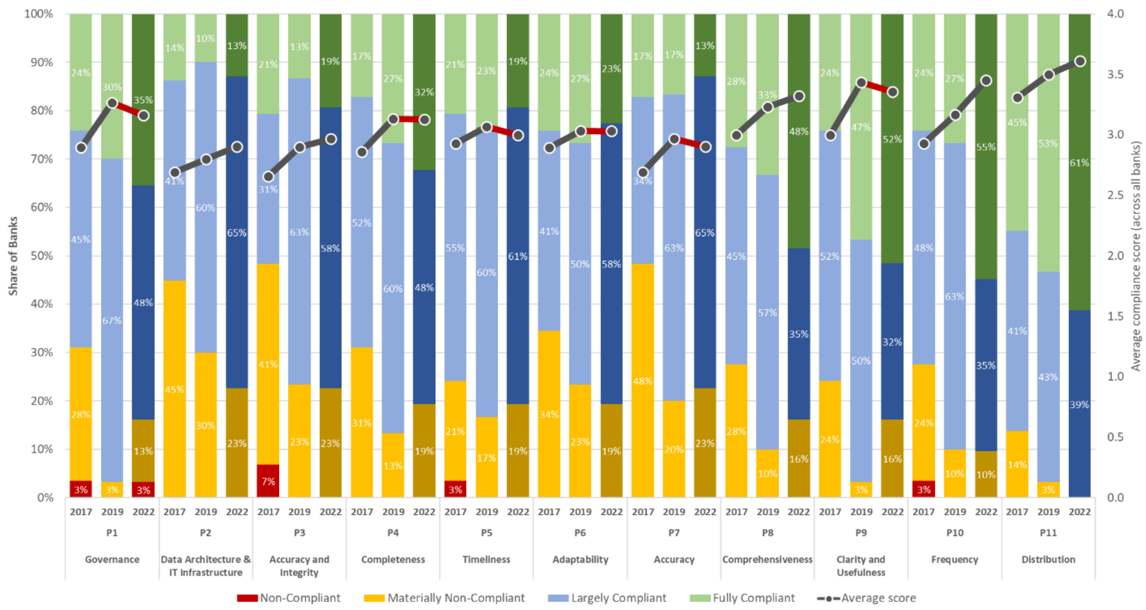
[4] https://www.finextra.com/the-long-read/1082/ai-spending-races-ahead-among-european-banks

[5] https://commission.europa.eu/topics/strengthening-european-competitiveness/eu-competitiveness-looking-ahead_en#paragraph_47059

[6] https://www.ebf.eu/ebf-media-centre/european-social-partners-for-the-banking-sector-sign-new-joint-declaration-on-employment-aspects-of-artificial-intelligence/

[7] https://www.ebf.eu/priorities/innovation-cybersecurity/artificial-intelligence/

Banking as a business is based on information. Since the global monetary crisis in 2008 the regulators realized that many banks are lacking governance and adequate technologies to accommodate and aggregate data to monitor their exposures and risks. Starting from January 2013 the Basel Committee published BCBS 239 principles[8] regarding effective risk data aggregation and risk reporting (RDARR). Bank for International Settlements (BIS) has conducted periodical progress, adopting reviews seeking banks to do better. A decade after the initial publication very few banks have fully complied with those principles. (Basel Committee on Banking Supervision, Progress in adopting the Principles for effective risk data aggregation and risk reporting, 2023)



BCBS 239 compliance ratings by Principle 1

BCBS 239 compliance ratings by Principle in 2017, 2019 and 2022 [9]

As a result, ECB launched in May 2024 a new updated guide on effective RDARR, following a consultation for over a year.[10] The new guide sets the expectations on how banks should implement the BCBS 239 principles, tightening the requirements for risk data and data governance and forcing tremendous pressure to the financial institutions for complete compliance.[11]

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8 Principles for effective risk data aggregation and risk reporting

9 https://www.bis.org/bcbs/publ/d559.htm

10 Guide on effective risk data aggregation and risk reporting

11 ECB ratchets up the pressure on risk data aggregation

1.2 Purpose of dissertation

The purpose of this study is to identify the ways and strategies that banks are following in complying with RDARR guides and BCBS 239 principles in terms of strategic management provision, alignment with the risk management framework, structured technological implementations and solutions, resource allocation and the implications on productivity, efficiency, and engagement. As a case study it will concentrate on one of the Greek systemic banks namely XYZ Bank.
This research is motivated by my professional involvement and experience, as an active data governance practitioner, as well as the broader trend in the banking industry. Throughout my professional career I have encountered numerous challenges in the field of analytics and business intelligence, project management, and data governance initiatives. Additionally, during my research in Greek literature, I have not found any significant material on this topic, as it is a new field, and this was quite a challenge.

The present research was elaborated out of the need to understand the regulatory trend in the banking industry as regards to the data governance frameworks with the objective of providing reliable information that will prompt policy makers to take advantage of the emerging trend in the adoption of such regulatory expectations and to contribute to academic understanding and the practical applications that banks incorporate from these requirements.

The study initially aims to highlight how RDARR is adopting by banks and the effects to their business model and organizational framework. Secondly the knowledge gained from this study could be used to inform and improve existing policies and practices regarding the impact on the adoption of those regulations by human resources. At a broader level, this research aims to highlight the challenges of RDARR and delve deeper into how banks are dealing with the increasing changes in regulatory frameworks.

The primary research question of this thesis is: "Do regulatory requirements and specifically RDARR compliance act as a change management process?"

1.3 Outline of the dissertation

The outline of the thesis contains several chapters, each of which has a separate creative contribution to the aims of the study.

The introductory chapter gives us an overview of the rapid evolution of regulations and their growing significance in banking, introduces us to the purpose of the study regarding the influence of RDARR in banking operations and the effect on workforce dynamics, followed by a description of the methods and design to collect the study information.

The literature review chapter analyses the context of the research and delineates the current knowledge of the research area, presenting the existing theoretical frameworks in operational change and also exhibits the role of data governance in the current era.

The third chapter examines the expected value of the application of those regulations, and how those guides induce data-driven insights for better decision-making presenting a Porter's value-chain equivalence for data governance and data management operations.

The methodology chapter then details the process of data analysis, evaluation of findings and conclusions. The conclusions chapter brings together and summarizes the key findings of the research and the practical for the banking industry. It also exposes insights and suggests areas for further research based on the study's findings.

1.4 Research approach

This section presents a brief description of the bibliographic sources and the research approach in terms of design, structure and methods used for data collection. The detailed and extended analysis is presented in a separate chapter.

The literature review seeks to answer questions about how companies are integrating regulatory requirements into their processes and functions, and the implications for strategic management. Given the advances in this rapidly changing field of artificial intelligence (AI), the methodological approach to the literature review used academic databases such as Google Scholar, ResearchGate and SCOPUS, but mainly articles from the internet and company websites.

The second approach was to collect qualitative data from semi-structured interviews conducted with banking industry experts who were invited to contribute to this paper with their personal perspective, expertise, and knowledge. The interviewed participants were informed to accept or reject a Participant Consent Form regarding their voluntary participation on the purpose of the research.

In addition, a survey using a questionnaire was chosen (primary research) to collect quantitative data. The questionnaire addressed banking employees, indicating that all answers were anonymous to ensure confidentiality. The direct case study method provided statistical data and insights into the real perspective of the industry. Microsoft Forms was used to collect data and Microsoft Power BI and SAS was used to analyze and present the results using also the AI capabilities of those software solutions.

Copies of the questionnaires used are presented in appendices A and B of this paper.

2. Literature review

This chapter contains information regarding the main concept of the dissertation. The purpose of this chapter is to look at the theoretical framework underpinning the study. Initially there are introductory sections and definitions about change management and the factors that drive it, mentioning the process that is typically followed. The second part of this chapter is to introduce and describe various regulatory requirements and the concept of data governance.

In researching the literature review, a structured search methodology used on a number of databases and publishers with keywords and query formulation. The goal was to ensure (as much as possible) that a significant collection of relevant academic and corporate information have been covered.

To ensure an extensive collection of literature, the search used several databases and publishers (indicatively I mention):

- Google Scholar, utilized for its extensive repository of academic papers and publications.
- Google, used for its general search capabilities to access grey literature[12] and publications.

[12] https://www.lib.auth.gr/en/%CE%B3%CE%BA%CF%81%CE%AF%CE%B6%CE%B1-%CE%B2%CE%B9%CE%B2%CE%BB%CE%B9%CE%BF%CE%B3%CF%81%CE%B1%CF%86%CE%AF%CE%B1

- LinkedIn, a professional network with access to articles and insights.
- Scopus served as a primary source for accessing academic journal and academic literature across various sectors.
- ResearchGate was also particularly useful to current research project.

The following keywords and their combinations were used with consideration of their relevance in the formulation of the search queries aiming to retrieve collections of literature: RDARR, Risk Data Aggregation and Risk Reporting, BCBS 239, Regulatory requirements, Change Management, Business value, Data governance, Job roles, and responsibilities etc. To maximize the effectiveness of the search queries, Boolean operators like
'AND', 'OR', and 'NOT' were used to combine keywords, quotation marks to conduct a "hole" phrase search and sometimes "wildcard" to result in variations of a keyword.

To ensure the research remains relevant, due to the dynamic nature of the subject, no exclusion criteria was utilized in terms of non-academic sources or language barriers, except for documents with restricted access or requiring special permissions.

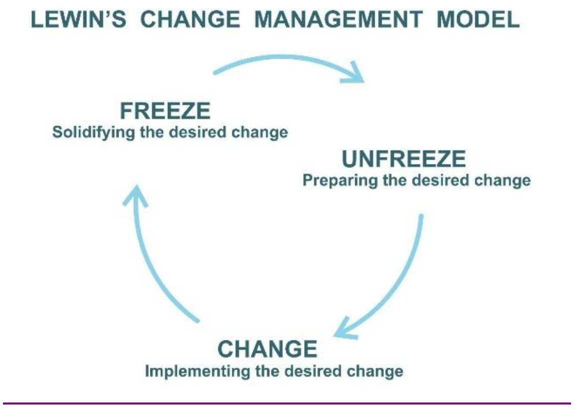
2.1 Theoretical foundations of change management

In today's rapidly changing environment, organizational change is an especially principal issue along with conflict management (Mihiotis, Volume 1: Management, 2005). According to RDARR guide the management body should ensure that RDARR is a key priority for the institution, and adequate and sufficient material, financial and human resources are dedicated to it. Additionally, it should ensure that change management processes are effectively managed and integrated into the institution's governance framework. (European Central Bank, Guide on effective risk data aggregation and risk reporting (RDARR), 2024)

Change management explores how organizations transition from a current state to a desired future state. The literature under this established academic field can be divided into foundational models focused on structured steps and modern perspectives focused on digital transformation and sustainability.

2.1.1 Foundational models

Kurt Lewin's 3-Phase Model (Lewin, 1947) often considered the first major contribution to the field, Lewin introduced his three stages model of change process: unfreezing (preparing for change), moving/changing (implementing the transition), and refreezing (institutionalizing the new state) which posits that successful change involves preparing an organization to accept change, implementing the change, and then solidifying the new state. Although influential, this simple linear model has faced criticism for oversimplifying the change process in modern complex environments (Kanter et al., 1992); (Child, 2005). Nonetheless, the core idea which remains a cornerstone of change management theory is that organizations must disrupt the status quo, managers should enhance the change process with new behaviors, and then employees will embed these behaviors into culture. (Sheikh Hamdo, 2021) (Bekmukhambetova, 2021)

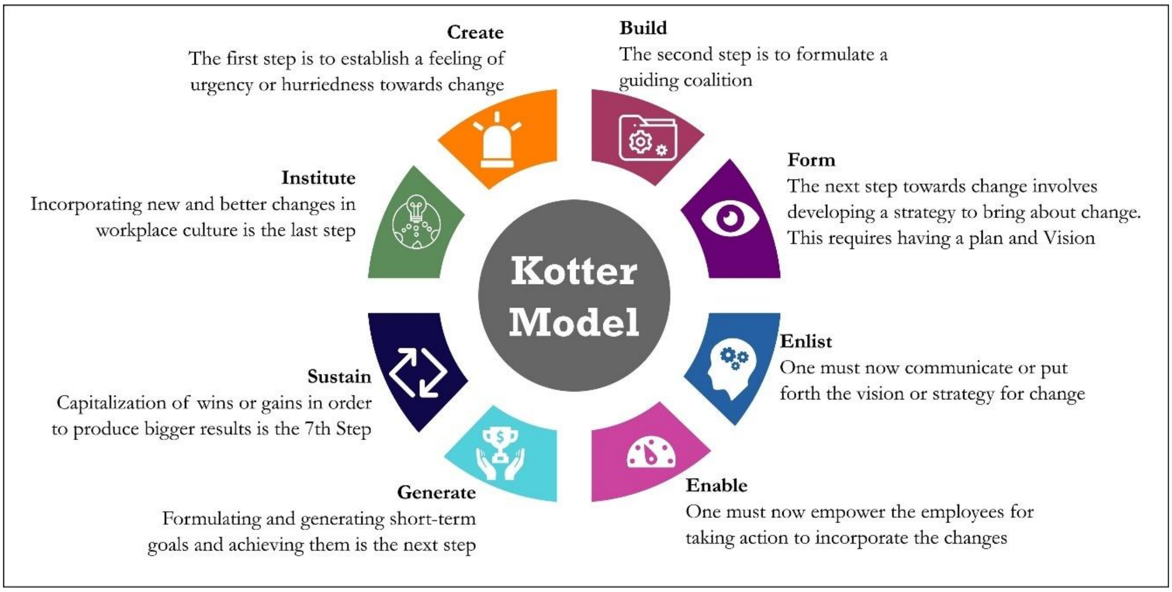


Lewin's Change Management Model 2
Source: AI generated

Kotter's 8-Step Process (1995/1996). In his book "Leading change" John Kotter proposed a more detailed framework that provides a top-down corporate roadmap and refined the approach by emphasizing a "sense of urgency" and "guiding coalitions." His model is widely used for large-scale corporate transformations and outlines a sequence: (1) establish a sense of urgency, (2) form a powerful guiding coalition, (3) create a vision for change, (4) communicate the vision, (5) remove obstacles/empower action, (6) generate short-term wins, (7) consolidate gains and drive further change, and (8) institutionalize new approaches (Kotter, 1995).

Kotter's framework highlights that change is a process that requires strong leadership and careful management over time. Each step corresponds to common pitfalls in change efforts and argued that 70% of change initiatives fail because leaders skip steps or fail to create a sense of urgency or declaring victory too soon which can derail transformations. (Sheikh Hamdo, 2021) (Bekmukhambetova, 2021)

- **Create Urgency:** Help others see the need for change through a bold, aspirational opportunity statement. Stimulate a compelling need for change, for example by creating a crisis.
- **Build a Guiding Coalition:** Assemble a group with enough power and influence to lead the change.
- **Form a Strategic Vision:** Clarify how the future state will be different from the past state.
- **Enlist a Volunteer Army:** Communicate the vision to drive large-scale buy-in.
- **Enable Action by Removing Barriers:** Eliminate inefficient processes or hierarchies that hinder progress and eliminate barriers.
- **Generate Short-Term Wins:** Create visible, unambiguous successes as soon as possible to build momentum and to keep employees motivated to stay involved in the change.
- **Sustain Acceleration:** Use the momentum to change systems, structures, and policies that do not fit the vision while monitoring the effectiveness of the change and recommend corrective actions.
- **Institute Change:** Articulate the connections between new behaviors and organizational success until they become the "culture."



Kotter's 8-Step Process 3
Source: AI generated

The ADKAR Model was developed by Jeff Hiatt (founder of Prosci)[13], and focuses on the individual employee level, emphasizing five outcomes: Awareness, Desire, Knowledge, Ability, and Reinforcement. In principle, employee's resistance to change regardless of its nature so this model is based on the premise that organizational change can only happen when each individual changes and this can be managed through five stages. (Hiatt, 2006).

- **Awareness:** Of the need for change. Why is the status quo no longer viable?
- **Desire:** To participate and support the change. This is the most difficult stage, as it involves personal choice and overcoming resistance.
- **Knowledge:** On how to change. This involves training and education in new processes or tools.
- **Ability:** To implement required skills and behaviors. Knowledge is theoretical; Ability is the practical application.
- **Reinforcement:** To sustain the change. Rewards, recognition, and feedback loops to prevent "backsliding."

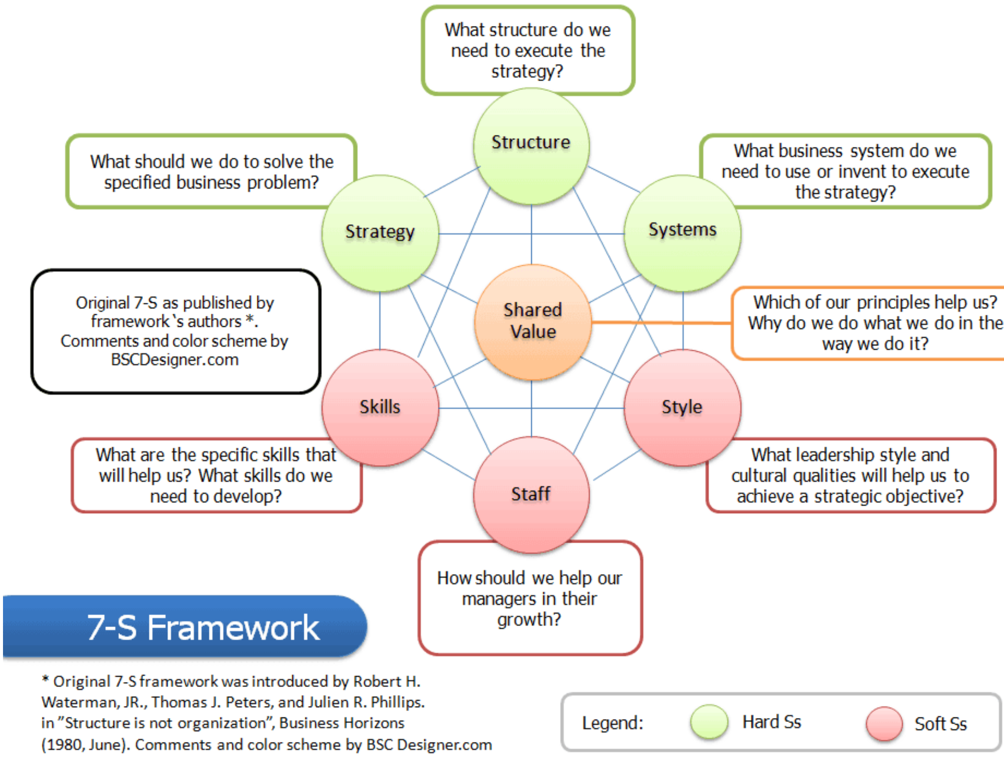
[13] https://www.prosci.com/

ADKAR Model 4
Source: AI generated

McKinsey 7S model introduced by Waterman, Peters, and Phillips in 1980 (Waterman, Peters, & Phillips, 1980) and analyses organization from seven perspectives separated into two distinct categories "hard" and "soft". The "hard" refers to strategy, structure, system, while the "soft" to skills, staff, style, shared values. Although the model does not include steps or prioritize the elements, it is an effective analysis tool that could be applied alongside other change management actions and specify the change needed.[14] (Sheikh Hamdo, 2021)

- Hard
  - Strategy: Company's competitive plan
  - Structure: Organization's setup
  - Systems: Daily operations
- Soft
  - Shared Values: Core company values
  - Skills: Employee abilities
  - Style: Leadership approach
  - Staff: Employee capabilities

[14] https://www.prosci.com/blog/change-management-models



McKinsey 7S model 5

Source: BSC Designer [15]

The Bridges Transition Model (Bridges, 2009) offers a framework for understanding and effectively managing the human side of organizational change. Bridges argues that successful organizational transformation is based on a three-phase process: the Ending What Currently Is, the Neutral Zone, and the New Beginning. According to this model, individuals first realize the loss of the old status quo, then move through an in-between time period when the old is gone but the new isn't fully operational and finally the phase of "New Beginnings" where under new direction and with a fresh identity people feel reoriented and renewed. This perspective shifts the focus of change management from bureaucratic execution to the inner psychological process that people experience during change.

