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FINANCIAL FLASH REPORT: USING SAF-T DATA TO DRIVE DECISION-MAKING IN CONSULTING

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Internship plan

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Resumo

Os relatórios financeiros em tempo real desempenham um papel importante no atual contexto orientado para a utilização de dados, no qual a melhoria do desempenho empresarial exige informações rápidas e precisas. Estas ferramentas são essenciais para detetar alterações no desempenho, analisar o estado financeiro das empresas e apoiar um planeamento proativo.

O presente relatório descreve o estágio realizado no departamento financeiro da Numya Network, Lda. e foca-se no desenvolvimento de um *Financial Flash Report* (FFR)–um *dashboard* concebido como uma ferramenta de inteligência de negócios destinada a fornecer indicadores críticos e específicos para apoiar a tomada de decisão dos serviços de consultoria da Numya.

Através do uso do *software* Microsoft Power BI e a dados extraídos de ficheiros SAF-T, o *dashboard* transforma informação contabilística em indicadores precisos com visualizações interativas. O FFR é composto por várias páginas que fornecem informações através de indicadores-chave (KPIs), tais como de liquidez, solvabilidade, rentabilidade, fiscal, eficiência operacional, bem como representações dinâmicas do balanço e da demonstração de resultados.

Embora não tenha sido ainda formalmente validado, o FFR pode reduzir o tempo de elaboração de relatórios e permitir uma tomada de decisão mais rápida e informada.

Em suma, o FFR tem como objetivo fornecer à equipa de consultoria da Numya uma visão clara, abrangente e prática sobre o estado financeiro das empresas sob consulta, melhorando as tomadas de decisão e contribuindo para o seu crescimento sustentável.

Palavras-chave: Tomada de decisão; Consultoria; Financial Flash Report; Power BI; SAF-T(PT)

Abstract

Real-time financial reports play a vital role in today's data-driven environment, where performance improvement urges for timely and accurate information. These tools are essential for detecting early shifts in performance, analyzing a company's financial position, and supporting proactive planning.

This internship, carried out in the finance department at Numya Network, Lda. focused on developing a Financial Flash Report (FFR) dashboard - a business intelligence tool designed to provide critical, targeted metrics to support decision-making for Numya's consulting services.

Using Microsoft Power BI and data extracted from SAF-T (PT) files, the dashboard converts raw accounting data into precise metrics presented in interactive visualizations. The resulting FFR comprises multiple pages that deliver insights through Key Performance Indicators (KPIs) such as liquidity, solvency, profitability, tax metrics, and operational efficiency, along with dynamic representations of the balance sheet and income statement.

Although the tool has not been formally validated, it has the potential to reduce reporting time and enable faster, and more informed decision-making.

In summary, the FFR aims to offer clear, comprehensive, and actionable insights to Numya's consulting team about the financial health of its client's companies, enhancing strategic decisions and contributing to sustainable performance improvement.

Keywords: Decision-making; Consulting; Financial Flash Report; Power BI; SAF-T(PT)

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List of Acronyms

AI - Artificial intelligence

API - Application programming interface

BdP – Banco de Portugal

BI – Business intelligence

BPM - Business process management

BSC – Balance scorecards

CCC - Cash conversion cycle

DPO - Days payable outstanding

DSO - Days sales outstanding

EBIT - Earnings before interests and taxes

EBITDA - Earnings before interests, taxes, depreciation and amortization

EBT – Earnings before taxes

FASB – Financial accounting standards board

FFR – Financial flash report

FR – Financial report

GAAP - Generally accepted accounting principles

GASB - Governmental accounting standards board

IASB – International accounting standards board

IES - Informação empresarial simplificada

IFRS - International financial reporting standards

KPIs – Key performance indicators

PCEA - Portuguese classification of economic activity

ROA – Return on assets

ROE – Return on equity

ROI – Return on investment

SAF-T - Standard audit file for tax purposes

SMEs - Small and medium-sized enterprises

SNC – Sistema de normalização contabilística

XML - Extensible markup language

1. Introduction

In an era where data increasingly drives strategic decisions, transforming raw financial and accounting data into actionable insights through a dynamic dashboard represents a valuable opportunity. The success of modern companies depends more than ever on their ability to use data effectively to support timely and informed decision-making, ensuring competitiveness in a fast-changing environment (Bumblauskas et al., 2017). Research shows that integrating technological tools into financial reporting not only increases speed and accuracy but also streamlines processes across organizations of all sizes (Yang et al., 2022). This transformative potential - particularly its capacity to offer a competitive advantage for client companies - served as the motivation for the internship activities developed at *Numya Network* and, by extension, for this academic report.

This report presents and reflects on the internship experience at *Numya Network*, a Portuguese company operating in the financial sector, offering services in accounting, auditing, and financial consulting. The company serves clients from nearly all continents, with a particular focus on small and medium-sized enterprises (SMEs). During the three months of internship, from early February to the beginning of May 2025, I participated in a cross-functional environment that spanned multiple departments.

The main goal of the internship focused on the design and development of a sophisticated and ambitious Financial Flash Report (FFR) –a dynamic dashboard built in Power BI – for internal use and client support. The project involved integrating extensive financial research with accounting data to create interactive dashboards tailored to the specific needs of management. The FFR provides a clear, real-time overview of a company's financial health and operational activity, supporting strategic decision-making for consultancy services. However, its development raised important questions on the limitations of Power BI, and SAF-T (Standard audit file for tax purposes) data extraction quality.

