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Book

Becoming a data-centric organisation: a guide to data management initiatives at the Bank of Lithuania

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Becoming a data-centric organisation: a guide to data management initiatives at the Bank of Lithuania

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EXECUTIVE SUMMARY

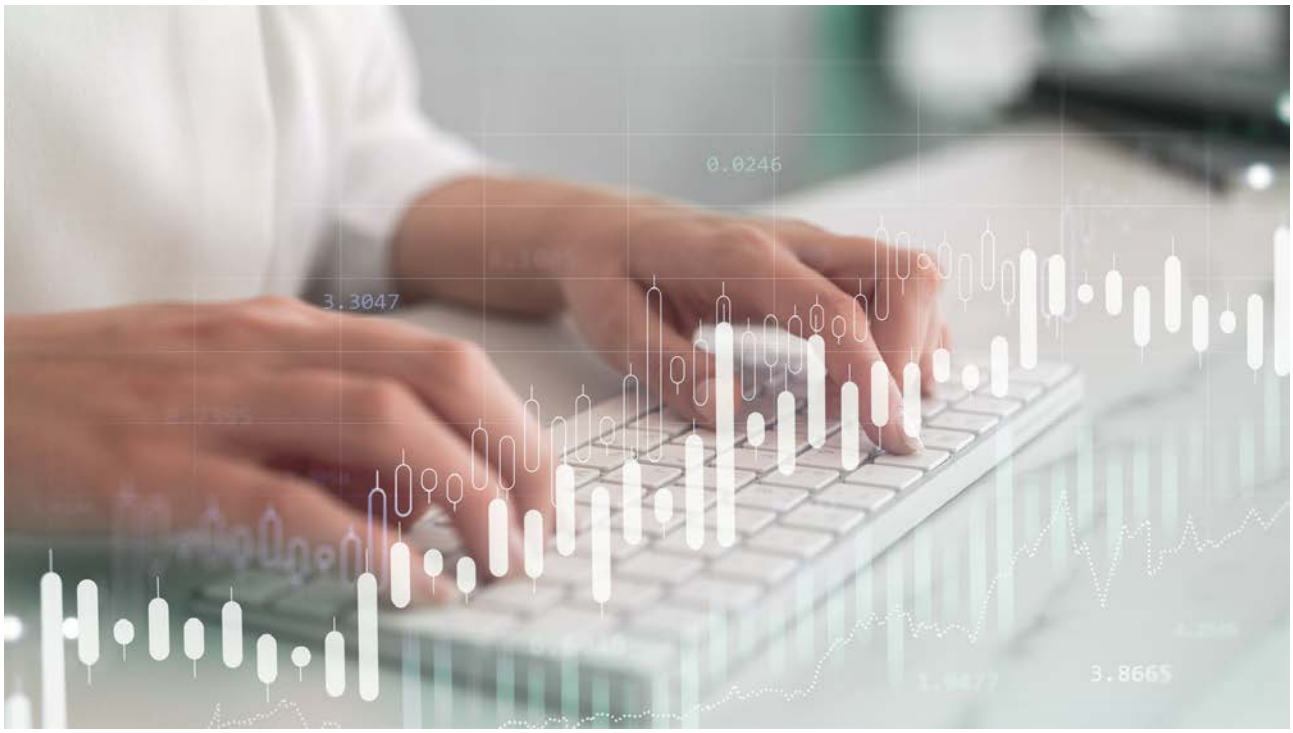
Central banks worldwide are grappling with **issues relating to data**. From how to collect and manage data to aspects of governance, analysis, communication and the proliferation of data – the vast variety of these issues is pushing many to consider root-and-branch reforms. The Bank of Lithuania has been one of the leaders in this regard.

For several years, the Bank of Lithuania has prioritized the development of **innovative solutions** for streamlining data collection and reporting. These include smart reporting solutions, such as data collection via API, new technologies enabling a switch from aggregate- to granular-level data, and new possibilities for integrating, reusing, and opening up the existing data.

Recently, we took our data management efforts to an even higher level and embarked on the fast track to becoming a truly **data-centric organisation** by launching an organisation-wide Data Management Maturity Program (DAMAMA). The program activates far-reaching change across the entire data journey within the organisation: data collection, warehousing, analytics, and data governance.

This white paper provides an in-depth guide to the recent **data management initiatives** at the Bank of Lithuania and the range of complex issues that these initiatives help to solve. In addition, this paper presents the ongoing Data Management Maturity Program DAMAMA, transformation areas covered by the program, main objectives and timelines. Lastly, the final section introduces the international context relating to the ongoing efforts of European organisations to harmonise reporting practices across different domains.

Figure 1. Data management.



Source: Adobe Stock

1. STRATEGIC PERSPECTIVE

The year 2021 saw the introduction of a first-of-its-kind **data management strategy** at the Bank of Lithuania. The new strategy is intended to ensure that data is treated and managed like an asset; it aims to create and implement a well-planned approach in handling the data created, stored and processed at the organisation.

The mission of the new data strategy at the Bank of Lithuania is to increase value created from data and to enable more timely data-based decisions.

The strategy provides a common set of **goals and objectives** across business areas and projects relating to data at the Bank of Lithuania to ensure that data is used both effectively and efficiently. The strategy also establishes common organisational methods, practices and processes to manage, manipulate and share data in a repeatable manner. Our data strategy envisions achieving reliable and high-quality data, available for easy and safe access by users who understand the value of this data and know how to employ it in their work.

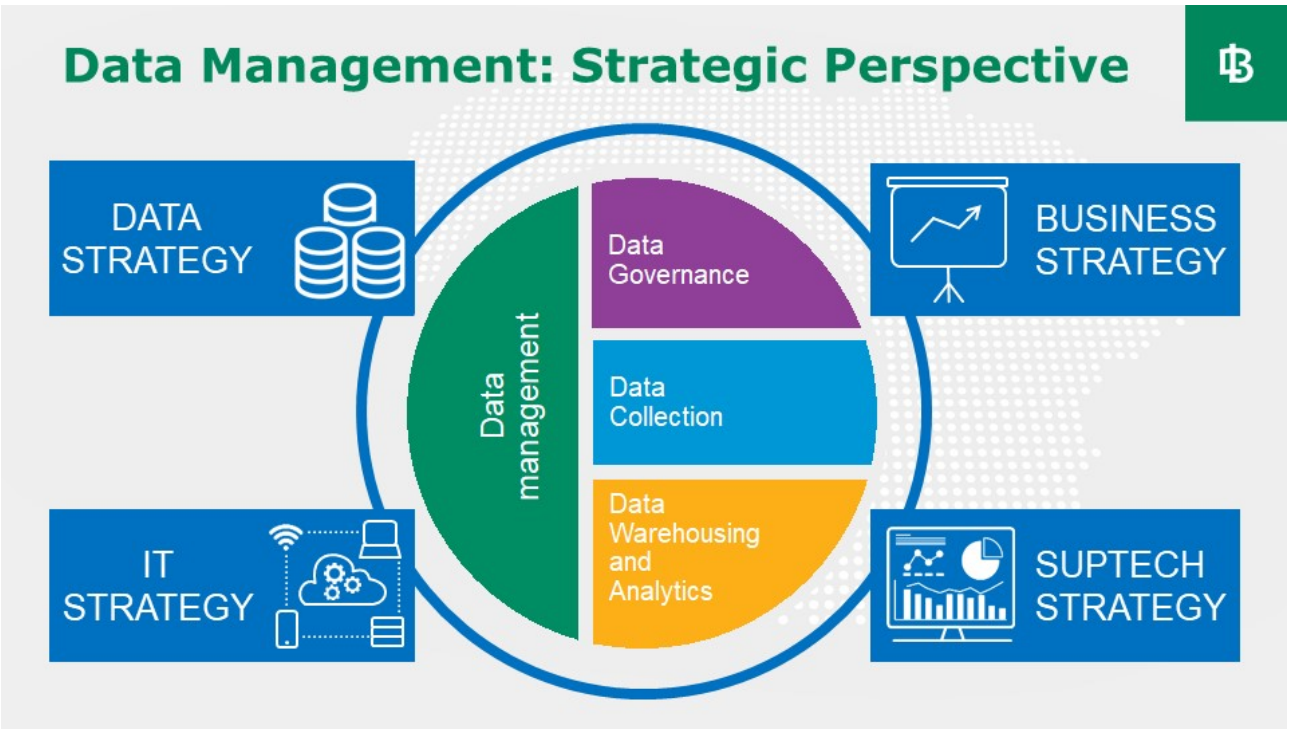
The proposed data management approach includes elements of both **defence and offence**. On the defence side, it seeks to ensure data security, privacy, integrity, quality, compliance and governance. We aim to optimise data acquisition by introducing a centralised data collection and a one-stop shop for financial institutions, to standardise data formats, to optimise data storage and access rights, and lastly – to ensure the single source of truth. On the offence side, the data management strategy envisions creating a platform for data analytics and opening wider possibilities for data science and data visualisation activities.