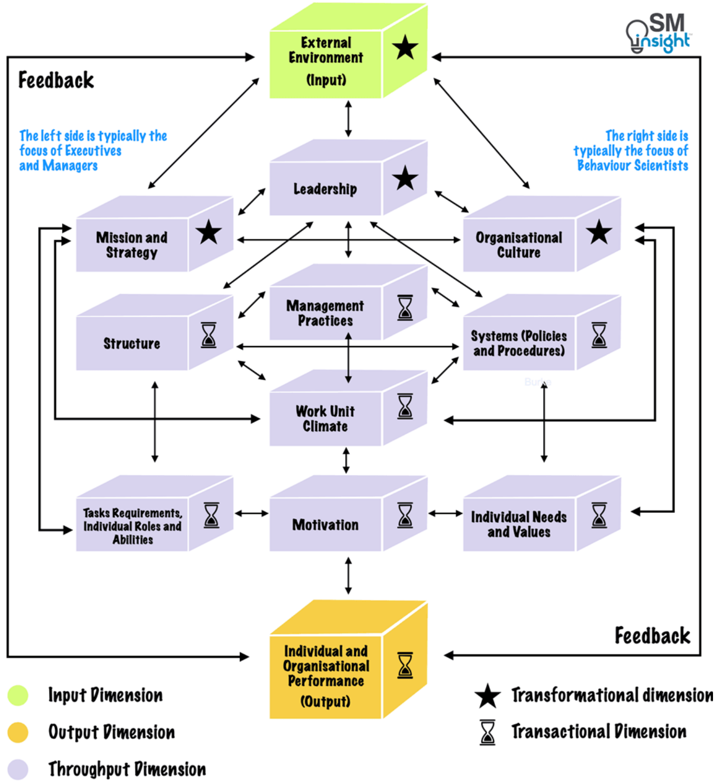
[15] https://bscdesigner.com/7-s-framework.htm

The Burke-Litwin Change Model (Burke & Litwin, 1992) serves as a diagnostic framework for understanding the cause-and-effect relationship between twelve key organizational dimensions during periods of transitional changes:

- External Environment
- Mission & Strategy
- Leadership
- Organisational Culture
- Structure
- Systems
- Management Practices
- Work Unit Climate
- Task & Individual Skills
- Individual Needs & Values
- Motivation
- Individual & Organisational Performance

The model is primarily driven by the external environment, which subsequently influences mission, strategy, leadership, and organizational culture referred also as the “transformational” factors.
The model’s nature is in capturing the complexity of organizational change, because all factors are interconnected, by mapping how shifts in these high-level variables are cascading down to "transactional or operating factors" such as structure, management practices, and systems. The activities that take place daily are influencing the working climate, expectations and units’ cooperation that constitute the “work unit climate.” The last elements referring to individual factors which are key to enabling individual performance. In this model all factors are interconnected and present that changes start externally and transition to individual performance and finally affect the output and organizational performance.

This framework distinguishes between "hard" tangible elements and "soft" abstract factors, providing a structured approach for leaders to predict the impact of proposed changes. (Mudler, 2025) (Quality & Equality, 2020)



The Burke-Litwin Change Model 6
Source: Strategic Management Insight[16]

2.1.2 Models comparison

McKinsey 7s model acts as an analysis tool by which managers can define the opportunities where the change should be conducted. It does not show a clear map of how to manage a change managements model. The other three above-mentioned models (Kotter's **8-Step, ADKAR,** Lewin's **Model**) can be compared considering the common main stages of change management: recognizing the importance of change, transitional stage, the end state. (Sheikh Hamdo, 2021) (Bekmukhambetova, 2021)

[16] https://strategicmanagementinsight.com/tools/burke-litwin-change-management/

<table>
<tr><th>Kotter’s Model</th><th>ADKAR</th><th>Lewin’s Model</th></tr>
<tr><td>Urgency of change</td><td>Awareness</td><td rowspan="3">Unfreeze</td></tr>
<tr><td>Effective Coalition</td><td rowspan="3">Desire</td></tr>
<tr><td>Change Vision</td></tr>
<tr><td>Vision Sharing</td><td rowspan="4">Change</td></tr>
<tr><td rowspan="2">Empowerment</td><td>Knowledge</td></tr>
<tr><td>Ability</td></tr>
<tr><td>Short run Wins</td><td rowspan="3">Reinforcement</td></tr>
<tr><td>Establish on Change</td><td rowspan="2">Refreeze</td></tr>
<tr><td>Make Change Stable</td></tr>
</table>

Change management models comparison 1

Moreover, the pros and cons matrix is shown for reference and comparison.

Model	Primary Focus	Key Pros	Key Cons
Kotter’s 8-Step	Leadership/Momentum	Excellent for urgency and top-down vision, provides a detailed roadmap and is designed with flexibility to be adapted.	Perceives change as a linear, one-time event requiring a big investment of time, effort, and resources.
ADKAR	Individual	Practical, focuses on individual adoption of each person is facing to achieve changes successfully.	Requires a larger methodology to scale to a full organization and demands significant resources. It is focusing on individual change and does not fully address systemic factors and structural adjustments.
Lewin’s Model	Organizational	Simple and easy to communicate. The model emphasizes preparation, offering a	Too high-level focusing on linear execution. It also oversimplifies the implementations changes that today’s complex

		step-by-step structure that is easy to follow and execute.	environments companies are facing.
McKinsey 7-S	Structural Alignment	Look at how distinct parts of a company interact.	Descriptive rather than prescriptive which lacks a step-by-step "how-to."

Change managements models pros & cons 2

2.1.3 Contemporary trends in Change Management

Recent literature has moved away from traditional step-by-step models to address the complexities of the digital age and the human element of change.

- **Digital Transformation:** Recent studies highlight that change management is no longer just about process, it is rather a prerequisite for successful digital transformation. Effective leadership in the digital age involves integrating technology into organizational processes to facilitate agility (Sacavém, et al., 2025) (Sidik, Winadi, & Ari, 2024)
- **The agile change management model:** Draws guidelines from Agile methodologies which are common in software development and emphasizes in adaptability and rapid reactions to evolving market conditions. In a way it replaces conventional linear approaches, fostering cross-functional operation. (Koilakonda & Franklin, 2025)
- **Employee Experience and Well-being:** Emotional effects emphasize engagement and well-being. The idea used by organizations is to create a working environment that reduces uncertainty. Open communication and workers who collaboratively participate in decision making are factors that foster dedication and satisfaction in a stressful working environment. (Koilakonda & Franklin, 2025)

2.2 Regulatory frameworks in banking, focus on BCBS 239 and RDARR

In the next chapter, we will present a short and lean description of banking regulations, focusing specifically on BCBS 239 and RDARR, with an attempt to demystify their interrelation along with a brief historical overview of the supervisory priorities of the past decade and the future trends.

2.2.1 A brief description of banking regulations

In the banking sector the mix of regulatory frameworks (CRD, CRR, AI Directive, DORA) and risk domains related (ESG, BCBS 239, RDARR) are highly interconnected. CRD and CRR stands as the primary law while RDARR and DORA are the operational processes following AI act and ESG as the emerging drivers.

CRD[17] (Capital Requirements Directive) and CRR[18] (Capital Requirements Regulation). They work together setting the overall rules for bank governance and risk management, demanding that banks have robust internal controls to ensure sufficient capital to absorb economic shocks.

DORA[19] (Digital Operational Resilience Act) and ICT (Information & Communication Technology)[20]. Their purpose is to ensure that the digital systems holding the data are secure and resilient. (European Union Parliament and Council of the Euro, 2022)

AI Directive[21] (EU AI Act). Banks have started using AI to analyze their data for better decisions (e.g., credit scoring). The AI Directive regulates how you can use these tools safely.

[17] https://www.eba.europa.eu/regulation-and-policy/single-rulebook/interactive-single-rulebook/11764

[18] https://eur-lex.europa.eu/eli/reg/2013/575/oj/eng

[19] https://www.eiopa.europa.eu/digital-operational-resilience-act-dora_en

[20] https://www.eba.europa.eu/activities/single-rulebook/regulatory-activities/internal-governance/guidelines-ict-and-security-risk-management

[21] https://artificialintelligenceact.eu/

ESG[22] (Environmental, Social, Governance). CRD requires banks to report ESG risks and under this concept, banks need to gather ESG data and probably use AI models to predict climate risks.

BCBS 239[23] (principles for effective risk data aggregation and risk reporting) obliges financial institutions to implement eleven overarching principles for the effective aggregation of risk data and standardized reporting. There are also three additional principles regarding the regulatory foundation for transparency and resilience in the financial sector.

RDARR[24] (Risk Data Aggregation and Risk Reporting) has the role of the operational implementation of the requirements from BCBS 239. This ensures that the data used for decisions is accurate, complete, and timely.

Acronym	**Primary Goal**	**Relationship to Others**
CRD	Ensure banks are financially stable and well-governed.	It mandates the governance structures that enforce RDARR, ICT security, and ESG compliance. CRD requires banks to have a clear view of their risks. RDARR & BCBS 239 is the standard that provides timely the information needed for assessing those risks. Regulators use RDARR compliance as a test for CRD governance requirements.
RDARR	Ensure risk data is accurate, complete, and timely.	It provides the trusted data needed for CRD reporting, ESG analysis, and AI model training.

22 https://eur-lex.europa.eu/eli/reg/2024/3005/oj/eng
23 Principles for effective risk data aggregation and risk reporting
24 Guide on effective risk data aggregation and risk reporting

Acronym	**Primary Goal**	**Relationship to Others**
DORA	Ensure digital systems are resilient and secure against cyber-attacks.	ICT regulations like DORA focus on the *system* (servers, cloud, security) while the AI Directive, for example, focuses on the *algorithm* (bias, transparency, human oversight). You cannot have a compliant AI system if it runs on non-compliant ICT infrastructure. Consider that RDARR principles flow through the ICT infrastructure.
AI Directive	Ensure AI is safe, transparent, and non-discriminatory.	It limits how AI can be used on RDARR data. High-risk AI data (e.g., credit scoring) experiences strict CRD governance.
ESG	Promote sustainability and measure non-financial risks (Climate, etc.).	A risk type mandated by CRD and requires massive data aggregation while often uses AI for modeling. Banks have good financial data, but they often have poor "emissions data" or "social impact data." RDARR principles force banks to treat ESG data with the same rigor as financial data (accuracy, lineage, timeliness).

List of banking regulations 3

2.2.2 Deep dive into BCBS 239 and RDARR

In 2013 Basel Committee on Banking Supervision (BCBS) released a new set of standards to help banks manage their risk data aggregation and risk reporting practices more efficiently. Those standards consist of a set of fourteen principles separated into the following four categories[25] and the original date for implementation was set on January 2016:

- Overarching governance and infrastructure which are the foundational principles for managing risk data across the organization.
- Risk data aggregation capabilities focused on collecting, processing, and adapting risk data.
- Risk reporting practices related to the accuracy, clarity, and frequency of risk reports.
- Supervisory review and cooperation on how regulators evaluate compliance and collaborate across borders.

The purpose is to strengthen financial stability with trusted data provided, revealing clarity for regulators and leads to informed decisions by the financial institutions.

BCBS239 Principles 7
Source: Workina BCBS239 Principles[26]

[25] https://www.actian.com/bcbs-239/

[26] https://www.workiva.com/blog/rdarr-101-risk-data-aggregation-and-risk-reporting-explained

Overarching Governance and Infrastructure (Principles 1–2)

- **Governance:** Requires strong governance arrangements for risk data aggregation and reporting, with clear roles, responsibilities, and accountability for data quality and controls assigned to senior management and the board.
- **Data Architecture:** Requires a bank to design, build, and maintain a fully integrated data architecture and IT infrastructure that supports risk data aggregation and reporting, even during times of stress.

Risk Data Aggregation Capabilities (Principles 3–6)

These principles define the quality standards that the aggregated risk data must meet. They require new processes, controls, and data management technologies to replace manual and fragmented systems.

- **Accuracy and Integrity:** Risk data must be accurate and reliable, and generated on a consistent basis. This often requires establishing a single, authoritative source (or a single golden definition) for Critical Data Elements (CDEs).
- **Completeness:** A bank must be able to capture and aggregate all material risk data across the banking group (legal entities, risk categories, etc.) to produce a comprehensive view of risk.
- **Timeliness:** Risk data must be aggregated and available in a timely manner, both under normal conditions and, critically, during times of stress or crisis.
- **Adaptability:** The system must be flexible enough to meet a broad range of on-demand, ad hoc reporting requests (e.g., during a stress test or due to emerging risks).

Risk Reporting Practices (Principles 7–11)

This section focuses on the **quality, utility, and distribution** of the final risk reports, emphasizing that reports must be concise and actionable for senior decision-makers.

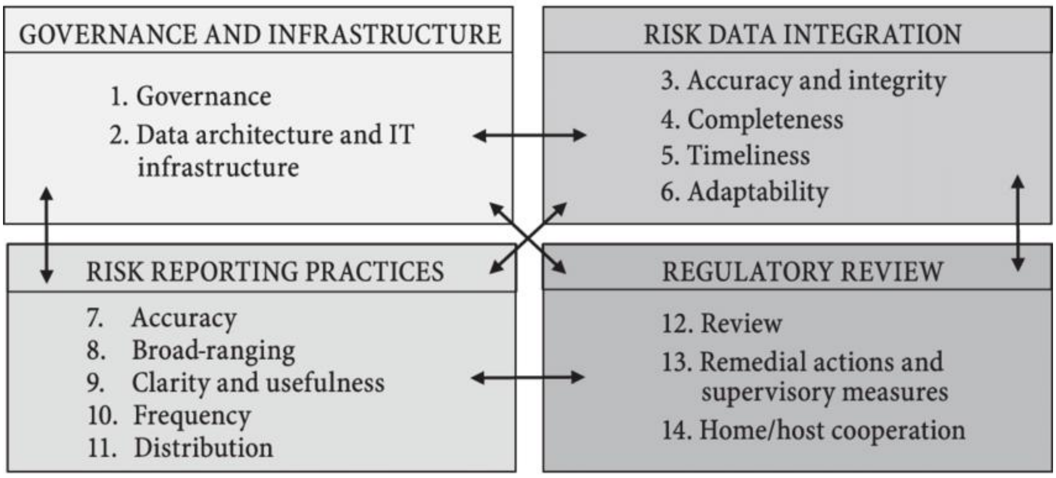
- **Accuracy:** Risk reports must accurately and precisely convey aggregated risk data, and the information should be subject to reconciliation and validation to ensure consistency.
- **Comprehensiveness:** Reports must cover all material risk areas and reflect the overall complexity and scope of the bank's activities.

- **Clarity and Usefulness:** Reports must be clear, concise, and useful to their intended recipients (especially the Board of Directors and Senior Management), providing a balance of data, analysis, and conclusions.
- **Frequency:** The frequency of reporting must be appropriate for the recipients' needs and risk profile, ensuring timely decision-making.
- **Distribution:** Reports should be distributed to the appropriate recipients who require the information to perform their respective roles effectively.

Supervisory Review (Principles 12–14)

These three principles apply to the supervisory authorities (like the ECB or local central banks), outlining their role in ensuring banks comply with the first eleven principles.

- **Review:** Supervisors should periodically review and evaluate a bank's compliance with the other eleven principles.
- **Remedial Actions:** Supervisors should have the appropriate tools and authority to require and enforce remedial actions when a bank is not compliant.
- **Cooperation:** Supervisors should cooperate with relevant authorities (including those in other jurisdictions) regarding the review and enforcement of the principles for internationally active banks.

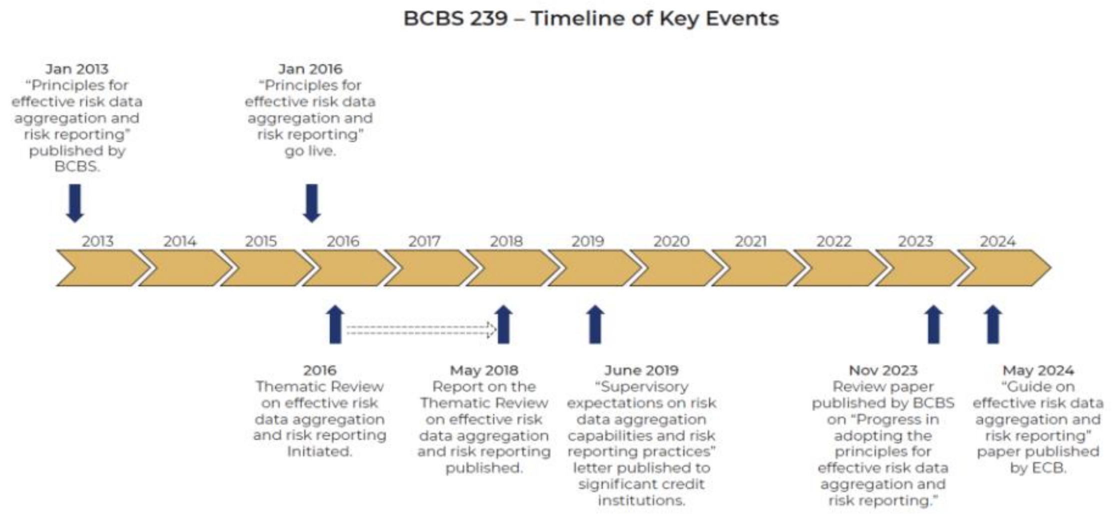


BCBS239 Principles Relations 8
Source: (Orgeldinger, 2018)

In May 2018 EBC published the "Report on the Thematic Review on effective risk data aggregation and risk reporting." where concluded that implementation status was unsatisfactory for most banks, with weaknesses mainly from a lack of clarity regarding responsibility.[27]

Following in June 2019, Andrea Enria Chairman of the Supervisory Board addressed a letter to the significant institutions highlighted supervisory expectations for "reliable data is a fundamental precondition for a comprehensive risk management and adequate decision-making" , the ICAAP/ILAAP deficiencies , the need for substantial and timely improvements in risk data and the following Supervisory Actions to evaluate the progress during the upcoming SREP assessment.[28]

The BCBS has periodically conducted a series of banks' progress on compliance with BCBS 239. In the most recent one in November 2023, the report provided an update on the progress made by 31 G-SIBs (Global Systemically Important Banks) in adopting the principles and revealed that most banks need to highlight further to become compliant with Committee's recommendations. The report demonstrated that becoming compliant with the BCBS 239 principles has proved difficult[29] and has not followed a straight line.[30]



[27] https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.BCBS_239_report_201805.pdf

[28] https://www.bankingsupervision.europa.eu/press/letterstobanks/shared/pdf/2019/ssm.supervisory_expectations_on_risk_data_aggregation_capabilities_and_risk_reporting_practices_201906.en.pdf

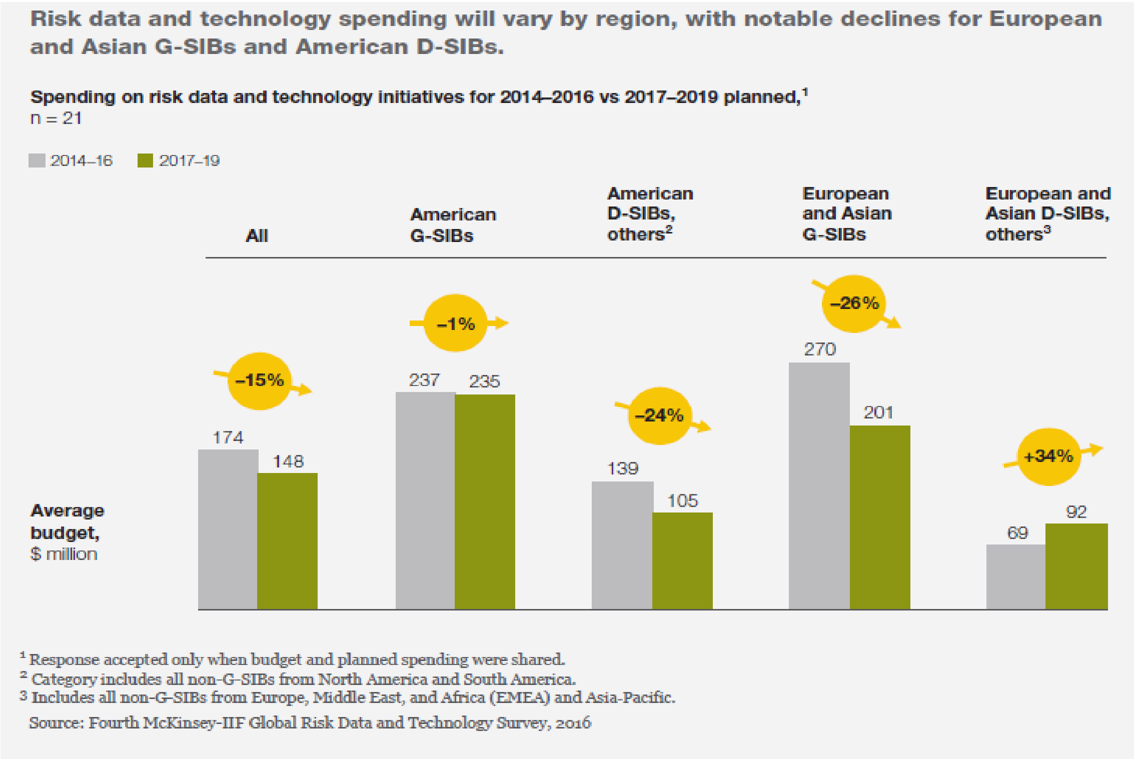
[29] https://eyfinancialservicesthoughtgallery.ie/bcbs-239-slow-and-steady-progress/