Unlike traditional financial reports (FR), the FFR was precisely designed to offer a professional, clear, and organized content view with actionable and accurate indicators, facilitating more relevant insights. Although developed as a generalized model, it was tested using data from an actual *Numya* client (whose identity is withheld for confidentiality). The data originated from SAF-T files, which required extensive data organization and cleaning due to their large volume and complex structure. Additionally, the dashboard anticipates future integration with sectoral benchmarks from Banco de Portugal (BdP), though this feature could not be implemented during the internship period.

A key differentiating feature of the FFR is its dual applicability: internally–by enabling Numya's consultants and auditors to prepare financial reports more efficiently and faster enhancing clients' service–, and externally by empowering clients to independently analyze their performance using data-driven insights. This flexibility suggests future potential for monetization, positioning the FFR as a value-added product for Numya´s clients.

The dashboard was initially prototyped using Figma to align expectations with Numya's managers - using ad hoc numerical data to simulate functionality - which led to several design revisions. However, the development process of this FFR was not without challenges. Extracting and processing SAF-T data and integrating it into a functional Power BI dashboard required advanced analytical and problem-solving competencies, particularly given the data's size and complexity, which caused some technological constraints. Overcoming these obstacles demanded the application of data processing and data modeling skills using DAX queries and M language, alongside theoretical knowledge in financial accounting.

Moreover, the Association of Chartered Certified Accountants (n.d.) highlights the complexity of this topic and the current gap of consolidated information, underscoring the relevance and innovation of this initiative.

This report is structured into six sections. The first is the current section where the contextualization of the internship's goal and its report structure is developed. Section 2 provides an overview of *Numya Network's* organizational context, industry positioning, and sectoral analysis. Section 3 details the methodological (step-by-step) development of the FFR - from SAF-T data extraction to dashboard implementation -highlighting the applied technical and analytical competencies. Section 4 offers a literature review that guides the dashboard's design. Section 5 provides a critical view of the FFR developed, discussing current limitations, technical challenges, and its future potential scalability in Numya's consulting services. Finally, Section 6 outlines the main conclusion and contribution of the internship activities, namely the FFR as the core subject and output, both to Numya and to the wider field of financial consultancy.

2. The Company & Sector

2.1. An Overview

Numya Network Lda. (hereinafter "*Numya*") is a collaborative business group founded in 2019, with the objective of providing consultancy, audit, management, and other specialized services. The company has established a solid presence in the Portuguese business services sector by adhering to high technical and ethical standards, fostering long-term partnerships, and adopting a risk mitigation strategy tailored to companies with aligned values.

Currently, Numya encompasses two core entities: LCircle – Advisory and Consulting (established in 2018), and Numya – Accounting and Outsourcing (founded in 2013), both operating under the umbrella brand Numya Finance. See Figure 1 below.

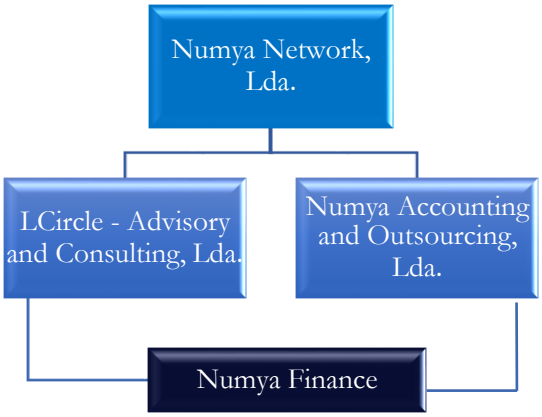

***Figure 1**- Representative chart of Numya's Structure*

Headquartered in Porto, these entities specialize in accounting, finance, audit, and tax advisory, offering tailored business solutions to meet diverse client needs. Each of the group's companies operates as a legally independent entity and conducts its professional activities autonomously, without representing the wider network. Therefore, Numya cannot be held liable for the actions or omissions of its member firms in the execution of their professional duties.

In addition to its core areas, Numya is actively expanding into complementary fields such as legal, environmental, engineering, and digital services. This strategic diversification is aimed at enhancing the group's ability to deliver integrated, specialized solutions, while reinforcing its responsiveness to market demands and its overall financial performance.

2.2. Numya's Financial Indicators

Understanding the evolution of Numya's business requires a closer look at how its key financial indicators have performed over time. From 2019 to 2023, the company's financial profile reflected both its entrepreneurial growth and the external pressures of a challenging economic context. See Figure 2 below.