Figure 2. Objectives of the data management strategy of the Bank of Lithuania.

Source: Bank of Lithuania

However, the new data management strategy is not a stand-alone document. Although an overarching document dealing with organisation-wide issues, the data strategy first of all supports the Bank of Lithuania's business strategy and provides the organisation with a competitive edge. It is also cross-aligned with the IT and SupTech strategies. The data, business, IT and SupTech strategic roadmaps have a number of common aspects: people, organisational culture, technology, security, etc. This leads to some interrelated questions that have to be answered in sync: What platform(s) should we work on? How do new tools fit into the existing infrastructure? How is one to access the necessary data to empower new initiatives? How does the new technology comply with the enterprise architecture principles and security requirements?

Figure 3. Cross-alignment of different strategic layers at the Bank of Lithuania



Source: Bank of Lithuania

To address these multidimensional questions, our data management strategy **spans across several areas**: data governance, data collection, and data platform, the last of which covers warehousing and analytics. Full implementation of the envisioned approach is a complex and long-term goal which requires diverse changes : new policies, organisational transformation, and technological suite.

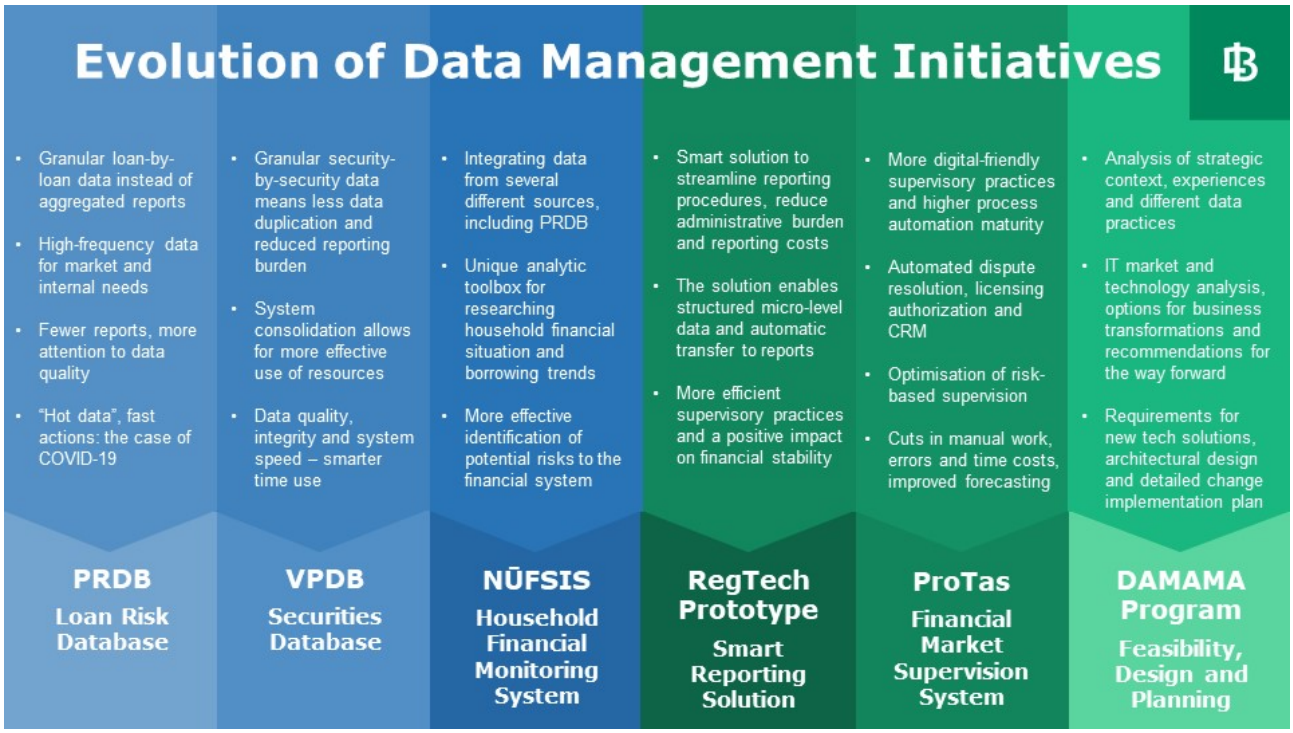
"The changing data landscape calls for reform in a wide range of areas, from the skills of individual staff members to the way data is handled. It's about everything – a new world in which data is different."

Gediminas Šimkus, Governor of the Bank of Lithuania

2. EVOLUTIONARY PERSPECTIVE

Before the launch of the complex Data Management Maturity Program (DAMAMA) in 2020 (see chapter Data management maturity program for details), most **data management projects** at the Bank of Lithuania were implemented as separate initiatives to support the organisation's strategic goals and to achieve a more effective use of resources with the help of technology. The following sections review some of the main directions that the Bank of Lithuania has recently embarked on.

Figure 4. An array of recent data management initiatives at the Bank of Lithuania



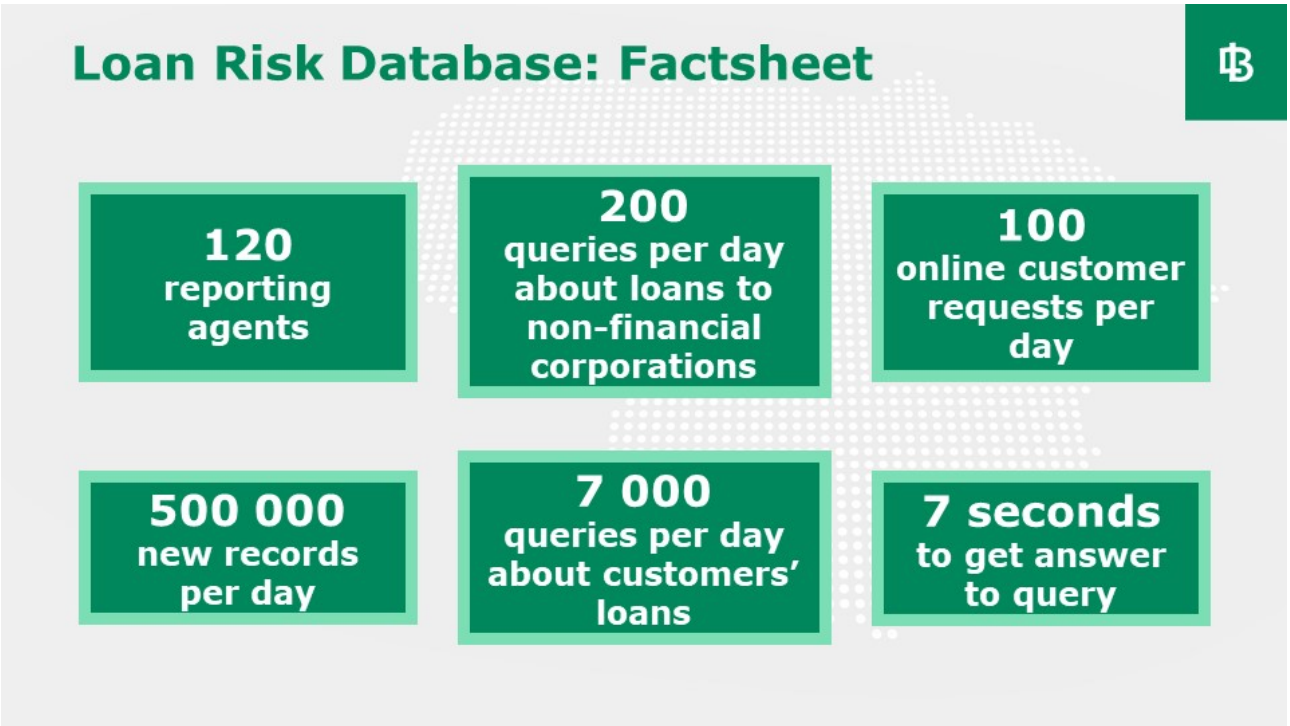
Source: Bank of Lithuania.

2.1. Loan Risk Database and Security Database: from aggregated to granular data

In 1995, the **central credit register** (CCR) of the Bank of Lithuania was introduced. Over time, the CCR has received a few facelifts; nonetheless, the changing financial market environment, emerging new technologies and expanding data needs have outgrown the old CCR solution. In line with the ECB regulation on analytical credit datasets (AnaCredit) introduced in 2018, the Bank of Lithuania has committed to implementing a brand-new CCR solution (known as 'Loan Risk Database', or PRDB), based entirely on granular data.