[30] https://rdarr.com/

BCBS239 Timeline of Key Events 9

Source: Treliant[31]

At the same time, during all those years from 2013 to 2023 various industry studies have also contributed to this feeling that BCBS 239 was a marathon than a sprint and strategic investments are needed to achieve compliance. Indicatively about 50 percent of G-SIBs were in the process of investing over USD 100 million.[32]



BCBS 239 Investments 10

Source: McKinsey & Company: Living with BCBS 239 (May 2017)[33]

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[31] https://www.treliant.com/knowledge-center/risk-data-aggregation-and-risk-reporting-where-did-it-all-go-wrong/

[32] https://www.mckinsey.com/capabilities/risk-and-resilience/our-insights/a-marathon-not-a-sprint-capturing-value-from-bcbs-239-and-beyond

[33] https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/Risk/Our%20Insights/Living%20with%20BCBS%20239/Living-with-BCBS-239.pdf

Other studies highlighted the advantages of BCBS 239 and the positive effect to embrace the fourteen principles.[34] (Orgeldinger, 2018) . Additional research has gone one step further revealed that master data management (MDM) and implementation challenges require careful attention due to technical and functional complexity.[35] (Martins, Mamede, & Correia, 2022)

Areas like data lineage and data quality was also in the core of the BCBS 239 scope as it was highlighted in KPMG's regulatory alert with focus on Data Management.[36] (KPMG, Heightened Risk Standards: Focus on Data Management (& BCBS 239), 2024)

Under this significant challenge in 2023, the ECB released a consultation paper[37] that laid out recommendations to improve BCBS 239 compliance[38]. The regulator raised relevant concerns on banks capabilities to manage BCBS 239, and as a remediation action ECB released in May 2024 a dedicated "Guide on Effective Risk Data Aggregation and Risk Reporting" (RDARR) to address them, building upon BCBS 239 principles looking forward to provide a roadmap on achieving compliance and highlight areas for upcoming supervisory inspections.[39]

The main components of the updated BCBS 239 approach consist of seven key areas of concern:

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34 https://www.researchgate.net/publication/327598641_The_Implementation_of_Basel_Committee_BCBS_239_Short_analysis_of_the_new_rules_for_Data_Management

35 https://www.sciencedirect.com/science/article/pii/S240584402200915X

36 https://kpmg.com/us/en/articles/2024/heightened-risk-standards-focus-on-data-risk-and-bcbs-239-reg-alert.html

37 https://www.bankingsupervision.europa.eu/framework/legal-framework/public-consultations/html/rdarr.en.html

38 https://www.bearingpoint.com/en/insights-events/insights/rdarr-bcbs-239-implementation-under-scrutiny/

39 https://www.treliant.com/knowledge-center/risk-data-aggregation-and-risk-reporting-where-did-it-all-go-wrong/

Responsibilities of the management body

The management body is responsible to oversee the implementation and delivery of the program as a key priority, provide adequate resourcing, approve the framework, and ensure knowledge and skills.[40] (Deloitte, BCBS 239 benchmark survey, 2024) (European Central Bank, Guide on effective risk data aggregation and risk reporting (RDARR), 2024)

Scope of application

RDARR requires an appropriate framework for identification, monitoring, managing, and reporting on risks. This framework should cover internal and external risk and financial reporting (including regulatory reporting) and should also include internal risk models and metrics linked to bank's risk appetite. (Deloitte, BCBS 239 benchmark survey, 2024) (European Central Bank, Guide on effective risk data aggregation and risk reporting (RDARR), 2024)

Effective data governance framework

The framework must set out roles and responsibilities, especially for data owners, a central data governance unit or function, a second line of defense (LoD) independent validation function, and involvement of the internal audit. (Deloitte, BCBS 239 benchmark survey, 2024) (European Central Bank, Guide on effective risk data aggregation and risk reporting (RDARR), 2024)

Integrated data architecture

Banks should have a robust data architecture that covers all metadata definitions, extensive data validation rules, and also up-to-date and complete data lineages. (Deloitte, BCBS 239 benchmark survey, 2024) (European Central Bank, Guide on effective risk data aggregation and risk reporting (RDARR), 2024)

Group-wide data quality management and standards.

Banks must ensure that data quality controls are monitored regularly, data quality issues are understood, addressed on time and remediated adequately, any manual processes or End User Computing are subject to regular review. (Deloitte, BCBS 239 benchmark survey,

[40] https://www.deloitte.com/lu/en/Industries/banking-capital-markets/research/bcbs-239-benchmark-survey-2024.html

2024) (European Central Bank, Guide on effective risk data aggregation and risk reporting (RDARR), 2024)

Timeliness of internal risk reporting

Risk reporting must be timely in terms of frequency and production, accurate and complete. (Deloitte, BCBS 239 benchmark survey, 2024) (European Central Bank, Guide on effective risk data aggregation and risk reporting (RDARR), 2024)

Effective implementation programs

Banks that deviate from BCBS 239 compliance should have a remediation plan which addresses the weaknesses. The ECB consists on setting a member of the Management Body responsible for the execution of the program. (Deloitte, BCBS 239 benchmark survey, 2024) (European Central Bank, Guide on effective risk data aggregation and risk reporting (RDARR), 2024)

While BCBS 239 answers to the "what" to be done, RDARR refers to the operational aspects of the implementation, answering the "how" to be done. Financial institutions now view RDARR not only as a compliance checkbox, but as a strategic asset with the purpose of managing financial risks, especially during times of crisis. In comparison BCBS 239 differs from RDARR into the following areas (Basel Committee on Banking Supervision, Principles for effective risk data aggregation and risk reporting (BCBS 239), 2013), (European Central Bank, Guide on effective risk data aggregation and risk reporting (RDARR), 2024):

Area	BCBS 239 (2013)	ECB Guide on RDARR (2024)
BoD oversight	• Oversight role, but ownership on management bodies • Awareness of RDARR in decision-making processes	• Stronger oversight/ monitoring and responsibility for definition and implementation of RDARR principles • Need for relevant knowledge and skills on RDARR
1st LoD	• Both Business and IT units have ownership of Data Quality	• Explicit description of Data Owners and Central Data Governance function as key actors: – Data owners responsible for Data Quality of elements in scope – Central Data Governance defines policies and oversees implementation

2nd LoD	• Responsibility for RDARR validation, overseeing correct application of policies and processes and alignment with risk profile of the Bank	• Explicit mention of Independent Validation function responsible to execute regular assessments of entire Data Governance Framework / RDARR processes (incl. overseeing projects and initiatives) and provide updates to Management Body
Scope and focus	• Limited scope: includes only the essential risk reports and risk metrics used for RDARR and risk management • Limited focus on Data Quality, mentioned only two times	• Extended scope: includes all material legal entities and business lines and covers wider perimeter of data, metrics, internal models, and reports (financial, supervisory) • Higher focus on Data Quality, mentioned forty-nine times
CDEs & Data Lineage	No explicit requirements for Data Lineage and no explicit mention to Critical Data Elements (CDEs)	Explicit mention that CDEs (also formally defined), and risk indicators should have clear and documented end-to-end data lineage

BCBS 239 vs RDARR 4

2.2.3 ECB Supervisory Priorities (2016–2028), focus on BCBS 239 & RDARR

On a periodic basis, i.e. every two to three years, the supervisory Board of the ECB sets priorities which reflect the vulnerabilities and risks for supervised entities. Following the various supervisory exercises, especially Supervisory Review and Evaluation Process (SREP) those reviews are updated to reflect a comprehensive assessment on major risks and to assess the previous years' compliance to regulatory requirements. (European Central Bank , Supervisory priorities and risks, n.d.)
In the following section we will present a historical analysis covering the period 2016 to 2028 focusing on BCBS 239 and RDARR concluded to the conclusion that fixing data issues in banks is a multi-year and sometimes multi-decade effort, requiring persistent supervisory attention.

Starting in 2016, the Single Supervisory Mechanism (SSM) recognized the need to place an emphatic priority on risk management due to low profitability. The monetary crisis revealed that bank management lacked the information needed to make sound decisions about the identified risks. The quality of data and its effective use began to create a need for modern

IT infrastructure, while the submission of risk-related data forced the SSM to announce that it would conduct a thematic review of banks' compliance regarding the effective collection of data and the submission of information on risks. (ECB Banking Supervision, SSM priorities 2016, n.d.)

In 2017, supervisory priorities focused on business models and profitability factors, along with credit risk with an emphasis on non-performing loans. Particular reference was made to the critical parameter of high data quality as a prerequisite for accurate information that will ultimately ensure the adequacy of capital requirements. (ECB Banking Supervision, SSM priorities 2017, n.d.)

The coronavirus pandemic (COVID-19) had a serious impact on the global economy in 2020. Risk monitoring remained a high priority in 2021 as vulnerabilities in the banking sector were identified. The assessment of key challenges revealed, among other things, shortcomings in the area of information systems for the timely detection of credit quality deterioration. Furthermore, the trend towards digital transformation paved the way for the reform of banking models in terms of information systems management and data quality management, highlighting the obligation to comply with the principles of BCBS 239. (ECB Banking Supervision, SSM priorities 2021, n.d.) (ECB Banking Supervision, The need for improved cyber resilience in euro area banks, n.d.)

The supervisory priorities for a three-year period 2022 to 2024 can achieve satisfactory progress in addressing the relevant vulnerabilities. Addressing the risks arising from climate change and environmental degradation will undoubtedly be one of the main challenges for banks and supervisory authorities. In 2023, ECB Banking Supervision conducted a climate stress test, requesting information and requiring preparations in terms of information systems and infrastructure to assess banks' progress in achieving this objective. (ECB Banking Supervision, SSM priorities 2022 - 2024, n.d.)

Russia's invasion of Ukraine had immediate macro-financial consequences on the development of the economy and the banking sector. Banks need to effectively address long-standing weaknesses and adequate and effective centralized data collection and risk reporting frameworks to support effective management guidance and meet supervisory expectations in times of crisis. Material deficiencies in these areas have been repeatedly identified in annual SREP exercises, as banks have made slow and insufficient progress in addressing gaps related to supervisory expectations and compliance with BCBS 239 principles. (ECB Banking Supervision, SSM priorities 2023 - 2025, n.d.)

For 2024 to 2026, the main shortcomings relate to inadequate diligence and oversight by administrative bodies, ineffective governance frameworks, weaknesses in data structure and fragmented unharmonized IT landscape. Strict prioritization by administrative bodies is crucial to address deficiencies related to risk data collection and reporting, which often requires significant resources. From 2024 onwards, a structured escalation mechanism will increasingly be applied, which will likely include enforcement measures and sanctions. (ECB Banking Supervision, SSM priorities 2024 - 2026, n.d.) (European Central Bank, Aggregated results of SREP 2023, n.d.)

It is clear that one of the main priorities for the coming years will be the centralized recording of risk data and the submission of relevant reports, shifting the supervisor's focus from risk identification to risk correction and strengthening RDARR capabilities to ensure timely decision-making and effective strategic guidance. Although considerable progress has been made, banks should intensify their efforts to fully comply with supervisory expectations and implement timely structured plans to address outstanding material deficiencies. (ECB Banking Supervision, SSM priorities 2025 - 2027, n.d.)

The Supervisory Board of the ECB has set as a priority for the period 2026-2028 the strengthening of the restoration of deficiencies in risk reporting capabilities and related information systems. The uncertain geopolitical environment and the rapid digital transformation of banks' activities and services underscore the need for resilient internal information systems and robust RDARR capabilities. In addition, banks are given the opportunity to leverage digital transformation tools and technologies, such as artificial intelligence and advanced analytics. On-site inspections and targeted assessments of RDARR frameworks in 2024 revealed weaknesses in banks, specifically: poor internal governance frameworks, including inadequate involvement of management bodies, data infrastructure and IT architecture, and lack in the accuracy and integrity of their data.

The 2024 targeted assessments also revealed gaps in relation to the principles of BCBS 239 and the relevant supervisory expectations arising from the faithful implementation of RDARR. (ECB Banking Supervision, SSM priorities 2026 - 2028, n.d.) (European Central Bank, Sound risk data reporting key to better decision-making and resilience, 2025)

Francisco Garcia-Martin presented a critical position on the question: "Why is data quality and aggregation important?"

Most of the time, RDARR is treated as a simple supervisory requirement, and the emphasis is placed on the quality of the report that banks will submit to the supervisor. However, data quality and effective data collection are a strategic advantage because:

- You can understand your exposure to the various risks you face and direct your actions accordingly.
- You are prepared and flexible to assess the impact of consequences and react in a timely manner.
- You have an advantage in implementing innovative technologies such as Artificial Intelligence and advanced analytics.

The results of the on-site inspections showed delays in implementation despite expanding banking supervision. There are multiple reasons for this, with the most important following:

- Shortcomings in the governance framework for the implementation of RDARR
- Fragmented systems
- Many manual procedures related to data production and reports processing
- Implementations are costly, time-consuming, and involve substantial risk

The conditions call for a different approach and response to the acceptance of the principles of BCBS 239 and RDARR, adopting effective practices in the areas of internal governance, data infrastructure, and IT architecture, and ensuring accuracy and integrity for data and the production of risk reports. (Martin, 2025) (European Central Bank, Sound risk data reporting key to better decision-making and resilience, 2025)

2.3 Studies on data governance and regulatory compliance

Today, with the volume of information managed by banks having increased exponentially and the need to report to supervisory authorities and the central bank having become a daily and painful process, banking institutions have recognized the valuable importance of maintaining the quality of the data they manage. (Gluchowski & Kreiterling, 2021).

In this chapter, we will examine data governance from the perspective of different models and trends in the industry. In the second part, we will refer to the criticality of compliance with supervisory requirements, as set out by the BCBS 239 and RDARR authorities, and we will refer to the recommendations for achieving this regulatory obligation.

2.3.1 Definition of data governance

One of the key challenges facing organizations is to devise and implement mechanisms and practices that give them effective control over the data they manage.

There are several definitions of data governance:

MDM institute defines data governance as: “the formal orchestration of people, processes and technology to enable an organization to leverage data as an enterprise asset.” (The MDM Institute, 2004)

Robert Seiner Definitions from “Non-Invasive Data Governance” publication (Seiner, Non-Invasive Data Governance, 2014): “Data governance is the formal execution and enforcement of authority over the management of data and data related assets.”

DAMA-DMBOK definition: "...the exercise of authority and control (planning, monitoring, and enforcement) over the management of data assets." (DAMA International, n.d.)

Data Governance framework is the organizational structure that defines the strategy, rules, processes, and responsibilities for the effective management of business data in an organization. It orchestrates policies and procedures that determine who has access to data, how it is used, who is responsible for managing it, and how its accuracy, completeness, and reliability are ensured. In addition, Data Governance includes monitoring and evaluating the organization's performance in terms of data management and taking measures to improve it. (Kosinski & Holdsworth, n.d.)

Data Governance framework is an operating model that empowers teams and aligns daily workflows to business outcomes seeking maximization of business value. (Winks, 2025)

2.3.2 Data Management vs. Data Governance

They are not the same, although the terms are often used interchangeably (Iusov, n.d.), because they serve different purposes but together weakens decision making and execution.

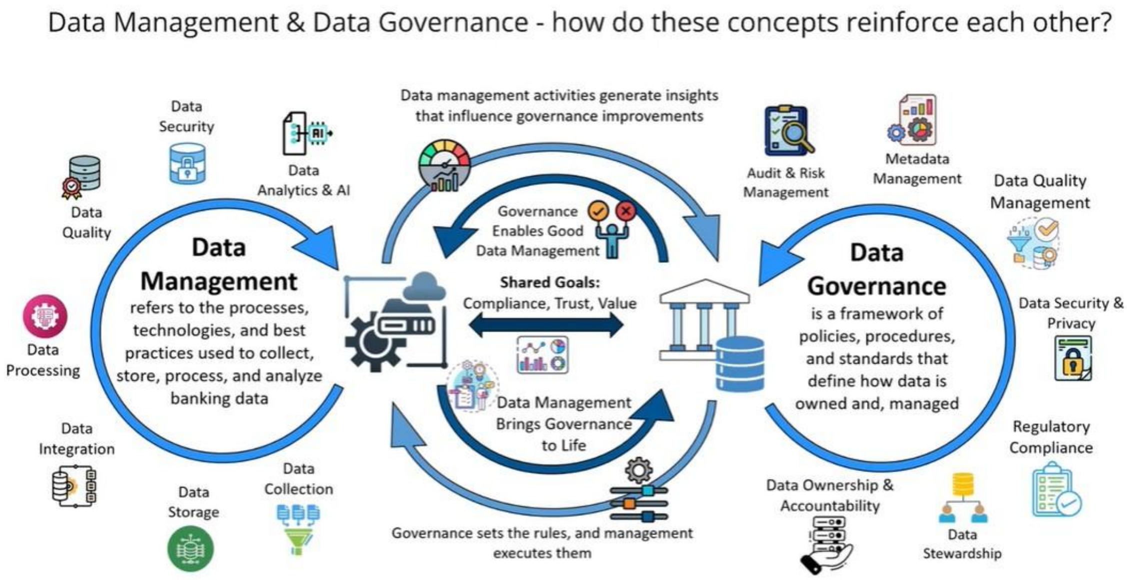
Data management describes how data is created, stored, protected, used, and retired. Its purpose is to turn data into a usable enterprise asset. The main attributes of data management are (Oracle, Best Practices in Data Governance, 2011):

- Data architecture and modelling
- Data lineage
- Data quality and data integration
- Storage, security, and operations
- Analytics, Business Intelligence (BI)

On the other hand, Data Governance role defines authority, who controls data, accountability and decision making. It sets the rules for how data should be managed. In particular it focuses on (Oracle, Best Practices in Data Governance, 2011):

- Policies and standards and metadata management
- Decision rights
- Data ownership and stewardship
- Compliance and ethical use
- Data quality management

The key differences are actual daily execution versus decision making and guidance and in contrast Data management answers the question “How is data managed?” while Data Governance asks:” Who decides and under what rules?”
Data governance provides direction and Data management puts direction into actionable results. (Hahne, n.d.) (Iusov, n.d.)



Data governance vs Data management 11
Source: Data Management & Data Governance in Banking [41] [42]

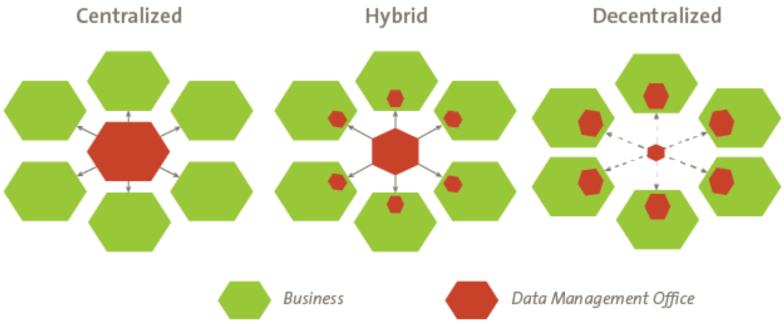
A significant addition to the above Data Governance attributes is the work from Robert S. Seiner, author of Non-Invasive Data Governance book series (Seiner, Non-Invasive Data Governance, 2014) who is highlighting: “Data governance cannot exist without change management.” (Seiner, Data Governance Must Include Change Management, 2025). Organizations struggle with over-complicated or sometimes ineffective implementations, boards and practitioners struggle between compliance and actual use of data assets. Organizations need to reset how they manage and use information under the transitions their workforce is facing from AI use and automation. (Ladley & Seiner, 2025)

2.3.3 Data Governance models

For the implementation of all data governance tasks, we can distinguish three basic models that management teams choose to adopt depending on their needs and objectives.