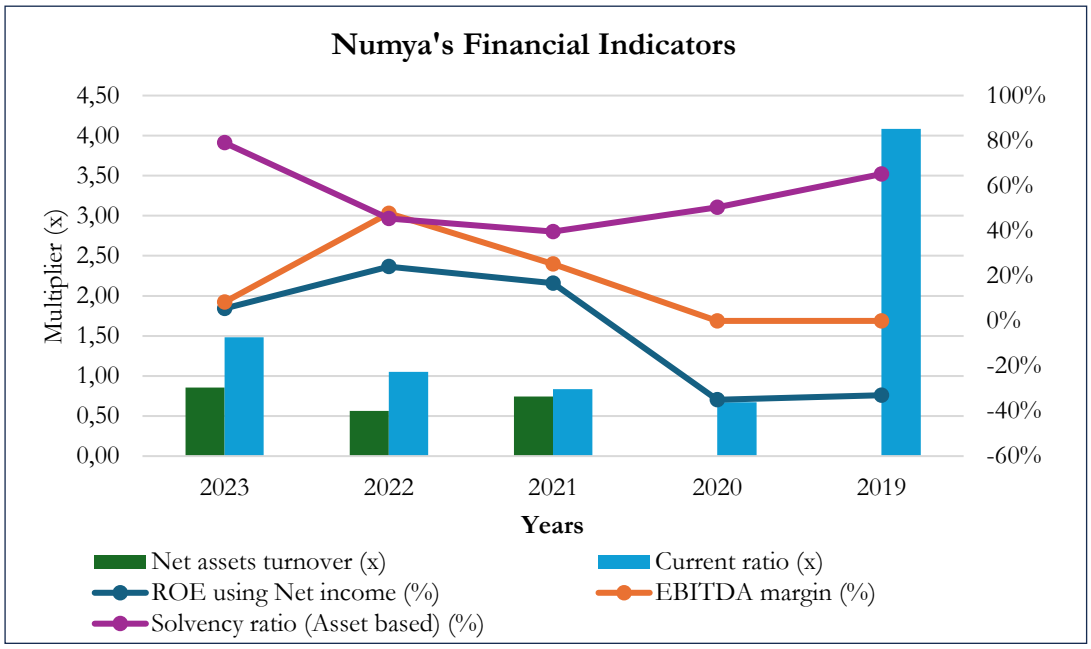

***Figure 2**- Numya´s Financial Indicators*
Data Source: Orbis & Sabi

By dividing the current assets by the current liabilities, the current ratio is a liquidity ratio that provides information about the company's ability to pay its short-term obligations. This ratio provides the result as form of a multiplier (x), for instance, that ratio began at a robust 4.08 in 2019, signaling a comfortable liquidity position at the outset. However, by 2020, this figure had dropped sharply to 0.67 -a shift likely tied to the impact of the COVID-19 pandemic and the pressures it imposed on short-term assets. In the following years, signs of recovery emerged, and by 2023, the ratio had returned to 1.48, supported by an estimated average annual growth rate of around 30%. This rebound suggests a growing capacity to meet short-term obligations and improved internal resource management.

As the company matured, asset efficiency stabilized. As same as current ratio, the net assets turnover ratio - computed by dividing the operating revenue by shareholders funds and non-current liabilities- results in a multiplier (x) which remained relatively constant from 2021 to 2023. While earlier low levels can be attributed to Numya's start-up phase and a

sluggish economic environment, the recent stability indicates a more structured and consistent approach to the use of assets. In parallel, the solvency ratio - an indicator of long-term financial health, and calculated by dividing shareholders' funds by total assets - followed a more gradual evolution. After decreasing to 40% in 2021, it recovered to 79% by 2023. This upward trend reflects a strengthened capital base and reduced reliance on external debt, suggesting a more resilient financial structure.

The company's EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization) margin paints a similar story of transformation. By dividing EBITDA by the operating revenue, this ratio expresses the operating performance percentage of its revenue. Initially at 0% in both 2019 and 2020, the margin increased significantly in 2021 and peaked at 48% in 2022. Though it fell slightly to 39% in 2023, this still represents a major shift in operational profitability. A comparable trend is seen in Return on Equity (ROE)- a profitability indicator that compares the net income to the total shareholders' funds. After negative results in 2019 and 2020 (–33% and –35%, respectively), the company managed to turn around its performance, reaching 24% in 2022. The decline to 19% in 2023 may signal increased operational costs -potentially linked to human resources expansion, office acquisition, inflation, or market competition- yet it remains a strong figure for a young firm.

Together, these indicators offer a dynamic picture of Numya's growth and maturity. The financial data reflects not only the company's internal adjustments but also its response to external volatility, suggesting a steady path toward financial robustness and operational efficiency.

2.3. Sector and Peer Analysis

To fully assess Numya's strategic positioning, it is important to understand the sectoral environment in which it operates. The broader context not only influences the company's performance but also shapes the opportunities it seeks to explore - particularly in the design of new services/products such as the Financial Flash Report.

The Portuguese business services sector, in which Numya is integrated, has undergone significant fluctuations in recent years, particularly due to the economic effects of the COVID-19 pandemic. To frame Numya within this landscape, a sectoral analysis was conducted using data from Banco de Portugal, filtered through the 3rd Portuguese Classification of Economic Activity (PCEA), under code 77400 – Leasing of intellectual property and similar products, except copyrighted works. For consistency and accuracy, the dataset

(available here: https://www.bportugal.pt/QS/qsweb/Dashboards) was limited to micro-entities, in line with Numya's current operational scale.

As shown in Figure 3, the current ratio across the sector started at 2.36 in 2019 and dropped to 1.44 in 2020, reflecting the immediate strain on liquidity caused by the pandemic. From 2021 onward, a stabilization phase followed, with the ratio remaining between 1.09 and 1.17 -suggesting cautious but steady recovery among smaller firms.