With the help of **granular data**, the Loan Risk Database makes it possible not only to comply with AnaCredit regulation, but also to avoid double reporting. Moreover, it enables the expansion of the currently available data access. For instance, attributes that are used for the assessment of creditworthiness are now reported within two working days, which adds value in terms of using almost real-time data and making adequate data-based decisions in time-sensitive cases (e.g., during the outbreak of COVID-19). For the purposes of AnaCredit reporting, financial market participants do not have to submit any additional returns – all the aggregates are calculated from the readily available Loan Risk Database figures by the Bank of Lithuania itself. Moreover, these figures are widely used in a variety of activities performed by the central bank itself: monitoring financial stability, financial market supervision, research activities and so forth.

Figure 5. Performance indicators of the new Loan Risk Database.



Source: Bank of Lithuania

Another example of the Bank of Lithuania's shift from aggregate to granular data reporting is the new **Security Database** (also known as VPDB). This system, which collects granular security-by-security data, reduces data duplication as well as the reporting burden to financial institutions. The new Security Database solution will allow the Bank of Lithuania to discontinue several legacy systems, which means more effective use of resources and better operational performance. By embodying the concept of a single source of truth, the new database will also offer improved data quality, integrity, and system speed. Finally, the new solution will help optimise third-party data procurement and reduce data costs without jeopardising business operations.

> *"It is better to produce micro-level data and then aggregate at one central institution. Today we still use a lot of aggregates, but we are working to minimise this."*
>
> Ramūnas Baravykas, Director, Statistics Department

The Bank of Lithuania aims to continue moving towards the **greater use of micro-data**. By collecting data in its most granular form, we will no longer need to go back to data providers for different aggregates and we will be able to better meet the informational needs of both internal and external users. Internally, expanding the scope of granular data allows us to discontinue some statistical returns, minimise data collection time, obtain real-time data and accelerate data-based decision-making. Externally, reporting institutions will gain an opportunity to redistribute their resources from report preparation to data quality assurance.

2.2. Household Financial Monitoring System: collect once, use many times

The new Household Monitoring System (or NŪFSIS) was developed with the aim of having **comprehensive integrated household data** in one central database. The new system consolidates information from the new Loan Risk Database (PRDB), Population Register, Real Property Register, State Social Insurance Fund and State Tax Inspectorate.

In the European context, Household Financial Monitoring System is a unique analytic tool for researching the household financial situation and borrowing trends in Lithuania.

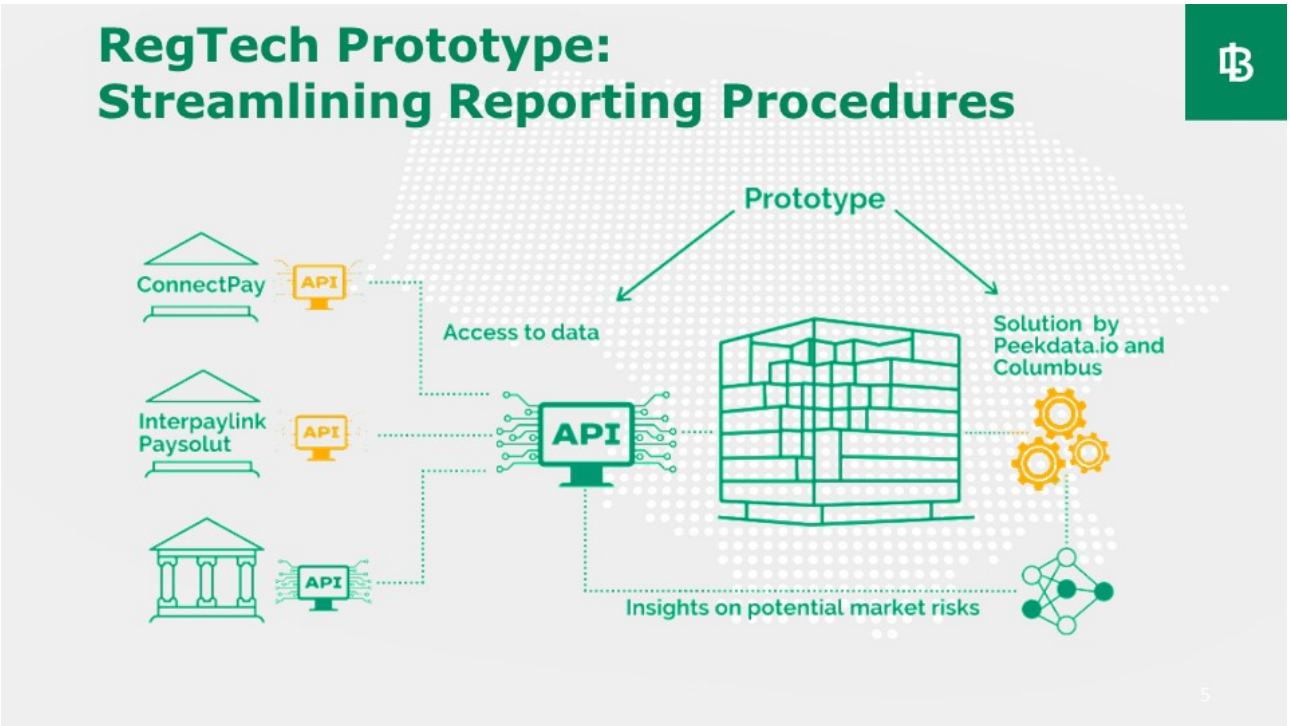
By integrating household data from several different, readily available data sources, the new Household Monitoring System allows for more effective identification of potential risks to the financial system and more frequent and accurate **data-based decisions** on macroprudential regulation. By enabling a more detailed household data segmentation, the new system also opens wider possibilities for academic research because it can profit from the detailed pseudo-anonymised data.

Generally, the integration of new granular databases with other internal data systems has enabled us to **repurpose data**, hence prioritising a smarter use of available resources and a multiform cross-domain data analysis. In the future, the Bank of Lithuania intends to continue upgrading its data warehousing technologies with the purpose of expanding possibilities for data use and integration from different in-house systems and external databases, thus facilitating wider possibilities for research and business intelligence activities.

2.3. RegTech Solution Prototype: streamlining reporting procedures

The year 2020 was marked by a significant regulatory innovation. In search of ways to reduce the administrative burden for both supervised entities and the regulator, the Bank of Lithuania launched a Regtech solution prototype, which is designed to **automate reporting procedures** and minimise reporting costs for financial market participants. Most importantly, it will open new monitoring and analysis opportunities for the regulator. This solution, jointly created by Lithuanian Tech companies and tested out in a supervised environment, is an outstanding example of private and public sector partnership.

Figure 6. Prototype of smart RegTech solution developed at the Bank of Lithuania in cooperation with Tech companies



Source: Bank of Lithuania

This new technology uses an application programming interface (API) module, which is able to automatically collect the required data from the financial institution and submit the data in a standard predetermined format to the supervisory authority. Development of the smart RegTech solution has proven the technological feasibility of simplifying reporting and **reducing reporting costs** for financial institutions. It allows the Bank of Lithuania to generate reports in a timely and accurate manner, gain insights on potential market risks, and share them with financial market participants, resulting in more efficient supervisory practices. The API technology enables structured micro-level data to be pulled from financial institutions and transferred seamlessly to reports.

"This solution is revolutionary in terms of its efficiency and accuracy. During the testing period, we used reports for anti-money laundering purposes, but the range of its application is very wide."

Ramūnas Baravykas, Director, Statistics Department

The Bank of Lithuania has already tested this solution with FinTech institutions on AML reporting. In the near future, we will be seeking to apply a similar technological concept in a broader range of reporting areas, which should ultimately simplify financial, operational and statistical reporting for financial market participants, thus moving to a micro-data exchange model and employing **API technology** for supervisory activities. Such a solution would allow financial institutions to reduce time, human resources and IT investment costs stemming from compliance with reporting requirements.

Annex 2 of this white paper provides a vision on how RegTech could evolve in the future to take the regulatory authorities towards the concept of **frictionless and** "**report-less" infrastructure**.

2.4. Financial Market Supervision System: digitalising supervision processes

Moving in the direction of more digital-friendly supervisory practices, the Bank of Lithuania is making strides to increase its **process automation maturity**. Toward that end, our Financial Market Participants and Market Behaviour Supervision System (also known as ProTas) received a facelift in 2020. The automated areas cover dispute resolution, e-licensing authorisation, feedback exchange and customer relationship management.

The new ProTas toolbox allows for the automated coordination and investigation of licensing requests, enables automated risk assessment for electronic money and payment institutions, and allows for extending analyses to employ information from other systems. This has optimised a **risk-based supervision**, reduced the administrative burden on all sides (both to financial entities and to us as a regulator) and made the whole process more satisfactory. The Bank of Lithuania seeks to see the share of incoming electronic requests and cases grow beyond 50% of total requests during the coming years.