[41] https://www.youtube.com/watch?v=IBE05i5Ai7w

[42] https://www.udemy.com/course/data-management-banking-101/?referralCode=356DE843BEAE7DF8107F



Data Governance models 12
Source: Data Management activities[43]

Centralized

In this model, the organization must create a central Data Governance team, which is responsible for managing the policy and framework across the board. This team reports to the bank's management and is responsible for all actions that need to be taken. This model is now less common and is found in smaller organizations. (Van der Staaij & Tegelaar, 2017)

Decentralized

Here, the various teams within the organization take internal responsibility for managing data in their own areas. This model can be implemented very quickly without changing the organizational chart, but coordination is exceedingly difficult and it is logical that over time the initial goal of data governance will be lost. This option is used when organizations do not want to radically change their organizational structure and want to quickly integrate a functional data governance framework with minor interventions. (Van der Staaij & Tegelaar, 2017)

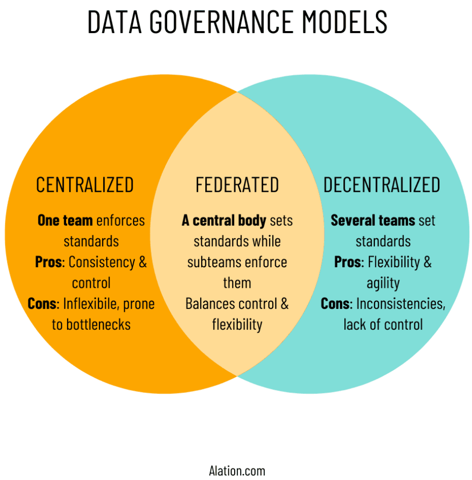
Hybrid or Federated

The hybrid model combines the best elements of the previous models, i.e., there is a central data governance team responsible for the company's overall data governance strategy, but decisions on data management in their area are made by decentralized teams within the organization. We see that the hybrid model has been the most frequently and successfully

[43] https://www.compact.nl/articles/data-management-activities/

implemented in organizations to date, as it has the flexibility and expertise needed to achieve its goals. (Van der Staaij & Tegelaar, 2017)

The choice of model with which an organization will adopt data governance is of strategic importance and influences future actions regarding its implementation. Although the philosophy of data governance is decentralized and diffused throughout the organization regardless of which of the above models is adopted, strategies must be decided by senior management and in line with the broader corporate objectives. (Alation, Understand These Data Governance Models: Centralized, Decentralized, and Federated, 2025)



Data Governance models 13
Source: Understand Data Governance Models[44]

2.3.4 Data Governance Frameworks

Data Management Body of Knowledge (DMBOK)

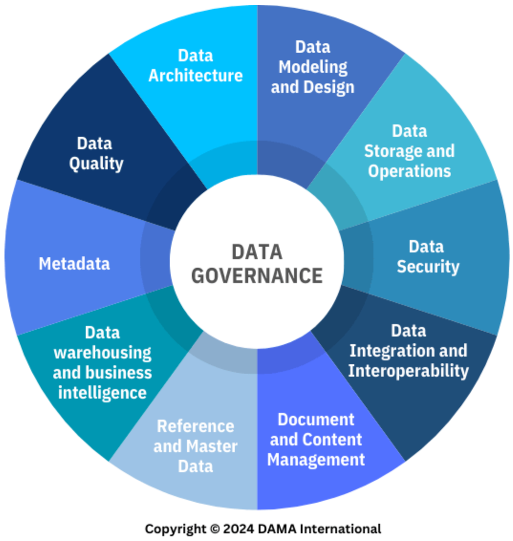
DAMA-DMBOK (Data Management Body of Knowledge) is a set of best practices for data management that are recommended for implementation in any organization. It was created by the International Data Management Council (DAMA International) and is a valuable tool for data management professionals. It provides the necessary guidance for activities that

[44] https://www.alation.com/blog/understand-data-governance-models-centralized-decentralized-federated/

must be performed or taken into account regardless of the organization's sector and is a tool that can be used by banks to develop and improve data management practices, enabling them to make better use of their data to achieve their business objectives.

The DAMA wheel is one of the most known models because it provides a straightforward way to present the eleven areas that combined create a complete data management function. At the centre of the wheel stands data governance as the coordinator of all other areas. Its role is to provide the direction and guidance needed to control everything else in a consistent and balanced way.

Focusing on the financial institutions sector, some specific areas of interest like data quality and metadata management hold a significant role. (DAMA International, n.d.)



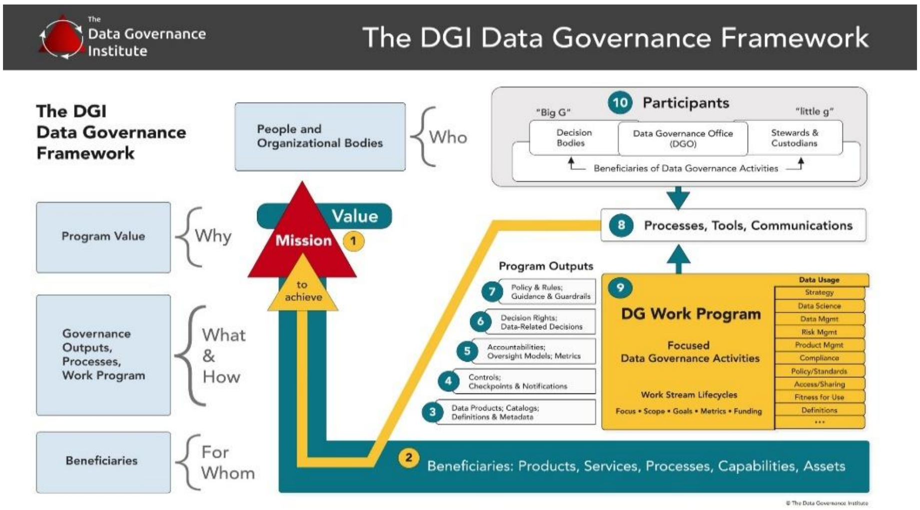
Dama DMBOK 14
Source: DAMA-DMBOK[45]

Data Governance Institute Framework (DGI)

This framework founded in 2003 describes ten universal components that every implementation will include to some extent. Those components can be organized under four categories WHY you need that program, WHAT is the program consists, WHO is involved

[45] https://dama.org/dmbok2r-infographics/

and HOW processes add value. (Data Governance Institute, 2003) (Ekundayo & Chinoperekweyi, 2023)



Data Governance Institute Framework 15
Source: The DGI Data Governance Framework[46]

McKinsey's data governance model

Consisting of a central data governance/management office (DGO/ DMO) lead by a CDO and other governance leaders who provide the standards and directions. A data council acting as the liaison between DGO and data domain managers, connecting data strategy with the corporate strategy. And finally, domain roles assigned to data managers for the day-to-day implementation responsible for data quality in their domain. (McKinsey, Designing data governance that delivers value, 2020)

McKinsey's data governance model 16
Source : McKinsey's data governance model[47]

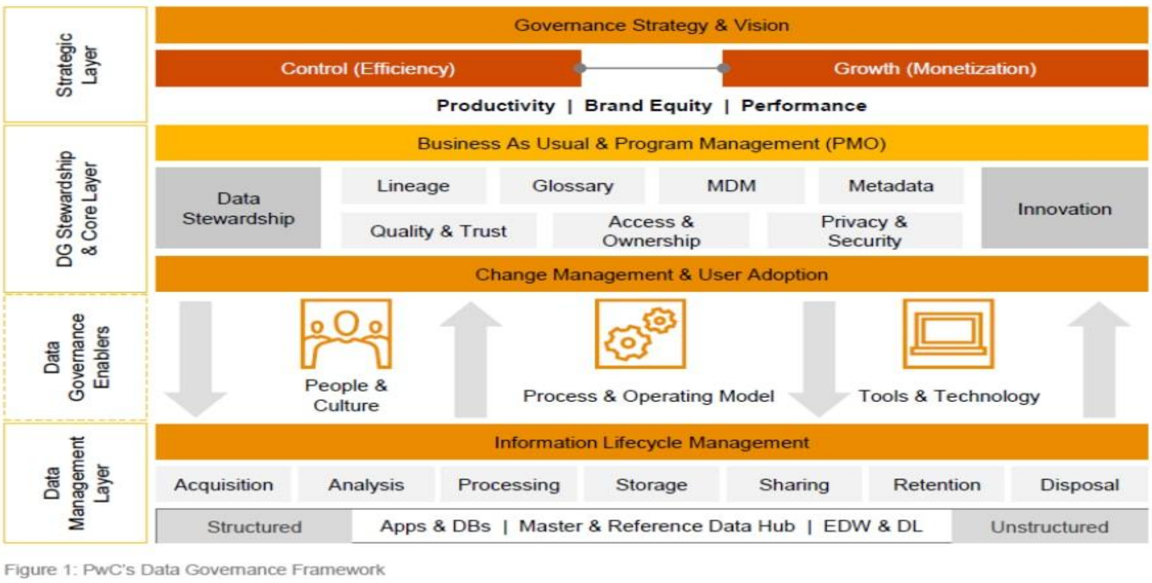
[46] https://datagovernance.com/the-dgi-data-governance-framework/dgi-data-governance-framework-components/

[47] https://www.mckinsey.com/capabilities/tech-and-ai/our-insights/designing-data-governance-that-delivers-value#/

PwC's enterprise data governance framework

This model comprises of five key components:

Data governance strategy defining business goals and corresponding performance metrics to monitor implementation performance. Enterprise data management landscape as data architecture, data models, metadata management etc. Data lifecycle management for data processes, business strategies and technologies used. Data stewardship acts as a core area for the successful execution of the program and Key performance indicators (KPIs) should be established to measure the program. Finally, Data governance enablers reflect three pillars of the program – people and culture, processes and operating model and technology and tools used. (PWC, 2019)



PwC's enterprise data governance framework 17

Source : PwC's enterprise data governance framework[48]

2.3.5 Compliance definition and importance

When it comes to corporate governance, compliance can be defined as any action you perform to ensure that you operate in accordance with the assigned expectations. Compliance has many forms (financial, data related, environmental etc.) and it comes from stakeholders, regulators, governments. (Byrne, n.d.)

[48] https://www.pwc.in/consulting/technology/data-and-analytics/govern-your-data/insights/global-and-industry-frameworks-for-data-governance.html

Regulatory frameworks ensure organizations adhere to standards that safeguard financial stability and consumer protection with the adoption of technologies, policies, rules etc. Failure to comply can result in severe penalties, including fines and reputational damage (ECB Banking Supervision, ECB sanctions Goldman Sachs Bank Europe for misreporting capital needs, 2023), so regulatory adherence is a top priority for financial institutions. (McCaul & ECB Banking supervision, 2024)

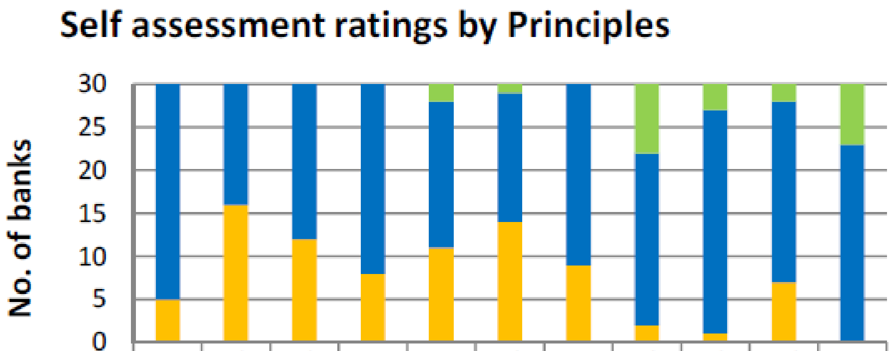
The ECB is raising supervisory expectations and is increasing efforts to address ongoing weaknesses in RDARR, an area where many banks still show persistent weaknesses. Banks are expected to strengthen their governance and timely deliver appropriate corrective actions, while supervisor is increasingly establish escalation mechanisms and qualitative measures to ensure effective oversight. (McCaul & ECB Banking supervision, 2024)

SSM's top supervisory priorities since 2017 was the compliance with the BCBS principles and banks are requested to consistently apply BCBS 239 principles not only for internal risk data purposes, but also in their financial reporting, supervisory reporting and public disclosures. (Poloni, 2024) (McKinsey, A marathon, not a sprint: Capturing value from BCBS 239 and beyond, 2015)

2.3.6 Seeking BCBS 239 and RDARR compliance.

At the initial stages of BCBS 239 only the G-SIBs were considered as eligible to implement BCBS 239 principles as best practices for improving their Risk Data Aggregation & Reporting Practices were not in place. The 2013 review[49] was in the form of a self-assessment, in which each participating bank answered eighty-seven questions/requirements for eleven principles with each principle ranging in compliance status from 4 (best) to 1 (worst). The average rating was 2.8, with the principles dealing with data architecture and IT infrastructure, accuracy and integrity receiving the lowest levels of compliance. (Mani, 2015) (Basel Committee on Banking Supervision, Progress in adopting the principles for effective risk data aggregation and risk reporting, 2013)

[49] https://www.bis.org/publ/bcbs268.htm



	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
Fully compliant	0	0	0	0	2	1	0	8	3	2	7
Largely compliant	25	14	18	22	17	15	21	20	26	21	23
Materially non-compliant	5	16	12	8	11	14	9	2	1	7	0
Non-compliant	0	0	0	0	0	0	0	0	0	0	0
Average rating	2.8	2.5	2.6	2.7	2.7	2.6	2.7	3.2	3.1	2.8	3.2
	Governance/ infrastructure		Risk data aggregation capabilities				Risk reporting practices				

Self assessment ratings by principles 18

Source: Progress in adopting the principles for effective risk data aggregation and risk reporting 2013[50]

A recent post from Zengines[51] refers that most banks score below 70% against regulatory expectations and that only 6.5% of banks are fully compliant with BCBS-239. The main reason identified during fire drills is data lineage. (Zengines, 2025)

From 2013 onwards and by the most recent review in 2023 (Basel Committee on Banking Supervision, Progress in adopting the Principles for effective risk data aggregation and risk reporting, 2023) every known consulting firm have created white papers and made suggestions on how banks will be able to comply with those principles. My review revealed countless web sites and resources which are not possible to present at this thesis. Below we can see the key compliance challenges and the main suggestions in the form of matrix covering the most significant ones.

[50] https://www.bis.org/publ/bcbs268.htm

[51] https://www.linkedin.com/company/zengines/posts/?feedView=all

Key compliance challenges

- Resistance to Transformation.
    - Lacking strong leadership, resulting in lean compliance efforts
    - Resource shortages and underfunding for risk data management.
- Unclear definitions and inconsistency
    - Discrepancies in BCBS interpretation
- Excessive resource allocation
    - Struggle to allocate time and manpower to manual processes.
    - Lack of automation
- Fragmented IT landscape
    - Outdated IT systems and data silos affect timely reporting.
    - Legacy systems (Excels, old databases etc.) and manual processes increase errors.
    - The term "data lineage" does not mentioned in regulatory documents but it is considered as a key challenge to meet these requirements. (Steenbeek, 2019)
    - Poor metadata
- Regulatory pressure and evolution
    - ECB increases scrunity and compliance standards (Knedelstorfer & Beck, 2024)
    - Increased Compliance Costs (Linsley, 2024)
- Manual Reconciliation and reporting
    - Severe inconsistencies and errors
    - Difficult to maintain End User Computing (EUC) solutions (Rivoire, 2024)

Main suggestions

- Foster leadership engagement to drive a cultural shift.
- Establishing robust data governance framework with Clear ownership at domain and enterprise levels. Formalize data stewardship and document policies for metadata, definitions, and controls.
- Implement organization wide guidelines to interpret BCBS 239 principles with clarity and consistency. Develop training courses and seek feedback.

- Automate data processes to reduce resource burden, reduce manual entries.
- Invest in integrated IT infrastructures and eliminate data silos considering a significant gain in reducing operational costs associated with fragmented systems.
- Defined quality indicators to monitor established data quality controls. Enhance data quality controls with automated validation rules and establish root-cause analysis for recurring issues.
- Create a data catalog as a centralized inventory of data assets providing transparency into the lineage of all data used for risk management in support of BCBS 239.
- Create adequate data lineage documentation it is the key to identifying critical data elements or all-risk indicators and metrics within the scope of application. Establish root cause analysis to identify errors by tracing back data journey to its source.
- Adapt proactively to evolving regulatory requirements and improve their internal decision-making processes. Allocate significant resources to meet regulatory requirements such as increased reporting, auditing, and monitoring third-party.
- Automate reconciliations for reporting to enhance data accuracy and reliability and reduce manual intervention.

(McKinsey, BCBS 239 2.0 resurgence: Strengthening risk management and decision making, 2024) (Consultancy.eu, 2024) (OvalEdge, How to Achieve BCBS 239 Compliance: A Step-by-Step Roadmap, 2025) (OvalEdge, BCBS 239 Requirements: Essential Compliance Steps for 2026, 2026) (Solidatus, 2025) (Yaptak & Billigence, 2025) (Ataccama, 2025) (KPMG, Heightened Risk Standards: Focus on Data Management (& BCBS 239), 2024) (Oliver Wyman, 2024) (Alation, What Is BCBS 239? Your 2025 Guide, 2024) (Informatica, 2025) (Deloitte, Data lineage: Data origination and where it moves over time, 2023) (Martins, Mamede, & Correia, 2022) (KPMG, Ten Key Regulatory Challenges of 2024: Mid-year Look Forward, 2024) (Oracle, Take Action to Ensure Compliance and Deliver a Competitive Advantage, 2014) (McKinsey, Living with BCBS 239, 2017) (Ernst & Young Associates, 2025)

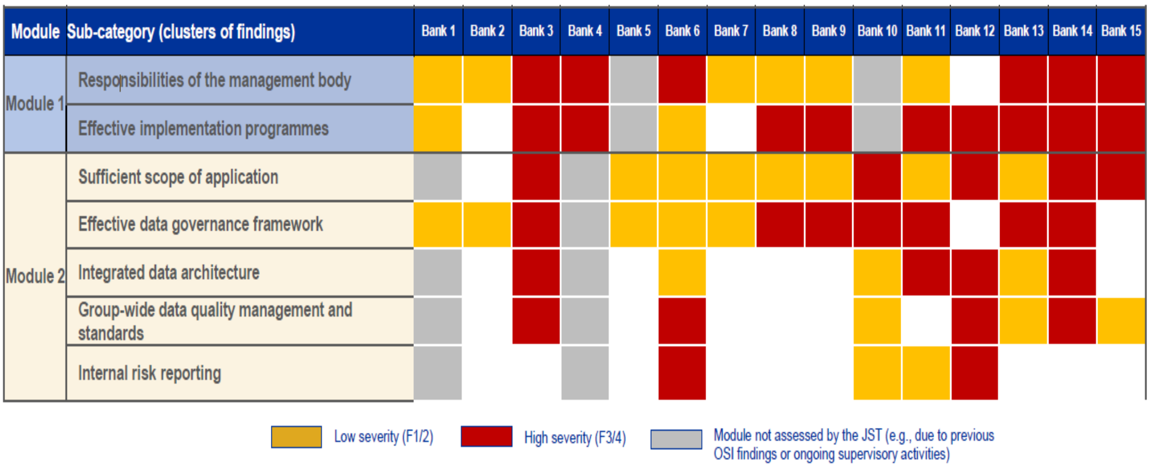
A year after EBC published the RDARR guide in May 2024 (European Central Bank, Guide on effective risk data aggregation and risk reporting (RDARR), 2024) , and following the On Site Inspections (OSI) from banking authorities everyone realized that the core essence of the RDARR compliance have shifted to a more elementary issues.

According to the OSI campaign the main findings reveal that banks are facing significant gaps in meeting expectations and they do not cover the entire process from data capture to final reporting while implementation target dates are failing repeatedly.

(European Central Bank, Sound risk data reporting key to better decision-making and resilience, 2025) (Martin, 2025):

- Insufficient attention to RDAR from management board
- Too narrow scope of application
- Incomplete governance arrangements
- Data infrastructure and IT architecture do not fit for purpose.
- Insufficient data lineage and data taxonomies
- Data ownership inappropriately assigned.
- Recurrent manual data corrections due to issues with data quality controls
- Weakly controls of manual workarounds

The table below shows clusters of findings against the main aspects of the supervisory expectations in the ECB guide.