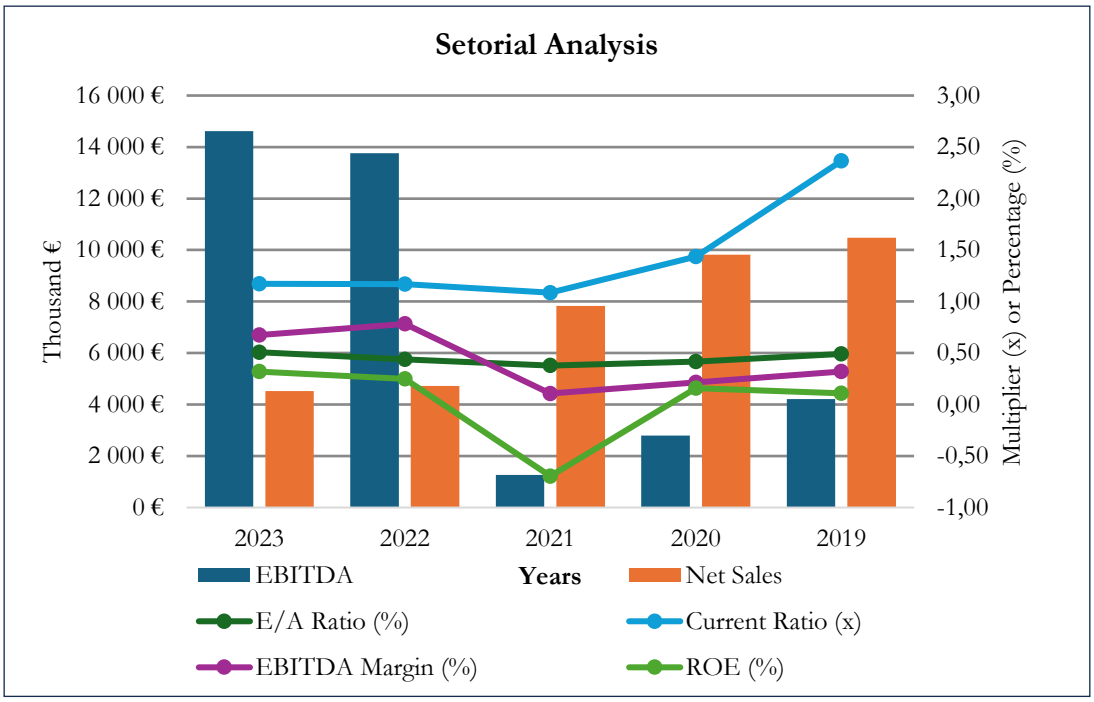

***Figure 3**- Sectorial Analysis*
Data Source: Quadro de Setores BdP

In terms of profitability, the EBITDA margin across the sector experienced notable shifts: from an initial 32% in 2019, it declined to 21% in 2021, before rebounding to 78% in 2022. A slight decline to 67% in 2023 indicates some consolidation, but overall, the sector proved capable of recovering and expanding its profit-generating capacity.

The ROE trajectory is equally illustrative. Following a significant dip to –70% in the aftermath of the pandemic, it recovered to a positive 32% by 2023. Meanwhile, the equity-to-asset ratio remained remarkably stable -hovering around 49% to 51%- suggesting consistent financing practices and balance sheet structure.

Despite this resilience, the sector has faced a gradual decline in net sales, from €10 million in 2019 to €4.5 million in 2023. This downward trend may indicate increasing market concentration or a more selective demand for specialized services.

Yet it is precisely within this context of stability amid structural change that Numya identified an opportunity to innovate. While partially mirroring the sector's recovery, it demonstrated more substantial progress in its financial structure and profitability. As the sector was consolidating and adapting, Numya made a strategic decision to invest in service differentiation -one that would eventually lead to the development of the FFR. More than a new reporting tool, the FFR was envisioned as a value-adding instrument capable of strengthening client relationships and expanding the firm's consulting and auditing activities.

To evaluate the strategic position of Numya in relation to its closest peers, a comparative analysis was conducted using Orbis and Sabi data, filtered to include only Portuguese micro-entities. Three companies with similar operational scopes and revenue levels were selected: Solily Unipessoal, Lda., Joana Bayan Investments, Lda., and Grupo Brandis, Lda. See Figure 4, below.