> *"For an institution to transform from a hard-core regulator to a partner in sustainable development is not easy. And it is certainly not enough to simply say it. It takes the institution at all levels to embrace the strategic change and to deliver."*
>
> Marius Jurgilas, Member of the Board

Due to the automation of processes of dispute resolution and licensing, the amount of manual work and human error has already declined in certain supervisory procedures. As a result, the Bank of Lithuania has been able to **make cuts on time** needed to handle a single request, to reduce case-by-case fluctuations in that regard and to improve the accuracy of time estimates communicated to financial market participants.

2.5. Economic and Financial Pulse: increasing information value by sharing

The transition from aggregated data to granular real-time data was instrumental for the Bank of Lithuania at the outbreak of the COVID-19 pandemic, as it has enabled monitoring and comparing lending trends before and during the pandemic almost in real-time. At this difficult time, we also made a decision to convey this unique information to a wider public. To achieve this end and make the market information as useful and comprehensible as possible, we developed a dedicated **interactive online dashboard**, which visualises the most recent lending data in Lithuania (updated weekly).

Lending to market participants, CRR queries about customers and non-financial sector loans, flows and interest rates of new loans, renegotiated loans and more – all this information became available free-of-charge on the website of the Bank of Lithuania. Obtaining and opening this **almost real-time data** proved particularly important for economic entities when aiming to evaluate the actual liabilities of economic sectors, monitor lending volumes and trends, rapidly assess the impact, and compare lending patterns before and during the pandemic.

"In case of sudden economic shocks, the information to act on is often limited because traditional economic indicators lag behind or are too aggregated to be useful. Obtaining alternative high-frequency data at the highest granularity level, straight from the source, has the power to cover such information deficiencies with the aid of modern technology."

Gediminas Šimkus, Governor of the Bank of Lithuania

Going forward, the Bank of Lithuania is considering advancing towards a **more open data concept**, namely, publishing non-confidential or strictly anonymized granular data, which can be opened to the public in a machine-readable format. We strive to enable organisations and individuals outside the Bank of Lithuania to access, obtain and integrate this data into their analysis using different breakdowns, regardless of preferred format.

3. DATA MANAGEMENT MATURITY PROGRAM

Toward the goal of becoming a truly data-centric organisation, in 2020 the Bank of Lithuania launched an organisation-wide Data Management Maturity Program (DAMAMA). This pioneering program activates far-reaching change across the **entire data journey**: data collection, warehousing, analytics, and data governance. It also conveys the means for realisation of the central bank's data management strategy.

In 2021, the Bank of Lithuania and the initiative of DAMAMA earned the prestigious **Central Banking award** for the best Data Management Initiative. As a central bank, we assess the impact of every technological transition with extreme care in order to avoid jeopardising any of the Bank's activities. In so doing, we advance step-by-step and plan a long road ahead to reforming data management at the organisation.

Figure 7. DAMAMA program has earned Central Banking award to the Bank of Lithuania.

Source: Bank of Lithuania

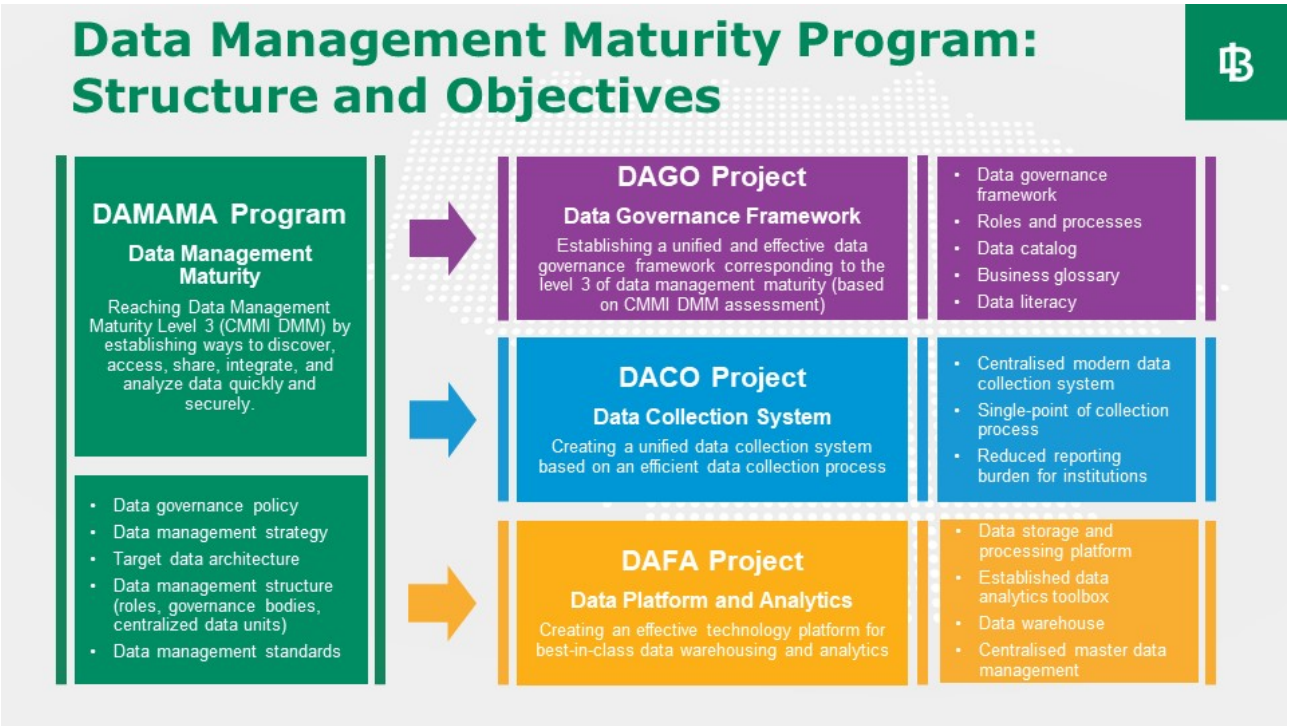
"The Bank of Lithuania has been a fast mover when it comes to updating its data infrastructure – a problem many central banks are wrestling with."

Rachael King, Chair of the Central Banking Awards Committee

In its essence, the DAMAMA program capitalises on a series of data initiatives (described in the earlier chapter Evolutionary perspective) and **proven technological concepts**, which are already yielding results. They helped the Bank of Lithuania to discontinue some statistical returns, and the amount of time spent collecting data has fallen. We will also be able to tap into new real-time data and accelerate data-based decision-making, crucial in today's fast-paced world.

At its core, the DAMAMA program consists of **three interconnected projects**, which together aim to bring organisational transformation and deploy modern technological solutions for the effective collection, sharing, integration and analysis of data. By carrying out a foundational review of our data management practices and scaling proven technological concepts, we seek to transform complex and challenging change into a source of long-term value. The program will allow us to be more agile in our data handling in the years to come.

Figure 8. Data Management Maturity Program DAMAMA at a glance



Source: Bank of Lithuania

The year 2021 will be dedicated to **planning and refining** technological, organisational and process changes envisioned under the DAMAMA program. The program will be implemented in stages and completed by 2025. At the same time, the newly established centralised data units and the new data governance bodies will begin their tasks of finalising data governance, data collection and data warehousing frameworks to full functioning. Further phases of the projects under the DAMAMA umbrella are set for launch in 2022.

3.1. Data governance: setting standards, ownership and accountability

To tackle data governance issues, we kicked off by adopting an organisation-wide **data governance policy**, followed by a data management strategy, which is to realise the principles laid out in the data governance policy within a period of 4 years. For more details, please refer to the chapter Strategic perspective.

The long-term roadmap for increasing the maturity of data management entails a fundamental rethinking of our **data governance practices**. On the one side, new technological tools (e.g., a data catalog) will be introduced to avoid data duplication, fragmentation, incompletion and other issues relating to data quality and reliability. On the other side, our organisational structure will undergo certain changes in the quest for the proper way for the Bank of Lithuania to become more data-centric.

The **organisational transformation** envisions the centralisation of core data management functions. Essentially, we are projecting a shift in performing data-related functions from a *Point-to-Point* model, where each unit addresses particular data tasks individually, to a *hub-and-spoke* approach, wherein dedicated data units play a central role. Through these central units, data would be discovered and accessed regardless of its ownership. Moreover, the data units would set organisation-wide standards for data quality assurance, and so forth.