RDARR as a priority 19
Source: RDARR as a priority[52]

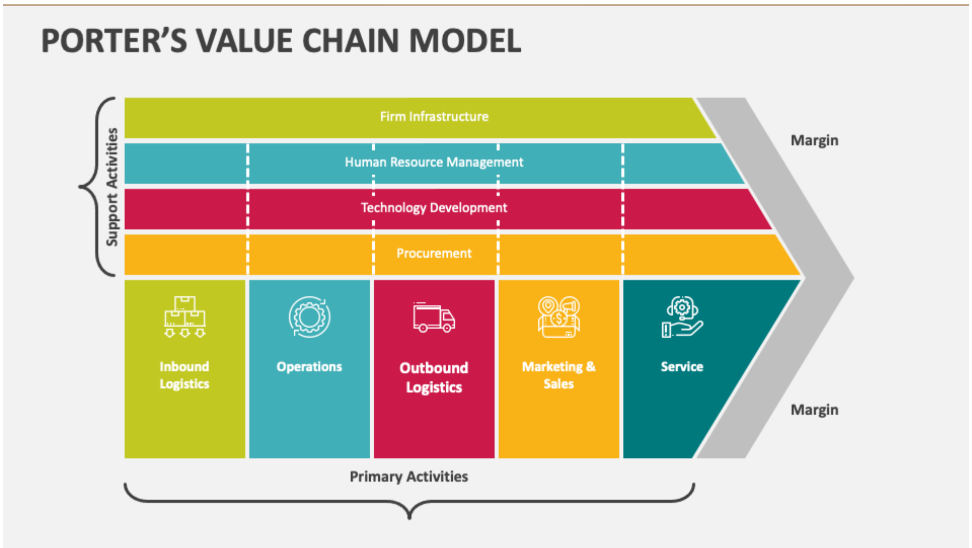
52 https://www.bankingsupervision.europa.eu/press/conferences/html/20250515_Supervisory_reporting.en.html

The ECB aims to ensure consistent follow-up and track tangible improvements and sufficient implementation. RDARR capabilities are crucial for sound decision-making and effective risk management. Institutions that unlock the full potential of these capabilities could gain a competitive advantage, enhance operational efficiency, and increase their resilience. (Martin, 2025)

3. The role of data governance in value creation

According to Porter (Porter, 1985) a value chain is a string of collaborating players who work together to increase the value of a product or service throughout the product or service lifecycle such as determination of customer needs, production, distribution, marketing and after sales service.

Porter's value-chain focuses on systems and how inputs are changed into the output. Using this viewpoint Porter described a chain of activities that are common to all businesses and he divided them into two types of activities. Primary activities and support activities, as it is illustrated in the below figure. Primary activities they are related to the physical creation, sale maintenance and support of a product or service. Support activities support the primary activities ensuring that the primary value chain activities operate effectively and efficiently.



Porter's Value Chain Model 20

Below is a Porter's Value Chain equivalence for data governance and data management operations. (Jin, 2026)

Inbound Logistics → Data Intake
This is where data is capturing and enters the organization. In this stage data governance becomes crucial, through enforceable rules, because if poor data enters freely no subsequent control can correct them.

Operations → Processing & Transformation
Most data teams' effort consumes in this stage and governance failures appears most often due to changes without approval and lack of impact analysis.

Outbound Logistics → Distribution
Here the data are available for consumption, but governance involves release discipline otherwise they are not guaranteed.

Marketing & Sales → Adoption & Enablement
The consumer's expectation is that data are trusted because technical pipelines are correct. The reality is that this is an underdeveloped area in data organizations due to unclear business definitions, lack of documentation and most important inactive user enablement. Consumers' trust is undermined if they don't understand their data or the implications of incorrect data.

Services → Support, Incidents, Escalation
This is the stage where incidents turn into a negotiation because there is a lack of clarity regarding ownership, remediation actions priority, escalation paths and tolerance level on fixes.

Firm Infrastructure → Data Governance & Operating Model
Data governance is the operating model on how decisions are made and enforced during execution.
This defines activities like priorities set, conflicts resolution, risk acceptance level and errors escalation paths. It also answers questions such as authority for changes approval, level of acceptable quality.

Human Resource Management → Data People & Skills
This stage is crucial in the sense that defines who can execute decisions while allocating the appropriate capabilities thought out the value chain.
Ownership with extensive decision rights, accountability at each stage with clear authority for the implemented solutions. Responsibility for operations execution and operations support aligned to specific stages of the value chain.

Technology Development → Data Platform & Tooling
The tools enforce the operation model because using the right tools for the right goals quality checks cannot be omitted end, they expose the risky paths leaving aside the dangerous ones and reveal the correct ones.

Procurement → Data & Vendor Management
In data operations, procurement is a strategy involving risk, leverage and dependency. It defines the dependence on vendors and under what conditions, the outsourced level of risks in order to reduce dependency risks.

The real value of data is emerging when it enables business decisions and actions to be executed with reduced risk, confidence and speed, otherwise it is just an inventory. This is important because it alters the location of value within the data lifecycle. Additionally, if no decision depends on it, the data has not value. Generally, data value is not created at the ingestion stage, it is realized at the consumption stage where the data is used. If the decision effects revenue or cost the organization measures the outcome in monetization terms.

The possibility that data fails to support a decision, due to quality errors, timeliness constrains or even meaning discrepancies increases risk about potential arise incidents since risk describes likelihood and not necessarily impact. Defining data value in operational terms actually answers the question: 'What would you lose if your data failed?' “. If your data fails to support your decisions, the consequences could be liquidity mishandling, audit and compliance issues, potential delayed or wrong investment decisions, and a loss of executive members trust in forecasts.

A critical path in the value chain plays the ownership assignment. A key question is to whom the organizations assign ownership to. The majority of financial institutions assign ownership to data assets or data pipelines. However, we know that value lies in decisions and the outcomes. Ownership has true value when it is anchored in the supported decisions and the consequences when those decisions are late or even wrong. In this sense the ownership comes from the accountability about the decision this data supports and the answer is pretty obvious. The owner is the person who feels the consequences. The value owner in most cases is a business, or compliance owner not a data or even operational role.

Controls play a vital role in any data governance framework with regard to the value chain. If they are misaligned and reactive, the true value lies in transforming them into proactive and enforceable controls. Those actions prevent teams arguing about process and start protect execution and force justifiable decisions. Controls are protecting value and cannot be detached from consequence because they exist to ensure reliable decision-making.

CFOs do care about lowering operational costs, improving profitability, diminishing risks. In those terms Data governance is underestimated since it is one of the highest returns on investment (ROI) components of digital transformation. Its benefits are intangible, spread across departments, and realized in the long run. In the era of AI measuring the ROI of a Data Governance program is important as a strategic investment. It provides a clear picture on the organization’s overall success, justifying the resources allocated to these initiatives.

Data governance is a business accelerator and when data is governed properly:

- Companies benefit from reduced operational costs and improved operational efficiency
- Compliance and Regulatory risks are lower
- Projects deliverables are faster and more accurate
- Decision accuracy is increasing and the tangible return is higher

- Customer trust is ensured regarding data privacy

Data governance importance is not only just about compliance or an obligation for cleaning messy datasets. It is a practical framework that connects data with decisions, delivers accountability and trust and can be measured in both financial and operational terms.

4. Methodology and analysis of findings

In the following section the design and results of the research will be presented, starting from the methodology used for collecting, processing and analyzing the data in order to answer the primary research question of this thesis is: "Do regulatory requirements and specifically RDARR compliance act as a change management process?"

4.1 Research approach

The study adopted a mixed-methods approach, combining quantitative and qualitative techniques to provide a holistic understanding of the role of regulatory requirements as a change management process in the banking industry.

Quantitative methods used in the form of a survey to measure the extent of compliance, resource allocation, and perceived effectiveness of change management initiatives. The survey conducted across various functional levels (Risk, IT, Finance, Compliance) within major Greek banking institutions to gauge individual perception regarding the familiarity and involvement on the RDARR program focusing on cultural shift, program awareness, technological adoption, providing data suitable for quantitative analysis using the Kotter's 8-step model. The questionnaire carried out from 8th February 2026 to 18th March 2026 and distributed to employees using Microsoft Forms. The final sample of the survey consists of 190 banking employees across all Greek banks and is suitable for statistical analysis. Survey questions are presented in Appendix A.

Qualitative methods will capture in-depth insights into organizational, cultural, and strategic aspects of RDARR implementation. Semi-structured interviews conducted with key stakeholders (e.g., risk managers, data governance officers, compliance officers, and IT executives) to understand organizational and cultural impact. These qualitative interviews will gather strategic perspectives on how the management body interpreted the mandate, prioritized the program, restructured governance, and managed cultural resistance. Six interviewees with distinct roles and responsibilities involved in the strategy implementation of the RDARR program were participated from the XYZ bank.

Interviewee	Position in the implementation process
1	Steering Committee Member
2	Regulatory Affairs Manager
3	Data Domain Manager
4	Data Validation Unit Manager
5	Credit Risk Manager
6	Project Office Manager

List of Interviewees roles 5

All interviewees are part of the RDARR strategy implementation in one way or another and were selected for their role differentiation and responsibilities regarding strategy implementation. The researcher found it important to select interviewees that had diverse perspectives on the specific knowledge area.

Interview questions are presented in Appendix B.

4.1.1 Ethical Considerations

- Consent was obtained from all participants prior to conducting the interviews.
- Confidentiality and anonymity are maintained.
- All data will be stored securely and used solely for academic purposes.
- Survey data were anonymized to protect confidentiality.
- All interviews were separately carried out in private Microsoft Teams sessions and were recorded with the approval of the interviewees.
- All interview recordings will be deleted after the interviews are analyzed.

4.1.2 Limitations

Access to senior executives was restricted due to time limitations. Interviews were context-specific to a major Greek bank and was not generalizable to other financial institutions. All interviews conducted in Greek language and Microsoft Teams and Microsoft Word transcription capabilities were used along with Greek to English dictionaries and DeepL Translator[53] for translation.

[53] https://www.deepl.com/en/translator

4.2 Quantitative Data Analysis

One of the research tools selected for this study is a questionnaire comprising by 8 demographic questions and 30 closed-ended questions using a 5-point Likert scale (Strongly disagree, Disagree, "Neither agree nor disagree", Agree, Strongly Agree), which were grouped into 8 categories aligned to Kotter's 8-step model. The Likert scale was chosen because it provides a deeper understanding of participants' experiences and perceptions than simple yes/no questions.

Guidelines from Harry N. Boone, Jr. and Deborah A. Boone were also followed regarding Suggested Data Analysis Procedures for Likert-Type and Likert Scale Data (Boone & Boone, 2012). All statistical analyses were performed using the SAS On Demand for Academics software.[54]

The following section presents an overview of the demographic characteristics.

4.2.1 Descriptive statistics from the Questionnaire

The study has an equal proportion of male and female participants.

Gender	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Female	91	47,89	91	47,89
Male	99	52,11	190	100

Gender descriptive statistics 6

Age groups were well distributed, with 45–54 the largest (42.63%).

Age	Frequency	Percent	Cumulative Frequency	Cumulative Percent
<35	18	9,47	18	9,47
35 - 44	66	34,74	84	44,21
45 - 54	81	42,63	165	86,84
>55	25	13,16	190	100

Age descriptive statistics 7

Very high education level among participants (72% with Master's).

Educational level	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Secondary Education	9	4,74	9	4,74
Bachelor's degree	41	21,58	50	26,32
Master's degree	136	71,58	186	97,89
PhD	4	2,11	190	100

[54] https://welcome.oda.sas.com/

Education descriptive statistics 8

The majority of employees have more than 20 years of experience (52.63%)

Years of working experience	Frequency	Percent	Cumulative Frequency	Cumulative Percent
<=5	11	5,79	11	5,79
6-10	17	8,95	28	14,74
11-15	24	12,63	52	27,37
16-20	38	20	90	47,37
>20	100	52,63	190	100

Employment descriptive statistics 9

Level Of Responsibility	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Employee / Officer	59	31,05	59	31,05
Manager / Director	125	65,79	184	96,84
Executive	3	1,58	187	98,42
Other	3	1,58	190	100

Responsibility level descriptive statistics 10

There is a strong representation from Risk Management and Technology (60%), with substantial Finance (12.11%) participation.

Current position	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Human Resources	3	1,58	3	1,58
Corporate or Private Banking / Wealth Management	8	4,21	11	5,79
Distribution Networks / Retail Banking	11	5,79	22	11,58
Financial Management	23	12,11	45	23,69
Other	31	16,32	76	40,01
Risk Management	54	28,42	130	68,43
Technology, Support & Operations	60	31,58	190	100

Department descriptive statistics 11

RDARR familiarity was high (87.37%), and 62.63% had direct project participation.

Familiarity with RDARR	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	24	12,63	24	12,63
Yes	166	87,37	190	100

RDARR familiarity descriptive statistics 12

Participation in RDARR Project	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	71	37,37	71	37,37
Yes	119	62,63	190	100

RDARR participation descriptive statistics 13

4.2.2 Likert distribution statistics

The chart below displays the percentage distribution (%) of responses to Likert questions, ranging from “Strongly Disagree” (dark red) to “Strongly Agree” (dark green).

Questions Q1, Q2 and Q3 have a strong percentage of Agree and Strongly agree categories (combined together), indicating that the "Establishing Urgency" phase was highly successful.

The management coalition and the RDARR vision also have a high acceptance rate (above 60%), suggesting that employees are aligned with the strategic nature of the requirement, but further improvement is needed.

The “Communication”, "Empowering Action" and "Short-term Wins" has a significant portion of "Neutral" responses (yellow) and the red/neutral bars widen significantly. This suggests that while employees understood the "Why" (Urgency), they were more hesitant about the "How".

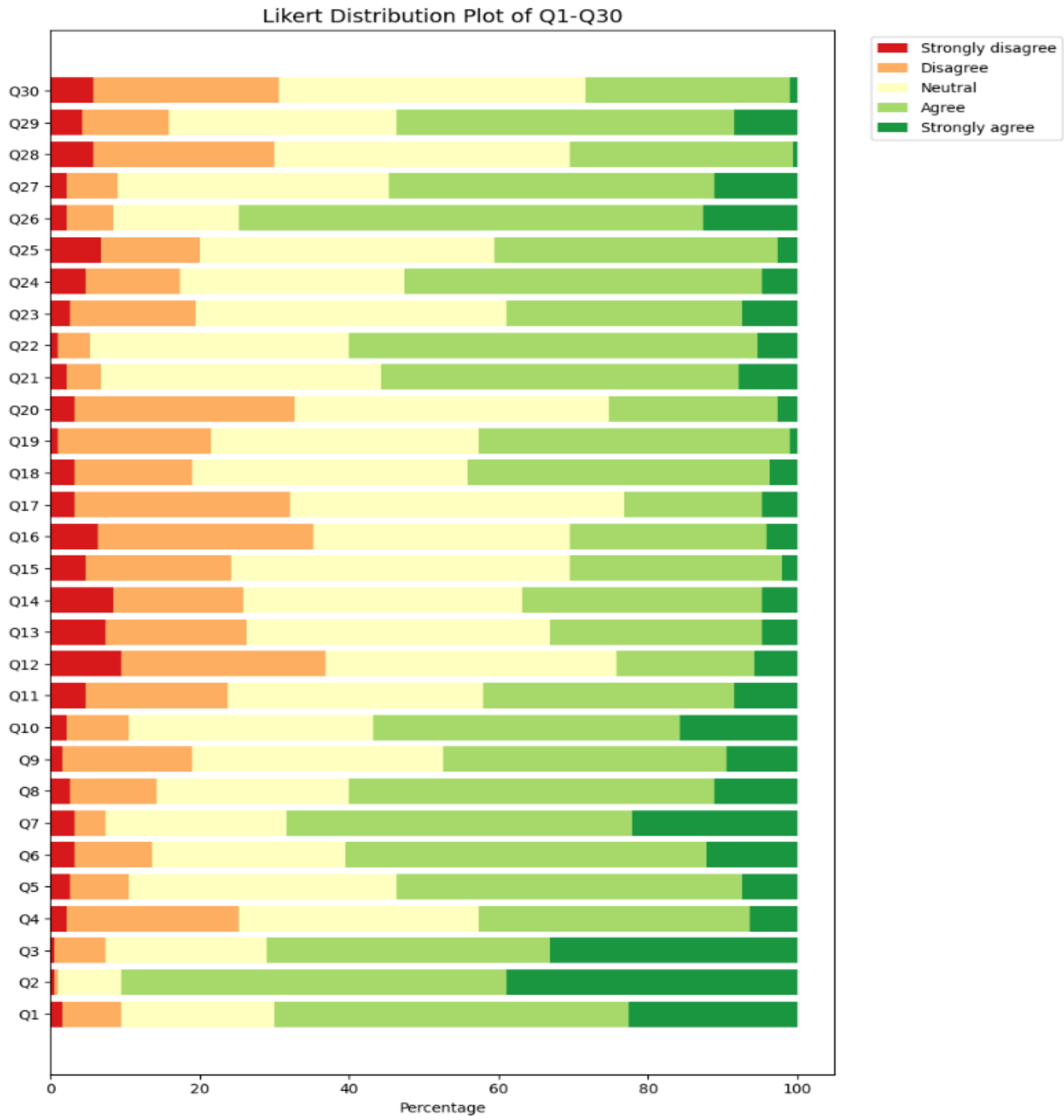
Lastly the items at the end related to “Cultural” shift show a low concentration of "Disagree” responses, suggesting that the staff feels a solid structural anchor for the change. Indicatively Q26 stands out in the final block with a very strongly "Agree" segment (75%), confirming that employees successfully understand why RDARR fosters a culture of data-driven decision-making. At the same time "Neutral" responses are around 35%, which may indicate ambiguity in the questions or indifference in the topic.

Likert Scale	**Question**	**Disagree (combined)**	**Neutral**	**Agree (combined)**
F1: Urgency	Q1	9,47	20,00	70,53
F1: Urgency	Q2	1,05	7,89	91,05
F1: Urgency	Q3	7,37	21,05	71,58
F1: Urgency	Q4	25,26	32,11	42,63

F2: Coalition	Q5	10,53	35,26	54,21
F2: Coalition	Q6	13,68	25,26	61,05
F2: Coalition	Q7	7,37	23,68	68,95
F3: Vision	Q8	14,21	25,26	60,53
F3: Vision	Q9	18,95	33,16	47,89
F3: Vision	Q10	10,53	32,11	57,37
F4: Communication	Q11	23,68	33,68	42,63
F4: Communication	Q12	36,84	38,95	24,21
F4: Communication	Q13	26,32	40,00	33,68
F5: Empowerment	Q14	25,79	36,84	37,37
F5: Empowerment	Q15	24,21	45,26	30,53
F5: Empowerment	Q16	35,26	33,68	31,05
F5: Empowerment	Q17	32,11	44,21	23,68
F6: Wins	Q18	18,95	36,84	44,21
F6: Wins	Q19	21,58	35,79	42,63
F6: Wins	Q20	32,63	41,58	25,79
F7: Consolidate	Q21	6,84	36,84	56,32
F7: Consolidate	Q22	5,26	34,21	60,53
F8: Culture	Q23	19,47	41,58	38,95
F8: Culture	Q24	17,37	29,47	53,16
F8: Culture	Q25	20,00	39,47	40,53
F8: Culture	Q26	8,42	16,32	75,26
F8: Culture	Q27	8,95	35,79	55,26
F8: Culture	Q28	30,00	38,95	31,05
F8: Culture	Q29	15,79	30,00	54,21
F8: Culture	Q30	30,53	40,53	28,95

Likert scale distribution statistics 14

Across all 8 Kotter dimensions, urgency and coalition show the strongest positive alignment, while empowerment and communication require improvement. Culture displays solid but uneven adoption.