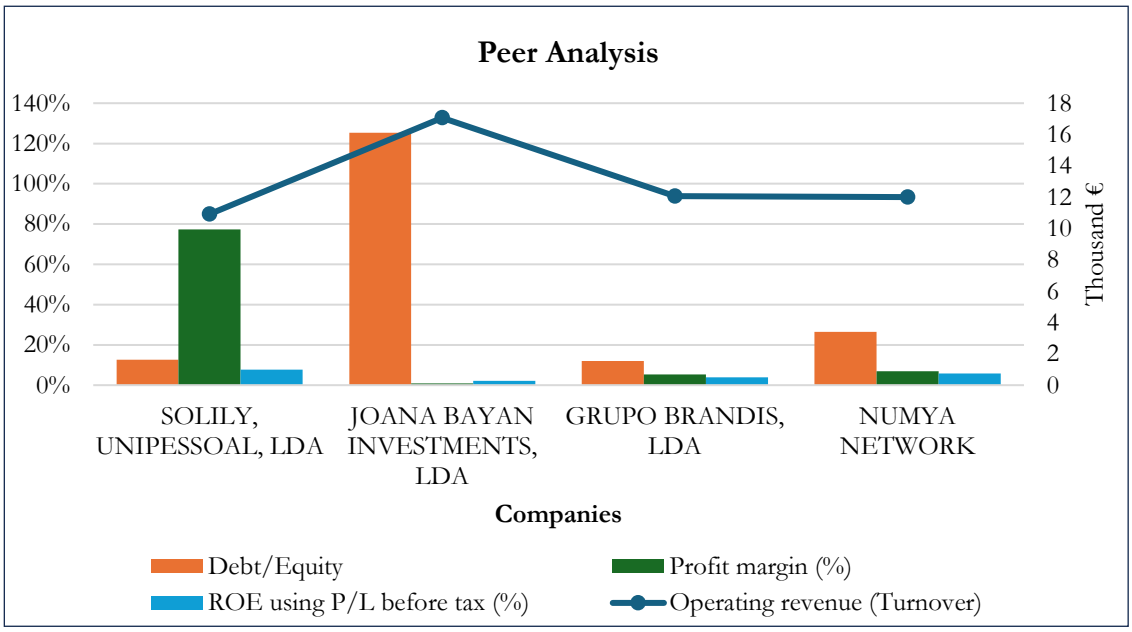

Figure 4 *Peer Analysis*
Data Source: Orbis & Sabi

In 2023, Joana Bayan recorded the highest operating revenue (€17k), followed by Grupo Brandis, with Numya closely behind at €12k. However, Joana Bayan's financial stability is weakened by a 125% debt-to-equity ratio- a financial indicator that compares liabilities to equity- and a 0% profit margin, signaling potential solvency concerns. By contrast, Numya presents a more balanced financial profile. It reports the second highest profit margin (6.9%), just behind Solily Unipessoal's exceptional 77.3%. In terms of ROE (measured by profit before tax), Solily leads with 7.6%, while Numya follows closely with 6%, outperforming

both Joana Bayan (2.1%) and Grupo Brandis (3.9%).

While these figures must be interpreted in light of each firm's maturity -Solily Unipessoal, for example, has over a decade of activity- Numya's performance reflects the solid foundation it has built in just five years.

Numya presents good performance indicators compared to its peers -some of them with higher maturity levels- positioning itself at a competitive level, combining credible and balanced profitable and financial values. It is from this stable and upward-trending base that the firm aims to leverage innovation, with the FFR emerging as a core component of that strategic ambition.

3. Internship Activities

The internship developed at Numya was structured around a sequence of interrelated activities that culminated in the design and implementation of a Financial Flash Report dashboard. This process not only required technical proficiency but also a critical understanding of how financial and accounting data can be transformed into decision-support tools. Table 1 summarizes the main activities and their contribution to the internship's overarching goal.

Activities/Phases	Output
(1) Standard Audit File for Taxes (SAFT-T PT) *See section 3.1.1for details*	Delivered insights into the structure of SAF-T files, facilitating an understanding of data organization and presentation.
(2) Data Processing *See section 3.1.2. for details*	Provided insight into how financial and statistical data is structured and classified.
(3) Figma (prototype) *See section 3.2. for details*	Designed a functional prototype to inform the Power BI implementation.
(4) Final FFR Development *See section 3.3. for details*	Delivered a tailored dashboard with management needs.

***Table 1**- Activities and their relation to the internship target goal*

The following subsections provide a detailed walkthrough of each activity (i.e., phase), highlighting both the methodological approach and the rationale underpinning the decisions taken throughout the internship.

3.1. Data Acquisition and Structuring

3.1.1. Working with SAF-T (PT)

The initial phase of the internship involved an in-depth exploration of the structure of the Standard Audit File for Tax Purposes (SAF-T), specifically the Portuguese version, which is a standardized XML (Extensible markup language) file designed to export accounting and invoicing data. This structure includes key components such as the customer, supplier, product, and taxonomy references, the general ledger accounts, general ledger entries, sales invoices, payments, movement of goods, and various documents -ensuring a comprehensive and organized dataset for tax reporting (see Table 2). Established by Portaria no 321-A/2007, this file plays a critical role in ensuring tax compliance and enabling effective inspections by the Portuguese Tax Authority.

While technically robust, the SAF-T system revealed practical inconsistencies in the control and classification of accounting information. In response, new taxonomies were introduced to align SAF-T with the Portuguese Accounting Standardization System (SNC -

sistema de normalização contabilística), as established by Portaria No 302/2016. These updates aim to ensure greater consistency between accounting and fiscal data, ultimately enhancing the reliability of SAF-T as a data source.

Although initially set to become mandatory for all companies by 2024, the implementation deadline was postponed to 2027, as stipulated in the 2025 State Budget proposal (Orçamento do Estado para 2025). This development further highlights the relevance of tools like the FFR, which can help businesses anticipate compliance challenges and improve financial transparency.

Índice do campo	Obrigatório.	Nome do campo	Notas técnicas	Formato (validável no xsd)
2.1.1.	*	Referencial de classificação de contas (TaxonomyReference)	Deve ser indicado o referencial de classificação de contas utilizado pela entidade (código de contas): "S" – SNC base – Taxonomia S "N" – Normas Internacionais de Contabilidade – Taxonomia S; "M" – SNC microentidades – Taxonomia M; "O" – Outros referenciais contabilísticos, cuja taxonomia não se encontra codificada.	Texto 1
2.1.2.	*	Registo na tabela de contas (Account)		N/A
2.1.2.1.	*	Código da conta (AccountID)	Devem constar do ficheiro todas as contas, incluindo as respetivas contas integradoras, até às contas do Razão.	Texto 30
2.1.2.2.	*	Descrição da conta (AccountDescription)		Texto 100
2.1.2.3.	*	Saldo de abertura a débito da conta do plano de contas (OpeningDebitBalance)	O saldo de abertura a débito será sempre o do início do período de tributação.	Monetário
2.1.2.4.	*	Saldo de abertura a crédito da conta do plano de contas (OpeningCreditBalance)	O saldo de abertura a crédito será sempre o do início do período de tributação.	Monetário
2.1.2.5.	*	Saldo de encerramento a débito da conta do plano de contas (ClosingDebitBalance)	O saldo de encerramento a débito será o do fim do período de tributação ou da data de geração, se anterior.	Monetário
2.1.2.6.	*	Saldo de encerramento a crédito da conta do plano de contas (ClosingCreditBalance)	O saldo de encerramento a crédito será o do fim do período de tributação ou da data de geração, se anterior.	Monetário