> *"Data needs rules around it. Everyone simply can't know everything contained within an organisation's database."*
>
> Eric Avidon, news writer on data management

Data-related decisions, depending on their nature, are to be made on one of three levels: strategic, tactical or operational. The highest (strategic) level is represented by the Board of the Bank of Lithuania and is responsible for approving policies, strategies and resolutions on new data collection. To perform the activities on tactical and operational levels, two new organisational bodies are to be introduced – the Data Governance Steering Committee and the Data Governance Council. These bodies involve representatives from roles which are also to newly emerge across the Bank of Lithuania, including Chief Data Officer, Data Owners, Data Stewards, Data Architect, Data Protection Officer, Information Security Officer.

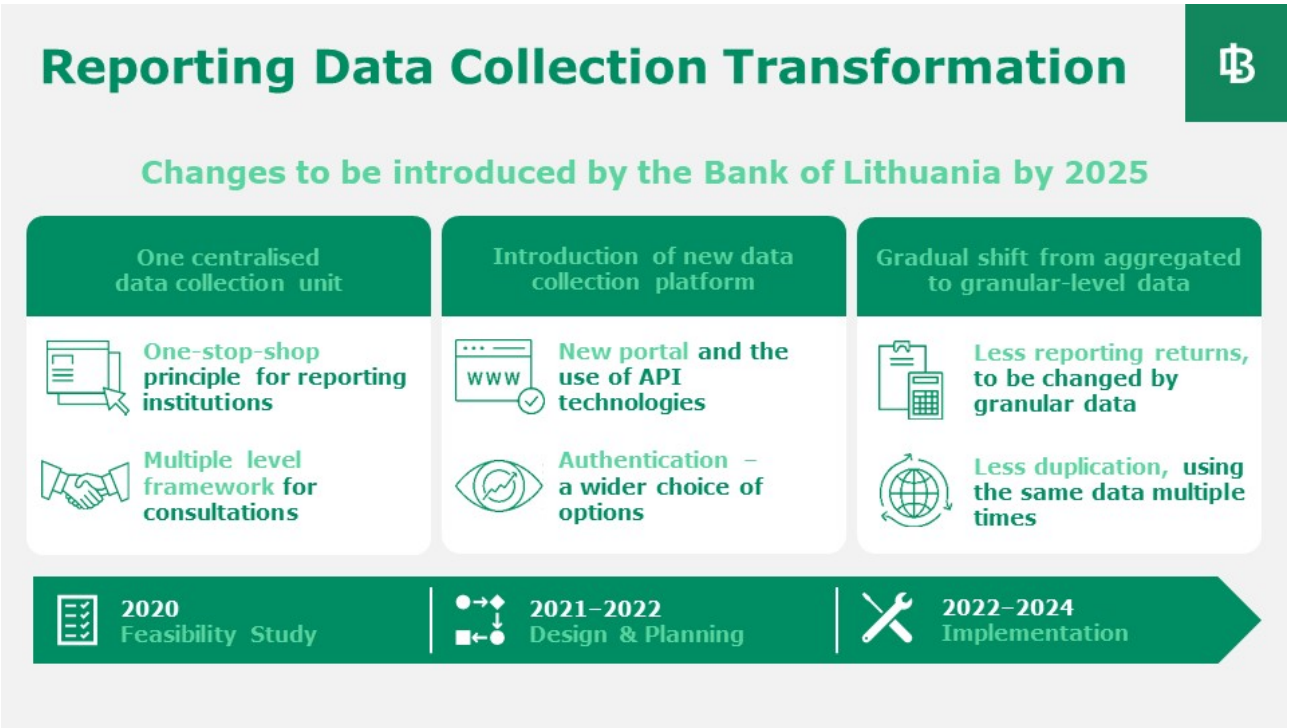
3.2. Data collection: reducing the reporting burden

Presently, the Bank of Lithuania collects most of its information using broad conventional means: aggregate reports submitted by financial institutions and data from state registers, surveys, and macroeconomic indicators. **Traditional methods** and common standards are used in data collection: financial institutions submit template-based aggregated data in XML or XBRL format; structured information from registers is obtained through system-to-system file exchange solutions; and semi-structured or unstructured information from surveys is handled using CSV or other formats, as is data from any ad-hoc exercises.

Aiming to **optimise data acquisition**, the Bank of Lithuania has an ambitious, tripartite goal: on the one hand, to introduce a one-stop shop serving reporting institutions; on the other, to create a centralised unit to deal with all issues related to data collection. In between the two, the Bank seeks to develop a new, more

functional data collection platform. At the same time, we intend to boost the scope of data collected in its most granular form. The realization of this complex goal will eliminate the need to go back to data providers for different aggregates and allow us to better meet the informational needs of both internal and external users, as we will be able to produce different data breakdowns ourselves. Please see the chapter Evolutionary perspective for an explanation of the rationale behind shifting to the collection of granular-level data.

Figure 9. Key changes in reporting data collection envisioned by the Bank of Lithuania



Source: Bank of Lithuania

3.3. Data platform: access to the right data at the right time without delays

Data integration and data storage play a critical role in climbing the ladder of data management maturity. The Bank of Lithuania strives to centralise, consolidate and strengthen its efforts in the aforementioned elements, ultimately enabling a **Data-as-a-Service** principle to operate inside the organisation. This should assist in leveraging data assets for greater business agility. In contrast, data visualisation and analytics activities would remain decentralised, promoting a *data-lab* culture and *self-service* principle in the organisation. The prevalent principle is that business and analytical units should be able to execute most data-related functions without the additional involvement of technical personnel.

"It will be an evolutionary process. Technology is only a part of the change. The human factor – the mind-shift required to convince people – is an equally significant challenge."

Ugnė Šaltenytė, DAMAMA Program Manager

Data storage is one of the most important elements of the new data platform. Essentially, it would create a **central access point** for data of all types and formats, as well as enable storage for a variety of data forms (relational, multidimensional, columnar) and purposes (including master data and referential data). Data will be stored at a data lake in the data warehouse, and any newly collected and stored data will be integrated into the common data model and accounted for in the data catalog deployed by the organisation.

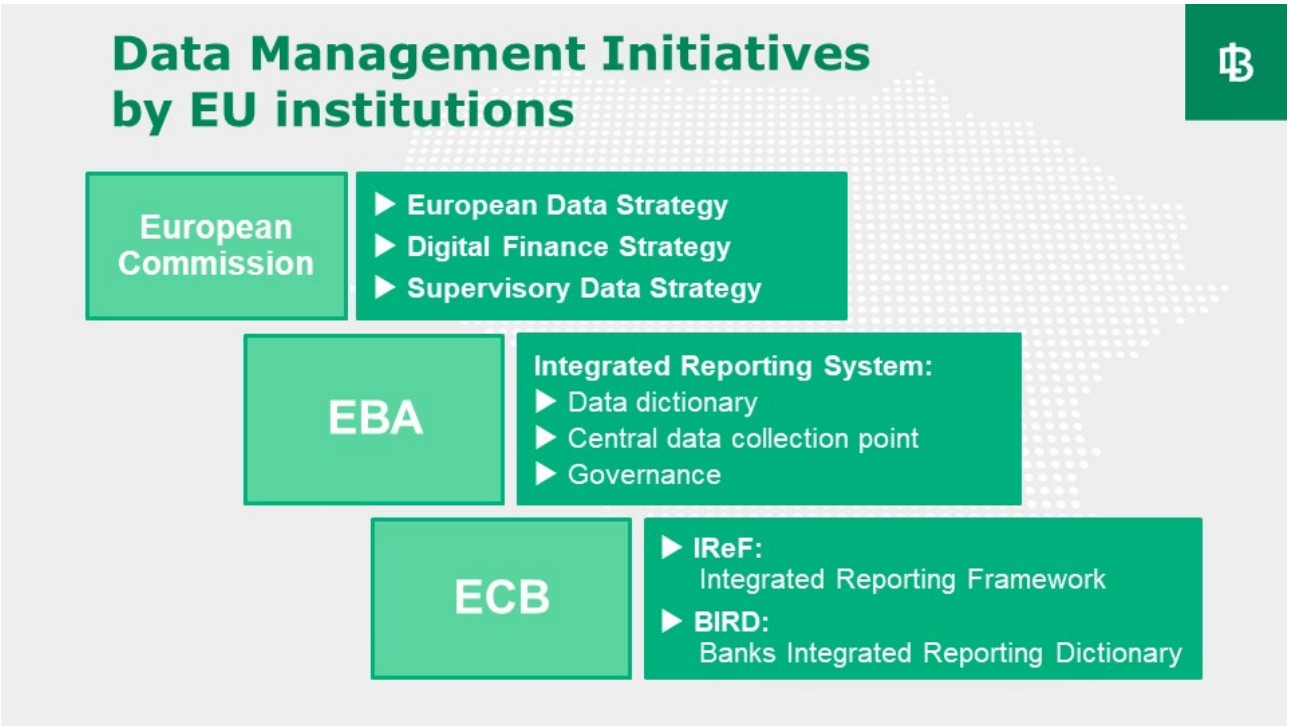
4. PARALLEL EUROPEAN DATA INITIATIVES

The current EU reporting landscape consists of **different reporting frameworks** for prudential supervisors, resolution authorities and central banks' statistics. The EU harmonised frameworks coexist with many different national and ad-hoc data requests for various purposes, initiated by a variety of different authorities.