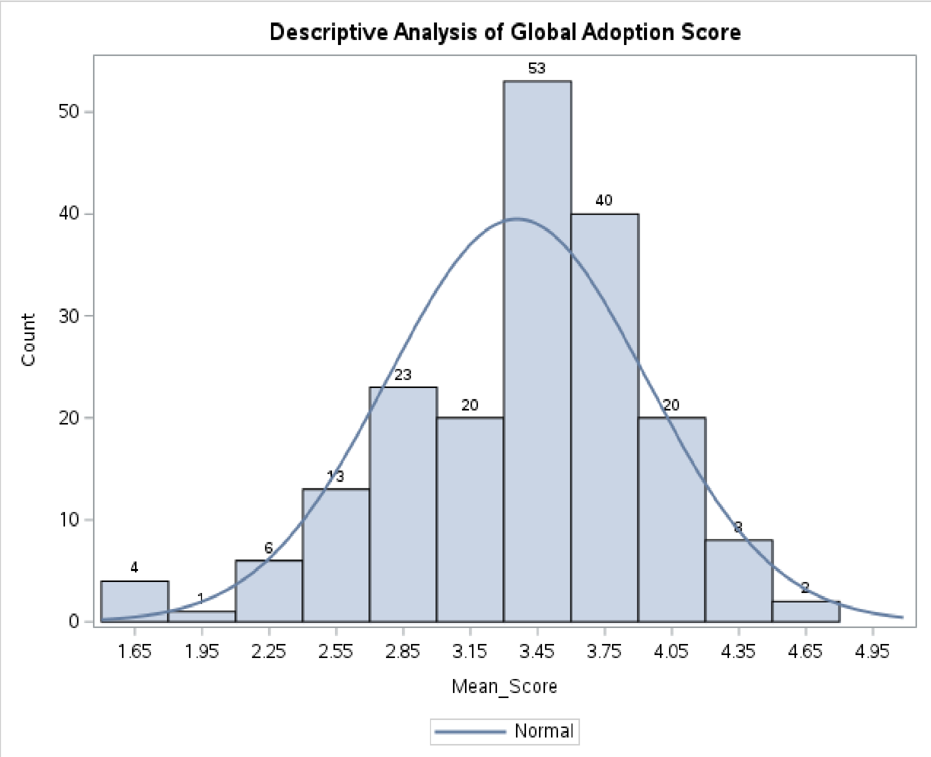
Likert Distribution Plot 21

4.2.3 Reliability Test

The Likert scale parameters were created as the mean value of the related questions. Additionally, a Global Adoption Score parameter was calculated as the mean of all questions (Mean (of Q1-Q30)). Descriptive analysis revealed a mean of 3.36 with standard deviation 0.58. Both Skewness (-0.67) and Kurtosis (0.44) fell within the acceptable range for parametric testing.

Variable	Mean	Median	Variance	Std Dev	Skewness	Kurtosis
F1_Urgency	3,82	3,75	0,39	0,62	-0,30	-0,51
F2_Coalition	3,62	3,67	0,59	0,77	-1,01	2,12
F3_Vision	3,51	3,67	0,66	0,81	-0,53	0,04
F4_Communication	3,04	3,00	0,77	0,88	-0,27	-0,14
F5_Empower	3,00	3,00	0,50	0,71	0,07	0,03
F6_Wins	3,13	3,33	0,55	0,74	-0,34	-0,31
F7_Consolidate	3,58	3,50	0,46	0,68	-0,78	1,47
F8_Culture	3,30	3,38	0,42	0,65	-0,75	0,90
Global Adoption Score	3,36	3,47	0,33	0,58	-0,67	0,44

Reliability test 15



Descriptive analysis of Global Adoption Score 22

The reliability of the questionnaire was assessed using Cronbach's alpha. This coefficient is one of the most commonly used measures of reliability in the social sciences. For a research tool to be considered sufficiently reliable, its value must be above 0.50. Values greater than 0.60 are considered satisfactorily reliable, while values ranging from 0.90 to 0.95 are considered excellent (Taber, 2018).

The table below presents the reliability coefficient values for the questionnaire as a whole, as well as for each group of questions, following Kotter's 8-step model. These values indicate a questionnaire with strong internal reliability. The Cronbach's Alpha is 0.9486 (standardized), which indicates a high level of reliability.

Cronbach Coefficient Alpha	
Variables	**Alpha**
Raw	0,9493
Standardized	0,9486

Questionnaire Cronbach Coefficient Alpha 16

The following table presents the Cronbach's Alpha for the Kotter's 8-step model Likert scale parameters (overall standardized 0.9143). The eight grouped questions are consistent with each other in measuring the effectiveness of the questionnaire.

Cronbach Coefficient Alpha	
Variables	**Alpha**
Raw	0,9123
Standardized	0,9143

Kotter's overall scale parameters Cronbach Coefficient Alpha 17

Cronbach Coefficient Alpha with Deleted Variable					
		Raw Variables		Standardized Variables	
Likert Scale parameter	**Calculation Basis**	**Correlation with Total**	**Alpha**	**Correlation with Total**	**Alpha**
F1: Urgency	Mean(Q1, Q2, Q3, Q4)	0,6848	0,9040	0,6810	0,9064
F2: Coalition	Mean(Q5, Q6, Q7)	0,6400	0,9075	0,6394	0,9098
F3: Vision	Mean(Q8, Q9, Q10)	0,7612	0,8970	0,7615	0,8996
F4: Communication	Mean(Q11, Q12, Q13)	0,7720	0,8966	0,7745	0,8985
F5: Empowerment	Mean(Q14, Q15, Q16, Q17)	0,7435	0,8986	0,7414	0,9013
F6: Wins	Mean(Q18, Q19, Q20)	0,6737	0,9044	0,6731	0,9070
F7: Consolidate	Mean(Q21, Q22)	0,6796	0,9039	0,6823	0,9063
F8: Culture	Mean(Q23...Q30)	0,7974	0,8953	0,7985	0,8965

Kotter's scale parameters Cronbach Coefficient Alpha 18

For each Likert scale parameter, the following table represents the measure and status for the Cronbach's Alpha within the specific group of questions.

Likert Scale parameter	Items	Cronbach's α Raw	Cronbach's α Standardized	Status
F1: Urgency	4	0,675	0,666	Acceptable
F2: Coalition	3	0,796	0,797	Very Good
F3: Vision	3	0,848	0,848	Very high reliability.
F4: Communication	3	0,842	0,842	Very high reliability.
F5: Empower	4	0,738	0,741	Very Good
F6: Wins	3	0,840	0,842	Very high reliability.
F7: Consolidate	2	0,754	0,758	Very Good
F8: Culture	8	0,866	0,865	Very high reliability.

Kotter's parameters within group Cronbach Coefficient Alpha 19

F1: Urgency has α ≈ 0.67, which is acceptable but not strong.

4.2.4 Chi-square test

As mentioned in the description of the questionnaire, the variables derived from each question are qualitative ordinal variables. To investigate the effect of demographic characteristics on respondents' answers, the chi-square test of independence was selected as the most appropriate method.

The chi-square independence test examines the null hypothesis that two categorical variables are independent (H0) versus the alternative hypothesis of dependence between them (H1). The null hypothesis is accepted if the p-value of the test is greater than 5%, which corresponds to the significance level of the tests.

Of the 240 categorical relationships tested, 28% (n=68) showed statistical significance at the $p < .05$ level. Educational level and Participation are the demographic drivers that impact Culture the most, while Communication is influenced by most demographic parameters.

Chi-Square Analysis: Kotter Items against Demographics

	Age	Current position	Educational level	Familiarity	Gender	Level Of Responsibility	Participation	Years of working experience	Grand Total
F1: Urgency		**2**	**3**	**2**			**2**		**9**
Q1		1	1	1			1		4

Q2		1	1	1					3
Q3							1		1
Q4			1						1
F2: Coalition	**1**		**3**	**1**			**1**		**6**
Q5	1		1						2
Q6			1						1
Q7			1	1			1		3
F3: Vision			**2**		**2**	**1**		**1**	**6**
Q10					1	1		1	3
Q8			1		1				2
Q9			1						1
F4: Communication	**2**	**3**	**2**	**1**		**1**	**1**	**1**	**11**
Q11	1	1		1			1		4
Q12		1	1						2
Q13	1	1	1			1		1	5
F5: Empowerment		**1**	**2**		**2**			**2**	**7**
Q14			1		1			1	3
Q15			1		1				2
Q16		1							1
Q17								1	1
F6: Wins	**1**	**1**	**1**	**2**	**1**	**1**	**1**		**8**
Q18	1	1			1				3
Q19				1		1			2
Q20			1	1			1		3
F7: Consolidate	**1**		**2**		**1**				**4**
Q21			1		1				2
Q22	1		1						2
F8: Culture	**1**	**2**	**7**	**1**	**2**		**3**	**1**	**17**
Q23			1						1
Q24	1	1	1						3
Q25			1						1
Q26			1	1	1		1	1	5
Q27			1		1		1		3
Q29			1				1		2
Q30		1	1						2
Grand Total	**6**	**9**	**22**	**7**	**8**	**3**	**8**	**5**	**68**

Chi-square test 20

Please refer to Appendix C for Chi-square test details.

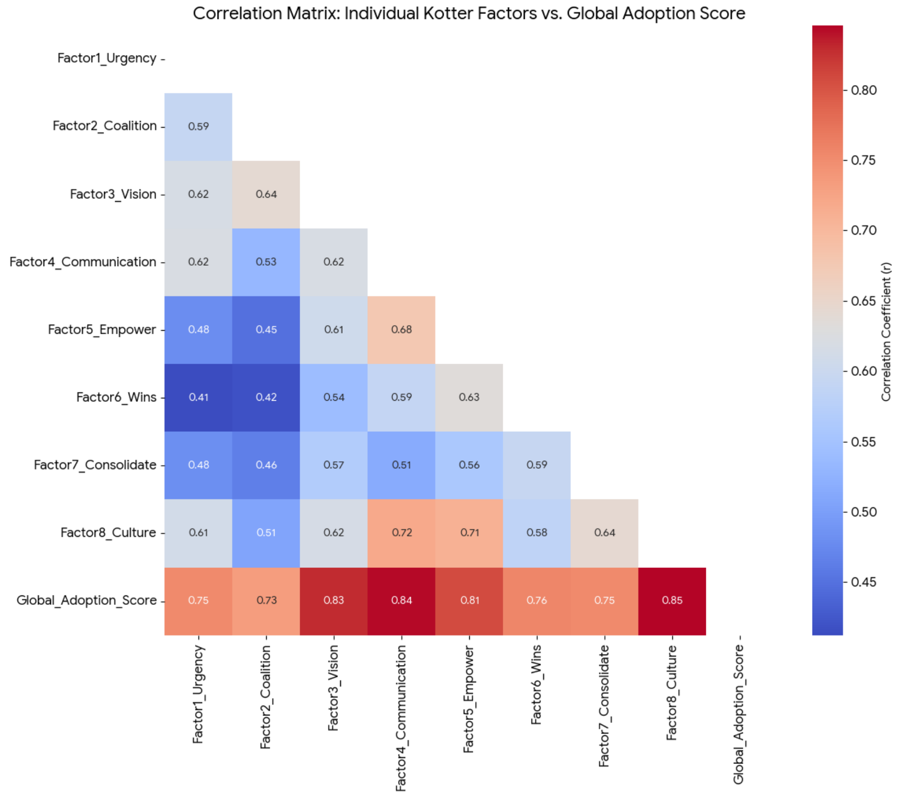
4.2.5 Testing for correlation

The internal correlation analysis examines the significance of each of Kotter's 8 individual change factors that contributes to the overall Global Adoption Score. The analysis reveals positive relationships between all factors ($p < .001$).

Factor3 (Vison) (r= 0.83), Factor 4 (Communication) (r = 0.84), Empowerment (F5) (r=0.81) and Factor 8 (Culture) (r = 0.85) have the strongest correlation with the overall Adoption Score, indicating that clear messaging is critical for making change permanent. Additionally, there is a high correlation between Communication (F4) and Empowerment (F5) (r = 0.68) suggesting that employees feel more confident to act on the change when the message is properly communicated.
Culture is directly related to Communication (r = 0.72) and Empowerment (r = 0.71), drivers that foster adoption on any significant change within every organization.

	F1	**F2**	**F3**	**F4**	**F5**	**F6**	**F7**	**F8**	**Global Adoption Score**
F1_Urgency	1,00	0,59	0,62	0,62	0,48	0,41	0,48	0,61	0,75
F2_Coalition	0,59	1,00	0,64	0,53	0,45	0,42	0,46	0,51	0,73
F3_Vision	0,62	0,64	1,00	0,62	0,61	0,54	0,57	0,62	0,83
F4_Communication	0,62	0,53	0,62	1,00	0,68	0,59	0,51	0,72	0,84
F5_Empower	0,48	0,45	0,61	0,68	1,00	0,63	0,56	0,71	0,81
F6_Wins	0,41	0,42	0,54	0,59	0,63	1,00	0,59	0,58	0,76
F7_Consolidate	0,48	0,46	0,57	0,51	0,56	0,59	1,00	0,64	0,75
F8_Culture	0,61	0,51	0,62	0,72	0,71	0,58	0,64	1,00	0,85
Global Adoption Score	0,75	0,73	0,83	0,84	0,81	0,76	0,75	0,85	1,00

Kotter Factors vs Global Adoption Score correlation 21

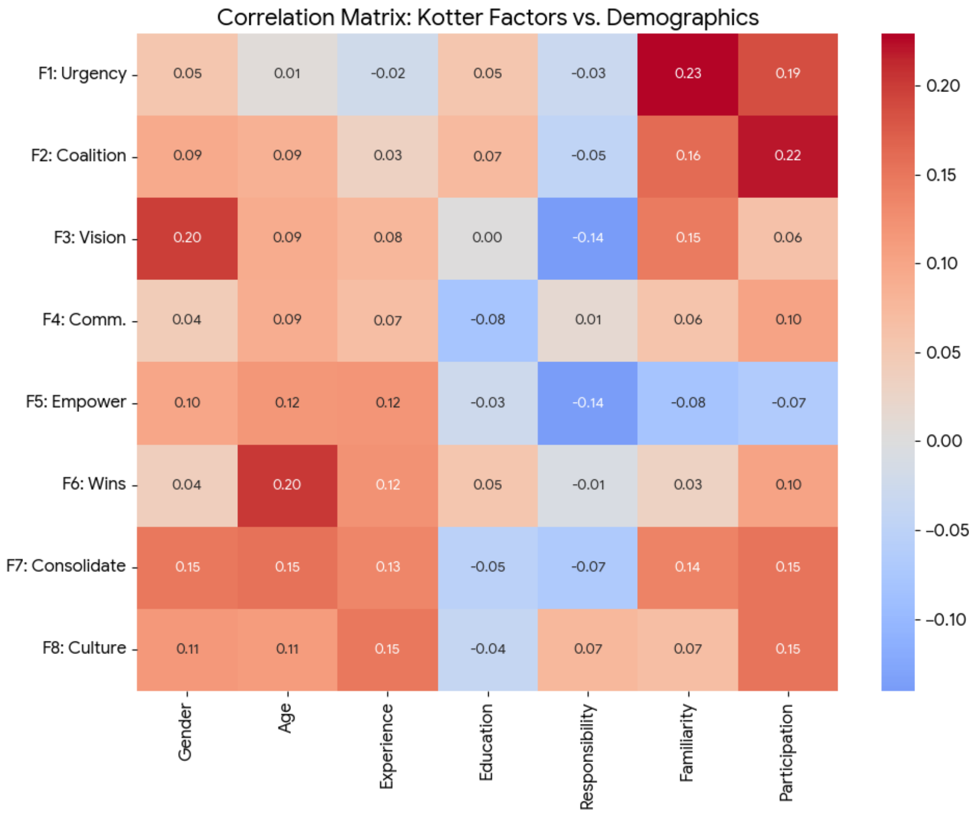


Kotter Factors vs Global Adoption Score 23

The following matrix examines correlation analysis between Kotter's change factors versus the demographic parameters. Categorical demographic parameters were encoded numerically (e.g., Familiarity: No=0, Yes=1; Age: <35=1 up to >54=4) prepared for statistical analysis (Correlation, T-tests, ANOVA, and Regression).

	Gender	Age	Experience	Education	Responsibility	Familiarity	Participation
F1_Urgency	0,0536	0,0062	-0,0233	0,0540	-0,0307	0,2290	0,1862
F2_Coalition	0,0936	0,0853	0,0340	0,0718	-0,0451	0,1619	0,2205
F3_Vision	0,1975	0,0933	0,0776	0,0001	-0,1402	0,1466	0,0626
F4_Communication	0,0440	0,0904	0,0666	-0,0785	0,0149	0,0584	0,1032
F5_Empower	0,0990	0,1176	0,1182	-0,0250	-0,1382	-0,0809	-0,0662
F6_Wins	0,0382	0,2030	0,1212	0,0549	-0,0082	0,0318	0,1027
F7_Consolidate	0,1495	0,1545	0,1347	-0,0535	-0,0685	0,1372	0,1522
F8_Culture	0,1145	0,1119	0,1493	-0,0387	0,0749	0,0674	0,1527

Kotter Factors vs Demographics correlation 22



Kotter Factors vs Demographics 24

Familiarity shows the strongest correlation with Factor 1: Urgency (r = 0.23). This confirms that employees who knew about the change in advance were significantly more likely to recognize its importance. Participation is highly correlated with Factor 2: Guiding Coalition (r = 0.22). Active involvement in the project built significant trust in the leadership team driving the change. Educational Level shows almost zero correlation across the board. Factor 8: Culture and Participation are the key driver for long-term cultural change (r = 0.15).

4.2.6 Regression Analysis

To understand which demographic profiles most strongly predict the success of the RDARR transition, we conducted a multiple linear regression analysis (with a backward selection method, where variables are removed one by one if their p-value > .05), using the Global Adoption Score as the dependent variable and demographic parameters as independent variables.

Analysis of Variance					
Source	**DF**	**Sum of Squares**	**Mean Square**	**F Value**	**Pr > F**
Model	7	3,73355	0,53336	1,65	0,1246
Error	182	58,90891	0,32368		
Corrected Total	189	62,64246			

Root MSE	0,56892	**R-Square**	0,0596
Dependent Mean	3,35737	**Adj R-Sq**	0,0234
Coeff Var	16,94556		

Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	1	3,10539	0,30220	10,28	<,0001
Gender	1	0,12828	0,08634	1,49	0,1391
Age	1	-0,01496	0,08174	-0,18	0,8550
Years of working experience	1	0,07665	0,05749	1,33	0,1841
Educational level	1	-0,01358	0,07789	-0,17	0,8618
Level Of Responsibility	1	-0,11665	0,09403	-1,24	0,2164
Familiarity	1	0,05326	0,14768	0,36	0,7188
Participation	1	0,16997	0,10567	1,61	0,1094

Regression Analysis 23

The F statistic is 1.65 which is very close to one, an indication of a non-meaningful relationship between the predictors (independent variables) and the outcome variable. The coefficients of our model's predictors are not statistically significant at a=0.05

We note that the regression model is not statistically significant ($p > 0.05$) and the coefficients of the demographic variables are also insignificant. In practice, this means that the regression does not provide interpretive power to the analysis.

Please refer to Appendix D for Backward elimination process details.

4.3 Qualitative Data Analysis

The following chapter presents the results of the thematic analysis of interviews with executives from Bank XYZ, which were conducted to address the research question. Based on the participants' responses, the information gathered revealed trends, strategies, and obstacles to the adoption of BCBS 239 and its implementing regulation, RDARR. Respondents were selected based on their roles, experiences, and knowledge of RDARR, bringing together interviewees from various organizational departments, positions of responsibility, and professional backgrounds.

Thematic analysis is one of the methods used to analyze interviews, allowing the researcher to identify, organize, and interpret patterns and themes (Braun & Clarke, 2006). The coding techniques used to identify patterns and conclusions from the interviews yielded various results, which were organized based on the thematic areas used in the interview guide (Appendices B) into three core areas Governance & Strategy, Data Architecture, and Change Management aligned to the thesis objectives.

In summary, the interviews highlighted that compliance with RDARR is not just a technical process, but involves organizational changes, system alterations, and shift to corporate behavior. Management has emphasized that RDARR implementation is under regulatory pressure, and employees perceive it as a compliance-driven activity requiring significant resources, but they don't embrace it as a transformative initiative with a clear long-term vision. The themes include a vague strategic vision, limiting it to a short-term necessity for regulatory purposes, limited resources, inadequate communication leading to limited acceptance by employees, significant infrastructure, and data challenges due to legacy systems, as well as a lack of formal change management and training, which causes cultural resistance.

4.3.1 RDARR: Strategic Goal or a short-term win?

All interviewees acknowledged that RDARR has the attention of senior management and RDARR compliance is considered as a priority because regulatory pressure elevated RDARR to a top priority in the short run. But currently it is treated as a tactical, short-term project. This ambivalence, strategic in name thought tactical in practice, has raised concerns about the sustainability of RDARR's impact. Interviewees worry that if RDARR is treated as a one-off project, the organization will not gain significant results after checking the compliance box.

Interview #1: "It is a strategic priority for the organization. It… it really is – meaning the spotlight is on it; it's being monitored at the highest level, and the organization is focused on this area."

Interview #2: "From my perspective, given my involvement in the RDARR project, I can say very clearly that it's viewed as a strategic priority. It may have started as a regulatory mandate, but it shifted fundamentally and became a strategic priority. I can see that in the meetings of the Board and the Risk Committee—its significance has been elevated, and there's a high degree of top management involvement."