***Table 2**- Extraction from SAF-T(PT) Table Structure*
Source Data: Portaria no 302/2016, (2016)

3.1.2. Understanding Institutional Data Processing

Building on the SAF-T groundwork, the second activity focused on understanding how institutional data is collected, aggregated, and processed -particularly by the Banco de Portugal. This required familiarization with the (*Informação Empresarial Simplificada*-IES) system, which consolidates various accounting, fiscal, and statistical disclosures into a single, as established by Decreto-Lei No 8/2007.

In this phase, the analysis centered on how BdP integrates IES data and quarterly business surveys into a centralized database to construct sectoral analyses. As illustrated in Figure 5, this database supports the generation of sector-level statistics, refined according to company size and PCEA. This process demonstrated how granular data is transformed into statistically meaningful insights, which directly informed the design logic behind the FFR-particularly its benchmarking features.

This phase also deepened the understanding of how regulatory bodies interpret firm-level data and how they structure sectoral insights -knowledge that is critical for designing dashboards aligned with real-world standards and institutional expectations.

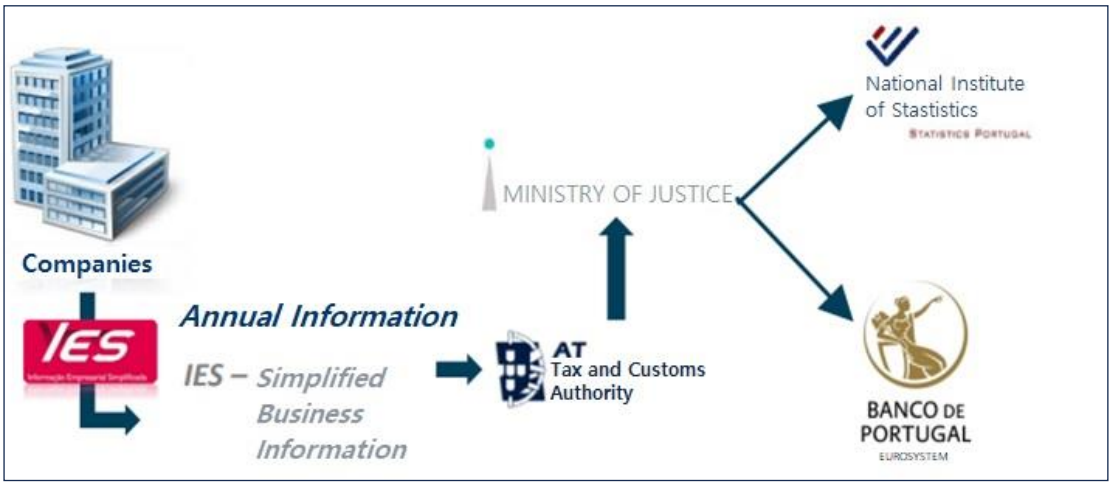

Figure 5 *- Illustration of how IES is shared for the 4 entities*
Source: Banco de Portugal, (2024)

3.2. From Concept to Design: FFR Prototype

Following the collection and processing of relevant data, attention shifted to designing a functional and relevant reporting tool. This began with an extensive review of academic and professional sources -including financial reports, sector studies, and Harvard case studies- to define the most relevant Key Performance Indicators (KPIs).

To systematize this information, an Excel database was developed, compiling a wide range of financial ratios across categories such as profitability, liquidity, efficiency, capital

structure/leverage, solvency, market and economic performance, and risk and return.

The indicators were then critically assessed and filtered to ensure relevance and robustness, forming the core analytical engine of the FFR. Particular emphasis was placed on adapting the dashboard to different sectors -namely industrial, services, and retail- ensuring that the solution would address sector-specific financial assessment needs.

This analytical phase culminated in the creation of a fully structured prototype using Figma, a vector-based design tool. The prototype served as both a design model and communication interface, laying out the visual logic, ad hoc numerical information and interactive elements of the future Power BI dashboard.

Figma enabled the simulation of user flows, navigation structures, and the visual hierarchy of information, ensuring coherence between technical functionality and user experience.

To explain the integrity of the prototype, each page is described as it was designed for. Firstly, the "Home" page serves as an introductory interface, providing access to credentials that allow users to identify and understand the roles of both editors and viewers. See Figure 6 below.