The prevailing decentralised manner of defining reporting requirements and collecting data at the EU level is highly complex and hence leads to **reporting process inefficiencies** (such as data overlaps and duplications). The industry has therefore called for more coordination and data sharing among authorities to avoid overlapping reporting requests. The common goal of many ongoing institutional data management initiatives is to improve the effectiveness of supervision, resolution and statistical data production, while also reducing the compliance burden for institutions.

Since making a bold choice to **spearhead a paradigm shift** in its own data ecosystem, the Bank of Lithuania has been closely monitoring data management initiatives that are being harvested at the EU-level and is an active contributor via a variety of international working groups and committees.

Figure 10. Some of the major ongoing EU-level data management initiatives.



Source: Bank of Lithuania

4.1. EBA: integrated reporting system

Taking into consideration concerns over sizeable reporting costs for reporting institutions and the need to improve the efficiency of the reporting process, the European Banking Authority (EBA) has been mandated to

prepare a feasibility assessment for the development of a consistent and **integrated reporting system**[1] for statistical, resolution and prudential data.

The feasibility assessment builds on **three core areas**: a data dictionary, a central data collection point and governance. The main aim of the initiative is to streamline and increase efficiency in the different parts of the reporting process. A key building block of an integrated reporting system is the adoption of a common language (a common **data dictionary** for defining reporting requirements), so that institutions can submit a single report to all types of authorities. Currently, financial institutions report to different regulatory authorities and need to comply with multiple reporting requirements, dictionaries, standards and collection processes, all of which makes the reporting process time-consuming, unwieldy and ineffective.

Figure 11. EBA's vision for the integrated reporting system.

Source: Bank of Lithuania from the European Banking Authority

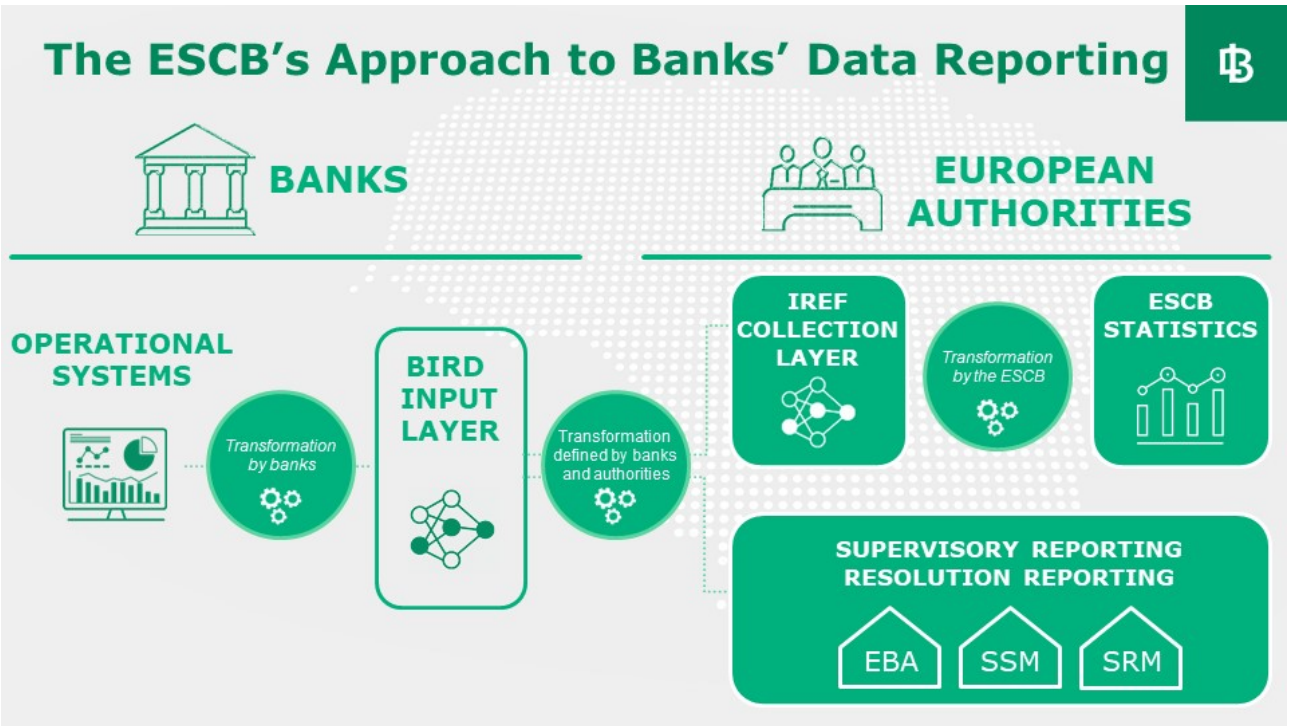
Involvement of the Bank of Lithuania. The Bank of Lithuania supports the adoption of a common European data dictionary, reporting requirements and reporting coordination process. An integrated reporting system would facilitate the creation of a single ecosystem with streamlined reporting procedures for both reporting institutions and authorities. In addition, the proposed system embodies the same guiding principle that the Bank of Lithuania strives to adopt – *define data once and report once*. In support of the initiative, we have issued the Bank of Lithuania's stance on the integrated reporting system[2], as a part of public consultation announced by the EBA in 2021. Annex 1 provides a summary of our observations and recommendations for the way forward.

4.2. ECB: Integrated Reporting Framework and Banks Integrated Reporting Dictionary

[1] https://www.eba.europa.eu/regulation-and-policy/supervisory-reporting/integrated-and-consistent-reporting-system
[2] For a full response of the Bank of Lithuania to the EBA consultation, please refer to the following link: https://www.eba.europa.eu/node/104806/submission/110354

In the area of banking data reporting, the ECB is working to develop common definitions and data models through two ongoing projects[3]. The first is the **Integrated Reporting Framework (IReF)**[4], which aims to integrate existing statistical data requirements for banks into a unique and standardised reporting framework that would be applicable across the euro area. Achieving this would simplify reporting processes by ensuring data collection only once via an integrated scheme that European authorities could then use to generate specific analysis and reports and reduce ad-hoc data requests. IReF focuses on ECB regulatory requirements on balance sheet items of monetary financial institutions and interest rate statistics, securities holdings statistics and bank loan reporting (AnaCredit). The current roadmap estimate is to have the IReF implemented between 2024 and 2027.

Figure 12. Role of IReF and BIRD frameworks for banks' reporting process



Source: Bank of Lithuania from the European Central Bank

The second project is the **Banks Integrated Reporting Dictionary (BIRD)**.[5] This project aims to help banks organise information stored in their internal systems more efficiently in order to better fulfil their reporting requirements. BIRD is a harmonised data model that precisely describes the data to be extracted from the banks' internal IT systems when producing reports required by authorities. BIRD currently covers reporting requirements of AnaCredit and the group module of ECB statistical reporting of securities holdings, as well as financial reporting (FINREP). The coverage of Common Reporting (COREP), asset encumbrance and resolution planning is currently under development.

Involvement of the Bank of Lithuania. For now, the representatives of the Bank of Lithuania are contributing to shaping IReF through our involvement in the ESCB's task teams and a pilot project for jointly collaborating on "one collection platform". We see IReF as a focal point – once developed, it would support

[3] https://www.ecb.europa.eu/stats/ecb_statistics/co-operation_and_standards/reporting/html/index.en.html
[4] https://www.ecb.europa.eu/pub/pdf/other/ecb.escbirefoverview202011~ebb404b7b6.en.pdf
[5] https://www.ecb.europa.eu/stats/ecb_statistics/co-operation_and_standards/reporting/html/bird_dedicated.en.html

BIRD by establishing a common collection layer for statistical data from banks across euro area countries. Banks would thus be able to directly use BIRD for their statistical reporting without national adjustments.

4.3. European Commission: European data strategy, digital finance strategy and supervisory data strategy

In 2019, the European Commission performed a **fitness check**[6] of prudential reporting requirements in the EU financial services legislation. The fitness check identified five areas where there is scope to further simplify and streamline the reporting process:

1. Improve the legislative design of primary legislation
2. Assess the data needs and uses
3. Greater consistency and harmonisation
4. Governance related to further coordination at earlier stages of the reporting process and data sharing between authorities
5. Technological developments that could provide new opportunities to streamline the reporting process

Based on the findings of the fitness check, the European Commission is performing a **follow-up study**, in order to set forth a long-term vision for moving from the current system of prudential reporting to a modern, efficient and effective reporting process. The aforementioned EBA work on the integrated reporting system will also contribute to the assessment performed by the European Commission on the long-term action plan for an efficient reporting process.