Interview #3: "It has become strategic out of necessity. That's how it's evolved given the requirements. However, what worries me is how it will continue as a routine practice afterward."

Interview #4: "At this moment, I believe there's a lot of attention from the Board of Directors, but I'm not certain it's a strategic priority. It's definitely a priority—a tactical priority for this year, next year, maybe the year after (the next three to four years). But I'm not sure if it's considered a strategic priority."

Interview #5: "Yes, clearly – from the reaction we saw from management regarding the whole RDARR framework and under the supervisor's pressure – it has become a strategic priority for the bank."

Interview #6: "No, I'd say it's being handled more in a tactical manner. It feels like we're just trying to close issues, do what's asked by the regulator, tick the boxes, and then kind of see what comes next. It's not a holistic approach in the sense of 'we're doing this to set ourselves up better for the future. I'm telling you how I see it overall. In my own view, yes, it should be something broader and ongoing. But from the perspective of senior management, I haven't perceived that same long-term approach. Their approach seems to be: let's just do what we need to do to be compliant and close the required items."

4.3.2 Leadership Vision and communication barriers

A clearly communicated RDARR vision emerged as a critical theme. Senior management has in most cases endorsed the RDARR initiative, but the communication of its purpose and benefits has been limited in scope. Interviewees noted that leaders are invested in monitoring implementation progress but a bank-wide vision for RDARR has not been effectively disseminated. Communication about RDARR remains limited in reaching all levels of the organization and addressed mainly to the teams and departments directly involved. Additionally, the methods of communication have also been limited. People directly involved in RDARR projects have understood the importance and vision, but others only perceive the compliance mandate are experiencing a lack of understanding the vision. RDARR has not been broadly socialized meaning staff and departments not directly involved in the project remain largely uninformed.

Interview #1: "The information hasn't reached everyone. And it's not just about how management communicates it – whether they've said it once or twice. It's also about the culture and the readiness of the people down the line. In my view, much more work was needed in terms of how to communicate it and how to set the direction, you know, where we need to go. I'm talking about the organization as a whole, not just the targeted areas."

Interview #2: "Yes, there is a vision. However, RDARR is something very dynamic—it's still evolving, and so the vision itself evolves as technology and circumstances change. In other words, there is an overarching vision, but it's not static; it adapts as things (like technology) progress. And, to answer your question about communication, that vision is being passed down to the units involved in the project. Now, I can't speak for every single division—like, I'm not sure about our branch network, since I don't interact with them—but in the areas I do work with, I see the vision cascading downward. So, upper management in various areas knows this is going on; they're aware of the changes and how the project is progressing. But whether that understanding reaches the staff at the lower levels of those areas, I'm not sure, since I'm not out in the field there."

Interview #3: "Up until now, from what I understand personally and from others, there isn't a clear vision – or at least, it hasn't been communicated as it should. It hasn't been cultivated either. Perhaps in a few very isolated units that are directly involved, there have been some communications. But if I judge from my own position—where I'm heavily involved in this topic—then no, it hasn't happened in a meaningful way. There's been no substantive communication through various means to ensure full understanding. Even if a vision exists, it hasn't been effectively conveyed or cultivated organization-wide."

Interview #4: "Within the scope of these projects—aimed at achieving the two-year plan, for example—there is a plan and a vision. Especially at the subsidiary level, there's a plan: where we are now and where we're heading. Management, at a very high level, is monitoring it. So yes, I'd say they have set a direction and are keeping an eye on it. It's been understood at the management level. That was perhaps the most important part. Subsequently, it's understood by maybe 2-3 key units: IT, Data Governance, and the team involved (Risk Management, possibly Finance to some extent). For the rest of the organization, it's not certain."

Interview #5: "Well, first of all, I believe there is a clear commitment from senior management, which is evident in the intensity and weight they put on creating new processes and new systems. A lot of emphasis has been placed on this recently. Management is heavily involved from above, overseeing the full implementation, so the answer to question 3 is definitely yes. Leadership is communicating the importance of it. However, I don't think it's clearly [communicated] across the entire bank yet – which eventually RDARR will have to be. The significance of it is communicated at the director level and within working teams. But it hasn't yet been clearly communicated to all employees."

Interview #6: "It has been communicated, but I wouldn't say as a grand vision. It's been communicated – not throughout the whole bank, but to the teams working on it with tight deadlines – essentially like, 'We have to do this because it's a regulatory obligation and our CEO has committed to it.' It's not being promoted as 'We truly believe in this and here are the benefits.' It's more like, 'We've promised to deliver this, so we must, and the timelines are very strict.'"

4.3.3 Resource allocation: Initial Push versus sustainable support

A question raised whether sufficient resources – budget, technology, and people – have been allocated to support RDARR as an ongoing strategic initiative. In the initial phase, management did invest in those resources, but interviewees confirm that this happened using external consulting to support kick-start of the two-year RDARR program.
The resource sufficiency and skilled human resources have not properly accounted for the ongoing workload and human capital needed to sustain RDARR compliance long-term.

Interview #1: "The resources, in my opinion, are falling short. Now, this is tricky – it's, how to say, it's a borderline question, because I can't exactly say "shut down the bank to work only on RDARR". We have to run the bank and do RDARR. In my view – and given the general lack of experts in this area – I think it's barely enough, if not slightly inadequate."

Interview #2: "Okay... well, there are many moving parts. But I do believe we have sufficient resources because we're utilizing both internal teams and external consultants. They've actually initiated projects that go beyond merely meeting the immediate regulatory requirement—I can say that with certainty. In other words, there are projects under RDARR that aren't just about ticking the compliance box; they're aimed at longer-term improvements."

Interview #3: "I can't speak to budget specifics, but I'll focus on human resources. From what I've seen so far, no, there's a shortage of people. We lack the necessary staff to shoulder the scope of this project. Yes, focusing on the bank's internal staff. For a project of this magnitude, you need to have sufficient people available to support it and truly dedicate themselves to it—and I don't see that in place."

Interview #4: "At one point, the organization provided a pretty good budget for organizing and implementing the framework – in terms of systems and processes – and it set up committees to implement them. However, at this stage, it hasn't dedicated the needed resources or time. It gave what was needed for the initial implementation as a project – it did that – but it hasn't allocated the resources needed for the ongoing operation afterwards. The recurring tasks we discussed – the ongoing work required – will demand a lot of time from bank employees who currently can't cope as things are."

Interview #6: "Well, if we had put aside some of our regular projects and said, 'We believe strongly in RDARR as the bank's future, so we're going to give it our full attention,' then maybe the current staffing, budget, etc., could be enough. But since we're effectively saying 'business as usual' – continuing all regular work as normal and at the same time trying to meet RDARR deadlines – I think the resources are not sufficient. People can't cope with everything as things stand. And the resources we're investing are being allocated with that short-term mindset."

4.3.4 Understanding the "Why" and embracing gains.

Employees, bank-wide, do not clearly understand what RDARR is and what they will need to do to achieve compliance. RDARR's workload may foster skepticism with the aim of improving the business. Participants noted that the initiative's heavy workload and aggressive timelines have left little room to demonstrate early benefits.

Interview #1: "Because understanding requires time, and when you don't have time (because you have 200 other tasks, say, in your department, all with their own deadlines and functional priorities), then you can't digest this thing. You see it as a chore, something to just put in place without, perhaps, any substance behind it. So, in my view, the understanding is not sufficient."

Interview #3: "People certainly realize "we have to comply". But in my view, they don't have a deep understanding beyond that. I, for example—due to my experience with data and the nature of my role—may understand the broader compliance obligations to some extent. But other participants from different units mainly grasp that "we need to be compliant." I believe a deeper level of understanding is required across the board regarding all these compliance efforts."

Interview #4: "Only in pockets of knowledge, centered around those 2-3 units I mentioned. For the vast majority of staff, the answer is no, not yet. And honestly, no matter what we do at this point—even if we offered training to everyone—I doubt we could make all those people understand and commit. Practical involvement is what will activate them. Through real experiences, they'll start to engage."

Interview #5: "Not at this stage, no. The awareness of its importance and where we're heading isn't widespread across the whole bank. It's limited to the people involved in the projects related to RDARR – those who have guided the whole story and those who collaborated on completing the projects to meet the supervisor's requirements."

Interview #6: "I believe it's been understood even at relatively lower levels. That is, when people hear 'RDARR now, they respond, 'Okay, tell me what you need.' They've been informed by their managers that the bank has launched this, that it's a strategic priority, that we have to accomplish certain things under this project called RDARR. Generally, if you send an email saying, 'Please pay attention, I need something related to RDARR,' you'll get their attention. Now, if you talk about someone completely unrelated to the project, like a branch employee who has no role in it, maybe they won't know exactly what RDARR is. But anyone participating at any level knows it's something important that they may need to prioritize when asked."

4.3.5 Complex Legacy Systems and the Challenge of Data Aggregation

Technical and architectural hurdles are highlighted to achieving RDARR objectives. The IT environment is characterized by legacy systems and fragmented data silos, which make the RDARR principles difficult to implement.

Interview #1: "The biggest example: for instance, we're asking for the RDARR lineage and no one… no one can tell you exactly what that is. So our current infrastructure is lacking."

Interview #2: "The whole RDARR framework—if I can put it this way—nudged us into being much faster and more rigorous with our data. Now our data has to be accurate and tightly aligned; our processes have to be automated end-to-end; all our reporting must be as streamlined and correct as possible. Our data repositories have to be fast and efficient so that at any moment we can provide the best possible information, both internally (to our committees) and to the supervisory authorities when asked. I see the mindset changing across the board. To put it another way, the days of casually "playing around" with little spreadsheets are coming to an end."

Interview #3: "I understand the broader digital transformation that's happening—it would occur sooner or later because of technological evolution, with or without RDARR. In my opinion, RDARR is not the driving force behind those changes. It's not the key lever causing all those tech initiatives."

Interview #4: "Until now, data management was, for most bank employees, something foreign—something they thought didn't concern them. They saw themselves purely as banking professionals, with no connection to data or data processes, and frankly they didn't want any connection. If they did engage with data tasks, it was incidental to their job."

Interview #5: "Therefore, at this moment, we understand the Bank is implementing RDARR as much as possible given its current systems and capabilities. It will take at least a three-year period – and that's an optimistic estimate – to reach something close to full implementation in our systems and have everything correct. For the IT part to comply with RDARR, it's huge. Because, as in most banks, there are so many systems, with interconnections that are quite complex. There isn't one top-down system that covers everything, which would have made applying the principles easier. So, creating things like ETLs, data catalogs, data lineage, etc., is very difficult. There are various streams, projects that the bank is executing now to upgrade and unify many of its systems. Once those are completed, they will help RDARR be implemented better. And conversely, implementing

RDARR will make executing those projects easier. So RDARR is directly linked to the difficulties of the bank's IT systems and their complexity."

Interview #6: "Regarding IT infrastructure: there are some attempts to make things faster or more efficient – for instance, doing data mappings, setting up KQI (Key Quality Indicator) checks, and so on. But my impression is that the approach has been reactive. For instance, if a need arises, we might go and get an additional server or something to put a patch on a problem. But we haven't, say, significantly upgraded our overall infrastructure or added long-term staff specifically for this. We're just trying to squeeze RDARR into our existing operations."

4.3.6 Absence of a Structured Change Management Approach

From the responses, it is obvious that the bank has not implemented any formal change management framework (such as Kotter's 8-step model or the ADKAR model). Instead, the change resulting from RDARR is driven by regulatory deadlines and managed in a manner focused on mid-term projects. In practice, this means that changes are lacking an explicit change management strategy resulting in insufficient training, and cultural deficiency.

Interview #1: "In short we're just not that mature at this point to be able to accelerate and be fully compliant end-to-end with what RDARR describes (or what the regulator is asking for). We might implicitly understand that such change needs to happen, but it's not what we care about right now. Plainly put, we're not looking at the substance."

Interview #2: "The Bank does recognize it, but because it's such a large organization, changes happen more slowly—like an elephant moving, if I can use that metaphor. We know this requires change management, but we haven't formally adopted a specific model yet. We're still in the planning and thinking phase of how exactly to do it. We know it needs to be done, and we're starting on it, but progress is slow."

Interview #3: "The bank does realize changes are needed, but being a large organization, it moves slowly and I haven't seen any sight of formally adopting a specific model or framework. We're still sort of figuring out how to do it. We know it's necessary, but progress on the change management front is quite slow."

Interview #4: "The entire program, indeed, is about changing roles, organizational structures, duties, and ultimately changing mindsets and culture. That's clear. But as for a specific change management model? I'm not aware of any formal change management framework being followed. The bank isn't explicitly saying, "We're using X change model to drive this. We seem to be handling it in a very project-oriented way—like a two-year plan with specific tasks to cover the findings, and that's it, maybe with a few minor add-ons or fixes here and there."

Interview #5: "I think it's too early to be talking about a change management framework in this process. It's something that will come later as a result of RDARR's implementation. Right now, we're approaching compliance somewhat partially – not fully. So, I think it's a bit early. Certainly, the implementation of RDARR, I think, will bring a change management framework shift to the current state. And something like that will necessarily happen, but there should also be [a formal plan] – and at the moment I'm not seeing one."

Interview #6: "This is a key question. Some experts and academics argue that data governance initiatives – and specifically something like implementing RDARR – are essentially change management processes. I thing we are just started to exploring how the organization handles that. I don't see evidence of any structured change management approach. "

4.3.7 New Roles: Introduced but Not Yet Operationalized

The updated data governance framework describes the rollout of new data governance roles such as Data Owners, Data Stewards, and Data Domain Managers which are required by the RDARR/BCBS 239 framework. These roles are intended to assign clear accountability for data quality and processes across business lines. In theory, the bank has formally defined and assigned these roles but in practice they have not been fully implemented or embraced. This gap has led to confusion and inefficiencies. Employees who are tagged as "Data Owners" or "Stewards" often do not yet know what their new responsibilities entail. In other words, many role-holders have not been equipped to carry out the duties now expected of them. Additionally, the new data roles largely add to employees' workloads without relieving them of prior responsibilities. This lack of role integration has implications because employees perceive the data governance tasks as "completely foreign and unrelated to their real job" instead of as part of how the bank operates.

Interview #1: "Exactly. We're saying that on top of a functional role comes another role. And that's the problem. There shouldn't be "another" separate role – it should be a functional part of the same role. Not everyone believes that, though. People don't want it; they push back. They don't see the value in all this. Right now, they don't understand how this will help them in their daily work, their team, their department, or the bank as a whole."

Interview #2: "From what I've seen so far, those roles have been defined on paper and people have been assigned to them, but we haven't really gotten into the substance of those roles yet. In practice, they're not fully active. The roles have been described in the framework, but we haven't actually embedded them in the workflow yet. They exist in theory, but not fully in practice."

Interview #3: So far, these roles exist only on paper. People have been assigned titles like Data Owner, Data Steward, etc., but we haven't truly activated those roles in practice. They haven't been embedded in the daily workflow. Essentially, the roles are described in the documentation, but in everyday operations, nothing has really changed yet.
Interview #4: "Let's use a different example, because Risk and Finance were already relatively data-aware departments. The tension is much more visible in other units outside those areas, where people are now being asked to do significant data management tasks. If you go to those other business units, you'll find that many view these new data duties as completely foreign and unrelated to their real job. Also, in many cases, I'm not sure they even have the skills to do them properly—plus, a shift in mentality is needed. And

naturally, they feel like we're piling on new duties that they consider unrelated to their primary job, duties they frankly don't want to accept."

Interview #5: "The truth is that with the RDARR framework, most people have taken on an additional responsibility and some new obligations. One can't say those conflict with their existing role – but they obviously add an extra burden. I see that it adds an extra workload which, with the resources I currently have. It adds additional volume of work — that's the only negative. The framework has been set up, I think it's been approached correctly at the start. If adjustments need to be made along the way, some corrections can happen."

Interview #6: "Honestly, I don't think the roles have been clearly defined, and they haven't been communicated properly either. With the RDARR framework, most people have taken on additional responsibilities on top of their normal roles. It doesn't exactly conflict with their old duties, but it certainly adds extra burden. It unquestionably multiplies their work."

4.3.8 Cultural Resistance and lack of appropriate training

RDARR's success requires a cultural shift that is difficult to achieve. Most interviewees reported some degree of employee resistance to the way the change is being implemented. Interviewees also mentioned the deeper mindset challenges involved in making RDARR a true cultural transformation directly related to skills and capability gaps. The significance of training was also mentioned to emphasize that the bank has not yet implemented an adequate training program to prepare staff for RDARR-related changes.

Interview #1: "To actually train someone in something, you have to be there, focused. And training isn't one-time; it's ongoing. If you don't have time, how can you focus?"

Interview #2: "If you train people well and give them a reason to care, they'll participate in the change. So, I wouldn't say new roles are inherently an obstacle—if we handle the rollout correctly. At this point, it's going at a deliberate pace because you might need to make structural changes. You can't just tell someone to wear two hats forever; at some point you need clear, dedicated positions. Otherwise, it's not going to work."

Interview #3: "I don't think the new roles themselves have to be a barrier, as long as the bank provides strong training and clear incentives. If you train people properly and give them a reason to care, they'll embrace the change. Organizational changes take a lot of time, so I bet we'll postpone fully implementing the new data governance roles until the last phase."

Interview #4: "There is definitely resistance to this change, and I suspect there will be for many years. The resistance isn't overt or defiant; it's more passive resistance. Many of the people we're asking to take on new tasks are doing the bare minimum required. A lot of them simply lack the knowledge and the mentality to carry out these new responsibilities effectively—that's another issue altogether. Training has its place, yes, but—this is my personal view many of these people, frankly, may not have the capability to adapt to this change, even with training."

Interview #5: "We're very behind on training. I believe it must be done and it is expected to happen, right? The training was minimal due to the short timeframe for implementation. Sure, those involved are gaining more exposure through their involvement – but it's become a learning-by-doing, on-the-job training process, which takes time and practice. And since, as we said, there isn't much time, logically this will be a slow process."

Interview #6: "Frankly, the only thing I've seen that could count as training was a presentation with some flowcharts or algorithms. I'm not sure if they consider that proper training. The training materials should have been more thorough and user-friendly – in Greek, with, say, five clear examples and some easy-to-follow diagrams."

4.3.9 Recommendations to the senior management team

A final important section is the interviewee's recommendations to the senior management team aiming to accelerate RDARR implementation by demonstrating value and maintain momentum in the long run. Key recommendations include: invest in dedicated staffing, involve employees to participate into actual cases, become more aggressive in implementing the necessary organizational changes.

Interview #1: "I would say that my suggestion – whatever it may be, doesn't matter if it's RDARR or anything else – is that, since RDARR is something very new (it's just getting started, even though it's been around for years, now we're trying to implement it), I'd say we need to invest in people and knowledge, and build it up. To me, this hasn't started on the right footing to become a true vision; it started off just to tick a box and get it out of the way."

Interview #2: "I'd encourage them to be more assertive and proactive when it comes to the organizational changes. In other words, don't let those changes become a bottleneck—just address them head-on. You have to make those decisions more decisively. If you go too slowly with an organizational change, you lose valuable time that could have been spent actually making progress."

Interview #3: "Yes, if senior management wants it to function, it must be effective and efficient. Data quality management should operate under fast-track procedures. Projects related to data correction should be executed immediately. The team in charge, must have the appropriate authority to take immediate action on the spot without any delay or interference."

Interview #4: "Most importantly, we involve people through real. Get people involved in building the domains, involved in developing data dictionaries and quality metrics, involved in the OSI reviews and audits, involved in the data validation exercises—so they genuinely feel responsible for the subject matter."

Interview #5: "As an advocate to management, I think they need to do a very good cost analysis of what the implementation of the framework and RDARR rules is causing in terms of workload on people. And figure out what additional resources we'll need so that it's implemented properly – without other operations, the core business of the bank, falling behind."

Interview #6: "My suggestion would be to increase staffing – basically, add more human resources to this effort. In my view, the central data governance team (the DGO) should be spending less time on bureaucracy and more time in the field. Employees need to feel that the data governance people are there to support them. If they feel that, they'll be more willing to cooperate with the new processes. That would make a big difference."

5. Conclusion and recommendations

This dissertation examined how regulatory requirements, specifically Risk Data Aggregation and Risk Reporting (RDARR), operate as a change management process within banking institutions. The analysis was based on a mixed-methods approach combining quantitative data from a survey of 190 banking employees and qualitative insights derived from six semi-structured interviews with experts from different units of the examined banking organization.