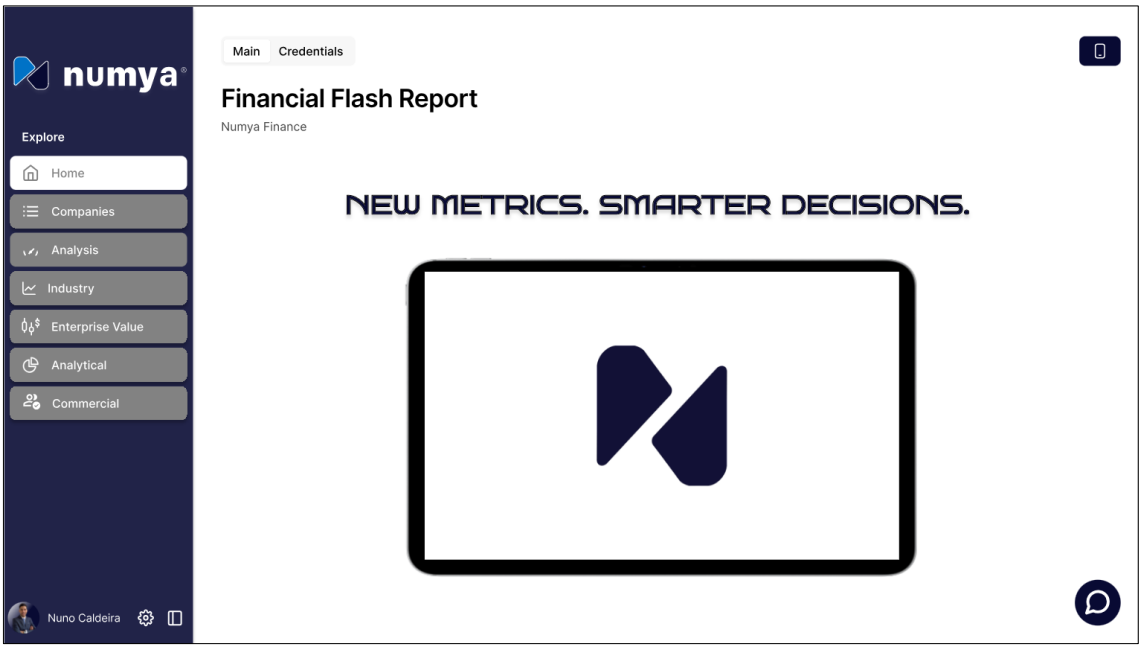

Figure 6 *- Figma's FFR "Home" page*

Next, the page "Companies" allows users to select any company utilizing this dashboard model for analysis. It also provides a brief status overview of the selected company. See Figure 7 below.

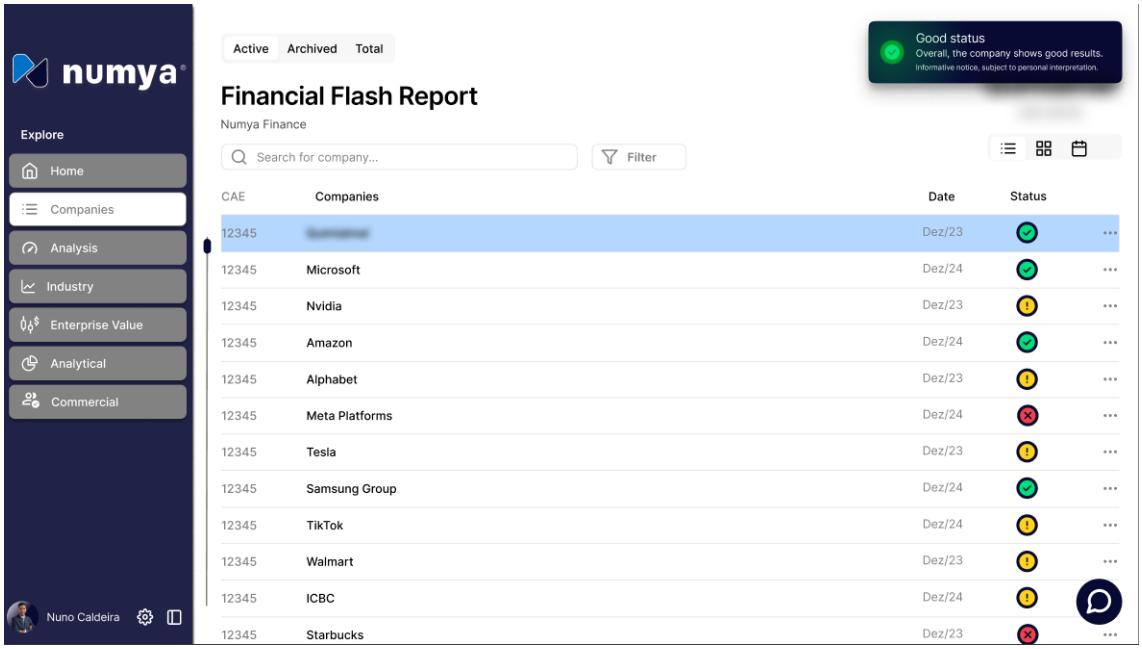

Figure 7 *- Figma's FFR "Companies "page*

Figure 8 presents the "Analysis" page, where financial and accounting data extracted from SAF-T files is processed into key indicators of profitability, liquidity, operational performance, and risk. This section is complemented by a Balance Sheet and Income Statement structured according to IFRS guidelines.

Figure 8 *- Figma's FFR "Analysis" page*

The following page, "Industry", was designed to benchmark the selected company against sectoral data sourced from BdP and its peer group. It provides users with insights

into market trends, enabling effective comparisons between the company's performance and the industry. See Figure 9 below.