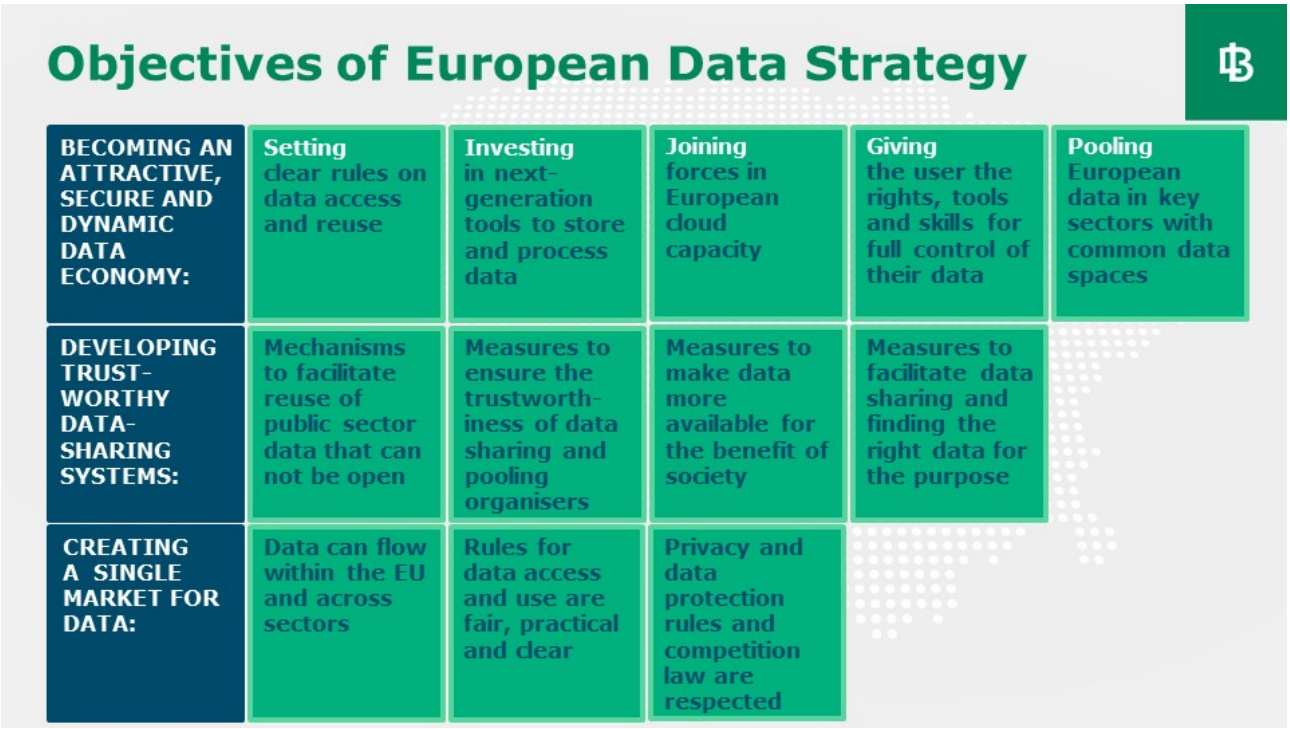
The European Commission has launched several targeted initiatives around data: European data strategy, digital finance strategy and supervisory data strategy.

In its **European data strategy**,[7] the European Commission aims to make the EU a more competitive data economy globally by creating a single market for data, which would allow data to flow freely within the EU and across sectors. This single data market would benefit businesses, researchers and public administrations, as well as individuals and organisations, who would be empowered to make better decisions based on insights from non-personal data. The European Commission recommends setting up common European data spaces in specific sectors.

Data governance is a key pillar of the European data strategy. This pillar aims to increase trust in data sharing, strengthen mechanisms to increase data availability, and overcome technical obstacles to the reuse of data. New mechanisms, measures and regulations will support the set-up and development of common European data spaces in strategic domains involving both private and public players, such as the finance sector and public administration.

[6] https://ec.europa.eu/info/sites/default/files/business_economy_euro/banking_and_finance/documents/191107-fitness-check-supervisory-reporting-staff-working-paper_en.pdf
[7] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0066&from=EN

Figure 13. European data strategy at glance



Source: Bank of Lithuania from the European Commission

Digital finance strategy[8] spells out the approach aimed at establishing a common data space in the financial sector and sets a roadmap for supporting the digital transformation of European finance in the coming years, while regulating its risks. To that end, the main priorities are seen as follows: removing fragmentation in the Digital Single Market; adapting the EU regulatory framework to facilitate digital innovation; promoting a data-driven finance; and addressing the challenges and risks with digital transformation, including enhancing the digital operational resilience of the financial system.

By making **rules more digital-friendly** and ensuring consumer protection, the European Commission aims to leverage synergies between highly innovative start-ups and established firms in the financial sector, while addressing associated risks. Boosting digital finance and creating a facilitative regulatory framework would benefit not only European data-driven innovations, but also reinforce the capacity of European and national regulatory authorities to supervise and avoid risks in the financial system, thereby better safeguarding financial stability.

[8] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0591&from=EN

Figure 14. Structure and benefits of digital finance strategy for Europe

Source: Bank of Lithuania from the European Commission

A supervisory data strategy[9] contributes directly to the implementation of the European data strategy and the digital finance strategy. It aims to improve the collection of supervisory data and make it fit for the future. The focus is on data reported to the EU and national regulatory authorities for the supervision of the EU financial service system. The strategy envisions a more proactive and effective data-driven supervision, which would help ensure the integrity and stability of the EU financial system and reduce the cost and burden associated with reporting.

Supervision of the EU financial system relies on data that is timely, relevant and of high quality. The volume and **complexity of the data** required to oversee the financial system have grown substantially over the last decade. In parallel, there has been a rapid evolution of **digital technologies** to collect and analyse such data. The supervisory reporting framework and the way authorities collect and use data needs to keep pace with these developments.

Involvement of the Bank of Lithuania. Our stance is in favour of the European Commission's data strategies and the general lines that they set for creating trustworthy common data spaces supported by clear and fair data governance rules. The timely adoption of new approaches and legislation would benefit and speed up the Bank of Lithuania's own data management changes, particularly related to collection and analytics of reporting data. As a central bank, we seek to have a tangible input in each of the aforementioned initiatives of the European Commission. The Bank of Lithuania is involved in experience-sharing with the European Commission toward the goal of the overall data strategy being modern, effective and reflective of the needs of regulatory authorities and financial market participants.

[9] https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13023-EU-financial-system-supervisory-data-strategy_en

ANNEX 1: STANCE OF THE BANK OF LITHUANIA ON THE EBA INTEGRATED REPORTING SYSTEM

On 11 March 2021, the EBA published a discussion paper that dealt with the feasibility report on integrated reporting. The EBA discussion paper presents a preliminary analysis and options on the feasibility of creating an integrated reporting system for statistical, resolution and prudential data, as envisaged by Article 430c of the Capital Requirements Regulation (CRR). The Bank of Lithuania, along with other stakeholders, was invited to exchange views on the proposed approach and the topics presented. The following sections correspond to sections in the EBA discussion paper[10] and summarise the stance of the Bank of Lithuania on the corresponding topics[11].

Reporting process

- The priority and initial scope of the integrated reporting system should be on credit institutions.
- It would be most efficient to begin with the European (IReF, EBA, ESA) and international (BIS, IMF) data collections. However, the most meaningful benefits would be achieved by assessing and including national-level data collections.
- Among the four main phases of the reporting process (data dictionary, data collection, data transformation and data exploration), we agree with the proposed holistic approach for the data dictionary and data collection, particularly on the semantic and syntactic levels. However, regarding data exploration and, partially, data transformation, we see the proposed approach as going beyond the productive scope of an integrated reporting system. In our view, every reporting authority should be able to decide on its own how data exploration is implemented, how many different data schemas are used and what tools should be employed in the process.

Data dictionary

- The definition and implementation of a standard data dictionary is a necessary precondition for the successful implementation of the EBA integrated reporting system.
- It is especially important that the data dictionary enables the use of API technologies and digitisation, in this way opening up possibilities for more extensive reliance on automation technologies (e.g. machine-to-machine). It is therefore crucial to ensure unique and overlap-free definitions of the reporting requirements as well as to develop these definitions in cooperation with financial market participants and legislators.
- The data dictionary should be formulated in a language and overall manner that is comprehensible to financial market participants. In addition, it should feature data codes to ensure correct references to data. The data dictionary should also allow the identification of which reporting domain the datapoints are relevant to. A standardised data dictionary would help institutions to significantly improve reporting processes, including understanding reporting regulations, extracting

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10 https://www.eba.europa.eu/sites/default/documents/files/document_library/Publications/Discussions/2021/Discussion%20on%20a%20Feasibility%20Study%20of%20an%20Integrated%20Reporting%20System%20under%20Article%20430c%20CRR/963863/Discussion%20Paper%20on%20integrated%20reporting.pdf

11 For a full response by the Bank of Lithuania to the EBA consultation, please refer to the following link: https://www.eba.europa.eu/node/104806/submission/110354

data from internal systems, processing data (including data reconciliation before reporting), exchanging data and monitoring regulators' feedback, and preparing regulatory disclosure compliance.