5.1 Summary of findings

The study demonstrated that RDARR is not perceived merely as a regulatory compliance obligation but rather functions as a catalyst for broader organizational transformation, influencing operational governance structures, operating models, employee roles, and data architecture. The findings further confirm that regulatory pressure can indeed trigger significant organizational change. However, the scope and sustainability of this change depend on whether organizations move beyond a short-term compliance mindset and operationalize RDARR as a long-term strategic choice.

Both the survey results and the interview findings indicate that RDARR functions as a platform for wider transformation, encouraging banks to adopt integrated data quality architectures with a strong emphasis on data ownership and accountability. The evidence suggests a dual objective: on the one hand, achieving compliance with supervisory assessments, and on the other, implementing organizational changes that support and strengthen managerial decision-making in organizations that are increasingly data-driven. Interview participants consistently associate RDARR with improved decision quality, particularly when data governance becomes embedded in everyday practice and reliable data are recognized as strategic assets, thereby creating competitive advantage within a continuously evolving business environment.

The study also highlights distinct challenges in RDARR implementation. Quantitatively, the strongest dimensions were Urgency and Management Coalition, suggesting that employees recognize the importance of RDARR and perceive leadership attention toward its adoption. In contrast, Communication and Empowering Action emerged as the weakest dimensions, indicating that although many employees understand the importance of RDARR, they lack clarity regarding how they should contribute.

The Global Adoption Score indicates moderate but incomplete operationalization, a finding further reinforced by the qualitative evidence. Interviewees repeatedly described RDARR as "strategic in rhetoric but tactical in execution", pointing to limited enterprise-wide communication, insufficient awareness and training, and the absence of a formal change management approach. New data governance roles such as data owners and data stewards, have been formally defined in policies and procedures, yet they have not been fully embedded into daily practice. As a result, cultural resistance persists, particularly when staff perceive RDARR-related responsibilities as an additional burden rather than an integral part of their role.

Ultimately, the success of RDARR implementation lies at the intersection of regulatory obligation, data governance, technology, and human capital. It depends on leadership commitment, role clarity, communication quality, employee engagement, and the willingness to adopt new behaviors. This reinforces the central argument of the dissertation: compliance with RDARR can indeed function as a change management process, but only if banking organizations treat it as an enterprise transformation program rather than a temporary project aimed solely at meeting supervisory requirements.

5.1.1 Conclusions

In the examined case, RDARR has triggered operational, technological, and behavioral changes. Senior management attention increased, investments in data architecture expanded, and awareness of data quality improved. These outcomes align with the broader regulatory and academic literature, which positions BCBS 239 and RDARR as foundational mechanisms for strengthened risk management and institutional resilience.

However, the findings indicate that regulatory urgency alone is insufficient to drive cultural change or automatically lead to organizational transformation. Empirical evidence suggests that banks often achieve only partial RDARR compliance due to fact that communication remaining confined to project teams, limited training efforts, and insufficient time or human resources. In such cases, RDARR risks being reduced to a compliance exercise characterized by short-term actions under recurring supervisory pressure, rather than a sustainable strategic initiative.

An additional conclusion is that the long-term value of RDARR depends on its operationalization. Organizations derive substantial benefits when RDARR is leveraged to strengthen enterprise data governance, modernize data architecture, and reduce manual intervention. Conversely, when RDARR remains narrowly framed as a purely supervisory requirement, its value-creation potential is significantly constrained.

Quantitative results and interview evidence converge in identifying communication to staff, skills empowerment, and training as central determinants of adoption. Participation was the only demographic variable approaching statistical significance as a predictor of adoption. This reinforces a key insight for both academic research and business practice: RDARR compliance is not solely a data or risk management issue, but also a leadership and organizational change challenge, as people and culture are as critical as systems and supervisory controls.

A central lesson of this study is that the organizational dimension remains underdeveloped. Banking institutions would benefit from defining a structured change strategy that includes mapping emerging governance structures, clear communication plans, role activation, and reinforcement mechanisms. Communication should not be limited to directly affected teams but should instead be open, inclusive, and explanatory, clarifying why RDARR matters for resilience, strategy, and daily operations. At the same time, revised job descriptions, performance objectives, and managerial expectations must explicitly reflect RDARR-related responsibilities, alongside the planning of data governance role-specific continuous training.

5.2 Recommendations for future research

This dissertation also reveals several alternatives for future research. The study focused on Greek national banking organizations for both quantitative and qualitative analysis and was conducted during an active period of regulatory implementation related to RDARR. Future research should therefore expand the empirical scope of the investigation.

5.2.1 ESG Data and RDARR

A promising research direction concerns the relationship between RDARR and ESG related data governance. As supervisory priorities increasingly incorporate climate and environmental risk, banks are required to handle large volumes of non-financial data that are often less mature, less standardized, and less complete than traditional financial data.

Future research could examine whether RDARR principles can be successfully extended to ESG data domains, which differ substantially from those used in credit, liquidity, or capital risk reporting. For example, studies could explore how banks define critical ESG data elements, allocate accountability across business domains, and manage data lineage when ESG data are sourced from external providers or estimation models.

5.2.2 Artificial Intelligence and RDARR

A second research area concerns the intersection of RDARR and artificial intelligence (AI). As banks increasingly invest in AI for risk forecasting, portfolio monitoring, and customer service, the quality and governance of underlying data become even more critical.

Future research could investigate how RDARR requirements support the implementation of trustworthy AI in banking environments and assess whether AI-based tools enhance RDARR operationalization through improved automation and monitoring, or whether they introduce additional governance complexity.

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Appendix A: Survey questions

"The role of regulatory requirements as a change management process in the banking industry. The case of Risk Data Aggregation and Risk Reporting (RDARR)."

Dear sir/madam,

My name is Vasileios Stamatis and I am a postgraduate student in the MBA program at the Hellenic Open University. This survey is part of my dissertation on how regulatory compliance can shape organizational transformation and impact cultural change.
Your participation in this research is voluntary. All answers are anonymous and the information you provide will be treated as confidential. The collected responses will be used exclusively in aggregate level for research purposes.
Completing this questionnaire should take approximately 7-10 minutes and your participation is valuable to the success of this study. Please, respond to the questions with the highest possible honesty and accuracy, by choosing the answer that corresponds the best to your experience and point of view. Answering all questions is important for the proper conduct of the survey and will help to collect reliable data.
You can stop completing the questionnaire at any time during the process. In this case, all data and answers you have provided up to that point will not be saved and will be destroyed.
Thank you in advance for your participation!

Vasileios Stamatis
MBA Student
Hellenic Open University
email: std151376@ac.eap.gr

<u>Demographics</u>

Gender:
- Male
- Female
- Other

Age:
- <35
- 35-44
- 45-54
- >55

Years of work experience:
- <= 5
- >5-10
- >10-15
- >15-20
- >20

Educational level:
- Secondary Education
- Bachelor's degree
- Master's degree
- PhD

Level Of Responsibility (current position):
- Employee / Officer
- Manager / Director
- Executive
- Other

Currently working at:
- Distribution Networks / Retail Banking
- Corporate Banking / Wealth Management
- Human Resources
- Technology, Support & Operations
- Financial Management
- Risk Management
- Other

Are you familiar with the term of BCBS 239 and RDARR (Risk Data Aggregation and Risk Reporting)?
- Yes
- No

Have you recently been involved in any project related to RDARR?
- Yes
- No

Each item below is rated on a 1–5 Likert scale: 1 = Strongly Disagree ... 5 = Strongly Agree. Please indicate your level of agreement with each statement (higher scores indicate stronger agreement).

1) Strongly disagree
2) Disagree
3) Neither agree nor disagree
4) Agree
5) Strongly Agree

Step 1 – Create a Sense of Urgency:
Q1. Top management has clearly communicated that complying with BCBS 239 (RDARR) is an urgent priority.
Q2. Regulatory deadlines create a strong pressure to quickly improve risk data aggregation and reporting capabilities.
Q3. It is clearly communicated that failing to improve risk data processes could result in potential penalties (e.g., fines or capital add-ons from regulators).
Q4. Employees across departments understand, why changes are necessary to meet RDARR requirements.

Step 2 – Build a Guiding Coalition:
Q5. Executives are working together as a unified team to champion the changes required by the new risk data regulations.
Q6. There is a visible support from a broad coalition of leaders (board members and senior management) for the implementation of the RDARR (it is not just being driven by one department).
Q7. A cross-functional task force has been established to lead and coordinate the BCBS 239/RDARR compliance effort (e.g., involving Risk, Finance, IT, and Operations departments).

Step 3 – Develop a Vision and Strategy:
Q8. The organization has defined a vision of how complying with RDARR would improve the bank's risk management and data quality, for example by becoming a data-driven, risk-aware organization.
Q9. A well-defined strategy and roadmap, with clear goals, timelines and resource plans, is prioritized across all departments.
Q10. The RDARR program's goals are linked to our broader strategic objectives, such as improving decision-making and operational efficiency through better data.

Step 4 – Communicate the Change Vision:
Q11: Management regularly and transparently communicates the vision and progress of the RDARR change initiative through emails, workshops, etc.
Q12. Employees at all levels receive consistent messages about why this change is important and how it will secure the bank's future success (e.g. by improving resilience during crises).
Q13. Opportunities are provided for feedback and dialogue, and leaders address any questions or concerns raised by staff regarding the BCBS 239 changes.

Step 5 – Empower Broad-Based Action:
Q14. Does the bank provide sufficient resources (such as budget, technological tools, additional staff or time) to support the RDARR compliance efforts, thereby removing resource constraints as a barrier?
Q15. Organizational obstacles to change are identified and removed, for example by breaking down silos in data ownership or updating rigid policies that impede cross-departmental collaboration.

Q16. Employees receive adequate training and support on new data governance policies, IT systems and data quality standards to prepare them for the new processes introduced by the RDARR program.
Q17. Staff are empowered to take the initiative and make decisions within their areas to help meet RDARR goals.

Step 6 – Generate Short-Term Wins:
Q18. The RDARR program achieved some quick wins, such as promptly fixing a major data quality issue and automating a key risk report, and these successes were clearly communicated internally.
Q19. There are tangible improvements demonstrating progress, such as faster report turnaround times and a noticeable reduction in data errors.
Q20. The organization recognizes and publishes these tangible improvements to build momentum for the ongoing change effort.

Step 7 – Consolidate Gains and Produce More Change:
Q21. Building on BCBS 239 compliance, the bank is launching projects to continue transforming data-related processes, such as the use of advanced analytics and AI.
Q22. The bank continues to monitor progress and adapt its strategies to ensure that improvements in risk data aggregation and reporting are sustainable.

Step 8 – Anchor New Approaches in the Culture:
Q23. Changes resulting from RDARR compliance, such as greater attention to data quality, have become part of everyday culture and routine rather than a one-time project.
Q24. Senior leaders continue to emphasize the importance of effective risk data management and reporting as a core value of the bank, for example in speeches and performance reviews.
Q25. Structural changes have been made to sustain the improvements, such as updating job descriptions or embedding data quality checkpoints into the standard operations of your unit.
Q26. Compliance with RDARR fosters a culture of data-driven decision-making.
Q27. Working with RDARR in the "new way" will improve my performance at work.
Q28. Employee roles in the bank are designed to accommodate RDARR changes (e.g. training now emphasizes data governance and risk reporting competencies).
Q29. You clearly understand what is expected of you in return for applying RDARR principles in your workplace.
Q30. Employees have the necessary skills to influence the level of RDARR adoption in the bank.

<u>Potential risks and challenges</u>

Please write any ideas related to RDARR adoption process in your organization (max 50 words)

Appendix B: Interviews questions

Participant Consent Form

Dear sir/madam,

My name is Vasileios Stamatis, and I am an MBA student at the Hellenic Open University. This survey forms part of my dissertation, which examines how regulatory compliance can influence organizational transformation and cultural change.

Your participation in this research is voluntary. All answers are anonymous, and any information you provide will be treated as confidential. The collected responses will be used exclusively at an aggregate level for research purposes.

This research will not put you at risk or compromise your personal information in any way. Your participation will remain anonymous, and no personal information will be requested except for information about your role. You also agree that the interview may be audio recorded, and that you have the right to review your responses and request changes or clarifications if necessary.

I………………………………………………………………………………………...agree to participate in this research project, which is titled: **"The Role of Regulatory Requirements as a Change Management Process in the Banking Industry: The Case of Risk Data Aggregation and Risk Reporting (RDARR).**"

The researcher has explained the purpose of the study to me, and I am participating in a virtual or physical interview voluntarily. The interview will take approximately 30 minutes.

The following questions assess organizational, technological, and cultural enablers of RDARR (BCBS 239) within your bank. The questions will identify how RDARR and BCBS 239 represent more than just a technical IT or regulatory challenge, but it is a catalyst for profound organizational transformation.

Governance & Strategy

Q1. Could you please describe the impact of RDARR compliance on your organization's strategic priorities?

Q2. Does your institution have a clearly defined RDARR vision that has been endorsed by senior management?

Q3. Could you please clarify how leadership communicated the importance of RDARR compliance vision internally? Which methods were used to communicate the vision?

Q4. Does the bank provide adequate dedicated resources (such as budget, technological tools, additional staff, or time) to support the RDARR compliance efforts?

Q5. Could you please indicate whether employees have a clear understanding of the company vision, and whether they understand the reasons behind the RDARR compliance requirements?

Q6. Please describe the organizational, technological, and cultural challenges you are facing in your efforts to view RDARR compliance as a strategic opportunity rather than a regulatory or compliance burden.

Q7. In what ways does RDARR compliance facilitate or impede the achievement of wider digital transformation objectives?

Data Architecture

Q8. Is your current IT infrastructure poses significant challenges to RDARR compliance and what measures you take to address these challenges?

Q9. Is your infrastructure prepared to articulate the data journey (source → transformation → controls → report) through traceable workflows

Change Management

Q10. Is there any change management framework applied during RDARR implementation? How did you get employees to participate in implementing the change?

Q11. Does resistance to change represent a significant barrier to RDARR implementation, and if so, how do you intend to address this issue? How did you manage to keep focused on the change?

Q12. Are roles and responsibilities for RDARR documented and communicated across all business levels?

Q13. Do current roles have been redefined to support RDARR compliance and whether new job descriptions have been embedded in the performance objectives, especially those related to data ownership and stewardship?

Q14. Do you feel that managers behaved in line with the RDARR strategy and vision? Is the vision linked to daily job tasks?

Q15. How was an active change network/champions group formed, and how was adoption reinforced in business units to encourage key employees to participate in the process?

Q16. What training programs have been implemented with a view to preparing staff for RDARR-related changes, and has sufficient training been provided to employees?

Q17. Have you managed to achieve short-term wins? Have you taken the time to evaluate positive or negative changes?

Q18. What recommendations would you propose to the senior management team?

Appendix C: Chi-square test details

Factor	Item	Variable	df	Chi-Sq	p-value
F1: Urgency	Q1	Educational_level	12	40,13	<.001
F1: Urgency	Q1	Current_position	24	44,55	0,007
F1: Urgency	Q1	Familiarity	4	42,19	<.001
F1: Urgency	Q1	Participation	4	18,57	<.001
F1: Urgency	Q2	Educational_level	12	21,06	0,05
F1: Urgency	Q2	Current_position	24	85,13	<.001
F1: Urgency	Q2	Familiarity	4	12,42	0,014
F1: Urgency	Q3	Participation	4	10,74	0,03
F1: Urgency	Q4	Educational_level	12	26,82	0,008
F2: Coalition	Q5	Age	12	24,63	0,017
F2: Coalition	Q5	Educational_level	12	42,91	<.001
F2: Coalition	Q6	Educational_level	12	44,89	<.001
F2: Coalition	Q7	Educational_level	12	43,50	<.001
F2: Coalition	Q7	Familiarity	4	12,59	0,013
F2: Coalition	Q7	Participation	4	20,38	<.001
F3: Vision	Q10	Gender	4	12,34	0,015
F3: Vision	Q10	Years_of_working_experience	16	27,76	0,034
F3: Vision	Q10	Level_Of_Responsibility	12	23,07	0,027
F3: Vision	Q8	Gender	4	9,55	0,049
F3: Vision	Q8	Educational_level	12	28,91	0,004
F3: Vision	Q9	Educational_level	12	32,86	0,001
F4: Communication	Q11	Age	12	26,74	0,008
F4: Communication	Q11	Current_position	24	38,80	0,029
F4: Communication	Q11	Familiarity	4	13,28	0,01
F4: Communication	Q11	Participation	4	10,96	0,027
F4: Communication	Q12	Educational_level	12	23,53	0,024
F4: Communication	Q12	Current_position	24	44,97	0,006
F4: Communication	Q13	Age	12	25,63	0,012
F4: Communication	Q13	Years_of_working_experience	16	26,54	0,047
F4: Communication	Q13	Educational_level	12	36,57	<.001
F4: Communication	Q13	Level_Of_Responsibility	12	22,04	0,037
F4: Communication	Q13	Current_position	24	44,86	0,006
F5: Empowerment	Q14	Gender	4	9,55	0,049
F5: Empowerment	Q14	Years_of_working_experience	16	26,95	0,042
F5: Empowerment	Q14	Educational_level	12	29,74	0,003
F5: Empowerment	Q15	Gender	4	10,44	0,034
F5: Empowerment	Q15	Educational_level	12	41,68	<.001

F5: Empowerment	Q16	Current_position	24	55,77	<.001
F5: Empowerment	Q17	Years_of_working_experience	16	36,31	0,003
F6: Wins	Q18	Gender	4	15,80	0,003
F6: Wins	Q18	Age	12	21,94	0,038
F6: Wins	Q18	Current_position	24	50,43	0,001
F6: Wins	Q19	Level_Of_Responsibility	12	38,10	<.001
F6: Wins	Q19	Familiarity	4	10,66	0,031
F6: Wins	Q20	Educational_level	12	37,31	<.001
F6: Wins	Q20	Familiarity	4	9,50	0,05
F6: Wins	Q20	Participation	4	14,05	0,007
F7: Consolidate	Q21	Gender	4	11,78	0,019
F7: Consolidate	Q21	Educational_level	12	25,26	0,014
F7: Consolidate	Q22	Age	12	27,60	0,006
F7: Consolidate	Q22	Educational_level	12	32,39	0,001
F8: Culture	Q23	Educational_level	12	44,73	<.001
F8: Culture	Q24	Age	12	21,67	0,041
F8: Culture	Q24	Educational_level	12	34,31	<.001
F8: Culture	Q24	Current_position	24	56,23	<.001
F8: Culture	Q25	Educational_level	12	31,05	0,002
F8: Culture	Q26	Gender	4	11,34	0,023
F8: Culture	Q26	Years_of_working_experience	16	27,33	0,038
F8: Culture	Q26	Educational_level	12	40,39	<.001
F8: Culture	Q26	Familiarity	4	26,15	<.001
F8: Culture	Q26	Participation	4	20,69	<.001
F8: Culture	Q27	Gender	4	11,39	0,023
F8: Culture	Q27	Educational_level	12	46,94	<.001
F8: Culture	Q27	Participation	4	13,07	0,011
F8: Culture	Q29	Educational_level	12	37,08	<.001
F8: Culture	Q29	Participation	4	18,67	<.001
F8: Culture	Q30	Educational_level	12	29,58	0,003
F8: Culture	Q30	Current_position	24	38,54	0,031

Appendix D: Regression Analysis Backward elimination process

Backward elimination process eliminated variables like Age, Years of working experience, and Education Level. This means that the RDARR adoption is not bound to specific Age or limited to highly educated staff.

Participation remained in the model as the only important demographic predictor that approaches statistical significance in predicting the overall score (p-value 0.0524). The positive coefficient beta 0.17 suggests that moving an employee from a "non-participant" to a "participant" role increases the adoption score by nearly 0.2 units on the 5-point scale.

Analysis of Variance					
Source	**DF**	**Sum of Squares**	**Mean Square**	**F Value**	**Pr > F**
Model	1	1,24473	1,24473	3,81	0,0524
Error	188	61,39774	0,32658		
Corrected Total					

Root MSE	0,57148	**R-Square**	0,0199
Dependent Mean	3,35737	**Adj R-Sq**	0,0147
Coeff Var	17,02152		

Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	1	3,25258	0,06782	47,96	<,0001
Participation	1	0,16731	0,08570	1,95	0,0524

Author's Statement:

I hereby expressly declare that, according to the article 8 of Law 1559/1986, this dissertation is solely the product of my personal work, does not infringe any intellectual property, personality and personal data rights of third parties, does not contain works/contributions from third parties for which the permission of the authors/beneficiaries is required, is not the product of partial or total plagiarism, and that the sources used are limited to the literature references alone and meet the rules of scientific citations.