- The data dictionary should be unique and standardised for all regulatory data, with the aim of ensuring consistent use across supervisory, resolution and statistical reporting. Even more notable cost-reductions could be expected if it were possible to integrate the national regulatory reporting regulations and the harmonised international reporting regulations in one unique data dictionary.
- We would expect that integrating the national reporting level would help to achieve cost reductions on two fronts: (1) by reducing the overall reporting burden for reporting institutions, and (2) by empowering a more effective reuse of data and hence reducing the amount of data that needs to be collected, stored and managed.

Data granularity

- To enable SupTech and RegTech in a data-driven economy, standardisation should receive significantly more attention in regulatory reporting. Technological solutions tend to appear where there are data and standardised protocols. Data must be structured in such a way that the technology could use it and create value based on that data.
- The current reporting mechanism, which is based on the submission of aggregated data, does not fit the context of continuously changing reporting requirements. As a result, micro-data-based reporting should be expected to gain a breakthrough in the near future, particularly since a continuously changing reporting regime entails significant costs for both financial market participants and supervisory authorities. It is therefore vital to find a way to adapt to these changing data needs without imposing acute cost increases, while at the same time minimising the burden.
- In the statistical domain, the collection of granular data would allow a centralised (and therefore more effective) derivation of data aggregates. Shifting the data compilation effort from reporting agents to statistical authorities would allow for a more standardised approach and more consistent data. Somewhat conversely, in the supervisory reporting domain, reporting institutions should remain responsible for the calculation of certain key prudential ratios and limits. These indicators need to be extremely accurate, since they serve as the basis for prudential decisions and actions. National supervisors monitor the ability of credit institutions to calculate and report accurate data, as part of the assessment of internal governance within the Supervisory Review and Evaluation process (SREP).
- Although the reporting of granular data is both highly desirable and feasible, the need to collect key aggregates is likely to remain in both statistical and prudential reporting domains. For instance, prudential reporting covers a number of key data points that need to be reported on an aggregate level in order to comply with regulations, or compilations of these data points require the input of expert judgement. In these cases, among others, the provision of granular data in lieu of aggregates would not be feasible.
- Certain additional challenges for granular data reporting also stem from different calculation methods and models used in supervisory reporting and classification of securities and loans, as well as credit risk assessment models with different assumptions. If the data dictionary succeeds in integrating supervisory data definitions in such a way that the data is clearly identifiable,

unique, overlap-free, and attributable to specific books, asset classes, use cases, etc. – it would be possible to seek the highest data granularity level.

- Moreover, the compilation of financial statements and other accounting data reported by credit institutions is subject to a degree of discretion and expert judgement which cannot be delegated to prudential authorities. This means that, unlike in the statistical field, the submission of prudential data at the granular level is not enough, as it must be accompanied by the relevant prudential and accounting aggregates.
- Nonetheless, in our opinion, a major part of reporting data should still be collected at the granular level (as opposed to the aggregated level). If the proportion of data collection shifts towards a larger share of aggregate data, the costs of introducing granular data collection could exceed the benefits, which would make the solution ultimately not worth implementing.
- The main benefits of implementing granular data collection are related to the reduction of resubmissions, as well as to possibilities of further cross-country harmonisation and standardisation, levelling the playing field in the application of the requirements, simplifying the internal reporting process, and reducing the complexity of the reporting requirements.

Central data collection point (CDCP)

- CDCP is an important advancement. However, our view is that data collection should be centralised on a national level (as opposed to a harmonised international level), featuring a single national data collection point (single country, single point of collection).
- From the perspective of reporting institutions, there is no significant difference between reporting through a national data collection point or through an international CDCP. However, there are several considerable obstacles to pursuing a fully centralised direct international CDCP concept: a legacy of several layers of reporting, at national and international levels; primary European law; and the difficulties in financing of a central data collection point. All these factors argue against pursuing such international centralisation in the near future.
- In terms of system design, we consider a hub-and-spoke approach as the most suitable on an international level. It has the advantage of not interfering with any data collection or data management processes and related decisions that have been made (or are planned in the future) by the national competent authorities. A centralised approach, by contrast, could potentially escalate risks related to a single point of attack. This approach would also be complicated to implement due to considerable national differences and a variety of reporting processes and systems. On a national level, however, the data collection approach is not as critical, as long as there is a well-defined and properly executed data dictionary in place.

Push vs. pull approach

- In our view, national authorities should be able to collect data on their own terms (either a pull or a push approach, or a combination of both) through single national data collection points. The EBA, in turn, should collect data from national authorities using a pull approach, since on the national level information would be stored in a standardised and unified way. In order for the pull approach to work, clear and explicit rules are required, as well as a framework in place to ensure data quality.

- Some reporting requirements tend to be event-based rather than according to a predefined schedule. This kind of reporting should be done based on a push approach. Supervisory authorities would be responsible for taking actions to collect data from reporting institutions. European authorities would then be able to pull such data according to their needs.
- In any case, reporting agents should remain responsible for the quality of data they report, regardless of chosen approach. This includes the quality of data aggregates as well.

Technology

- Data collection and data exploration are the two reporting processes that would benefit most from the development of regulatory technology (RegTech). The Bank of Lithuania is strongly in favour of RegTech and will continue to invest in its development, with the aim of achieving optimal solutions for all stakeholders – both reporting authorities and financial market participants.
- RegTech solutions could help to combine different types of data, e.g., quantitative (structured) information with textual (unstructured) reporting information. This would also allow tracking and employing information from sources other than reporting institutions, e.g., media information. If reporting requirements and quality checks are defined in a machine-executable language, automated systems could be put in place to perform the sending, checking, integration and dissemination of data.
- RegTech has the potential to take European reporting beyond what is proposed in the EBA's integrated reporting system. With the help of RegTech, national and international supervisors could partner with financial market participants. Alongside making decisions and providing recommendations, they could also offer advanced supervisory solutions. Streamlined access to financial market information would lead to the faster, more accurate identification of market patterns, and regulatory decisions could be technologically embedded in the business logic, allowing for more targeted action in response to certain events.

ANNEX 2: A VISION FOR "REPORT-LESS" REPORTING

The introduction of new regulatory technology has power to radically alter the reporting process and achieve a paradigm shift in the industry. This could potentially mean a turning point for supervisory reporting as we know it, ultimately leading to frictionless access to supervision data and eliminating the need for periodical reporting returns altogether.

The key to such future-forward regulatory reporting is developing API-based "sensors" for reporting purposes that could be deployed by financial institutions and other reporting agents. These sensors would serve as a common semantic layer and external interface for supervisors and regulators across financial institutions. Based on the Bank of Lithuania's experience, sensors could be installed in the IT infrastructure of financial institutions. Each financial institution would have to internally develop a process to feed these sensors with the data, namely, to set up a standardised API. There could be two types of sensors: 1) sensors allowing supervisors and regulators to pull data from financial institutions in real time; 2) sensors that would be able to push alerts to supervisors or regulators upon occurrence of certain events in real time.

The proposed technology would enable monitoring of events related to deposits, loans, payments or risks, or even transaction-level information. It could send data and alerts in real time to supervisors and regulators, enabling them to observe the "health" of any financial institution(s) in real time – thereby acting as an early-warning tool. Sensors would allow supervisors and regulators to obtain structured micro-level data and automatically transfer this data to required reports (in a specified format and manner).

Once the full application of API-based sensor technology was completed, considerable parts of regulatory reporting could be streamlined to the point where supervisory authorities themselves would be able to produce insights using different data breakdowns. Transferring the data compilation effort from financial institutions to supervisors would reduce the costs and challenges of ever-changing reporting requirements to financial market participants. In addition, by having access to the real-time data stream from any financial institution(s), supervisors and regulators would be able to make use of advanced anomaly detection techniques (e.g., based on machine learning) in order to identify unusual developments – anomalous events that might require extra attention.

The proposed reporting schema would essentially mean an evolution of approach from principle-based to insight-based supervision. It would enable national and international authorities to gain real-time insights on potential financial market risks, hence rendering the financial supervision process more effective and making a positive impact on ensuring the stability and soundness of the financial system.