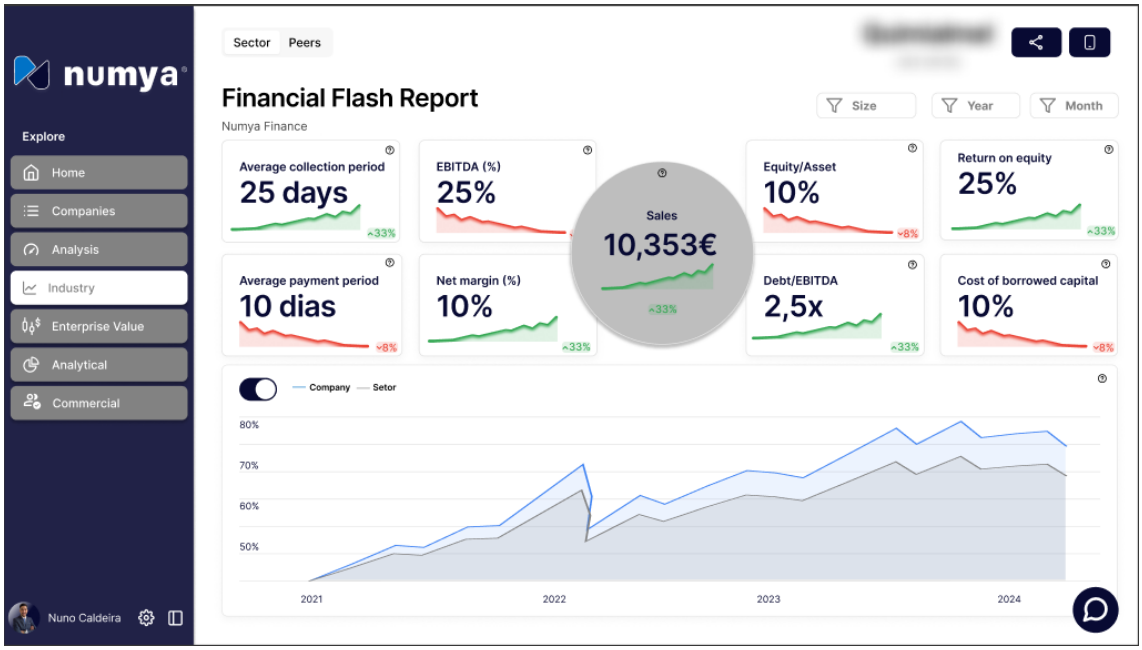

Figure 9 *- Figma's FFR "Industry" page*

The "Enterprise value" page offers an interactive and intuitive presentation of the firm's value and corresponding equity. It enables users to input estimated values that cannot be precisely derived from SAF-T files, facilitating a more comprehensive evaluation process. See Figure 10 below.

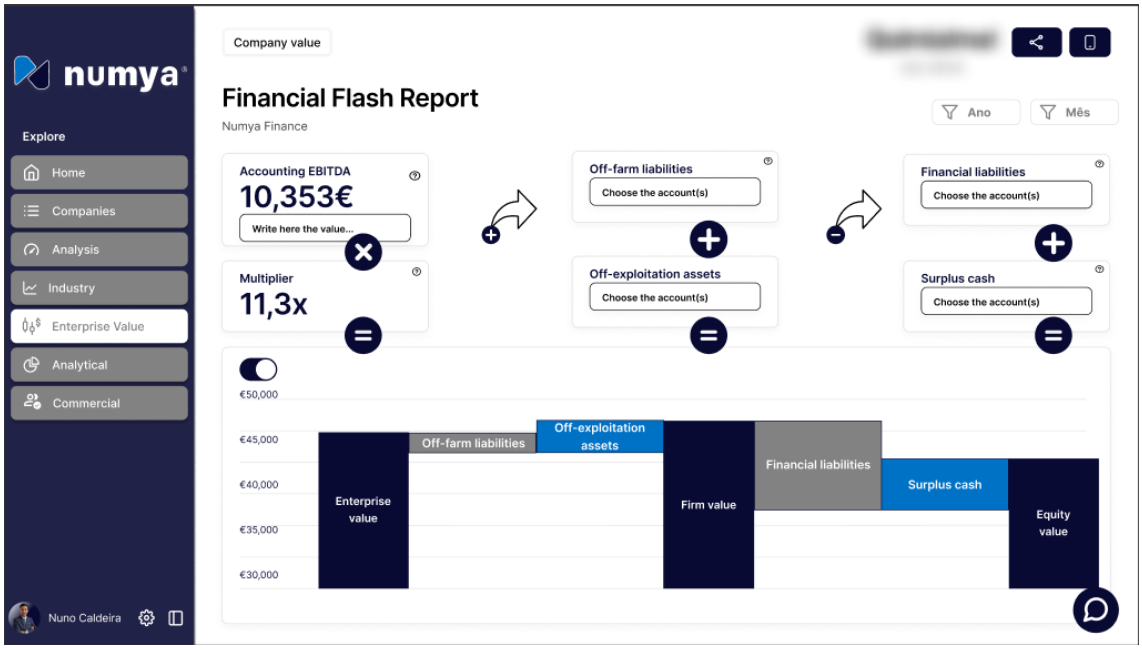

Figure 10 *- Figma's FFR "Enterprise Value" page*

Figure 11, the "Analytical" page, which presents a selection of accounting indicators

deemed relevant for different sectors -industry, services, and retail. These are aligned with PCEA classifications and offer a contextual overview of the company's performance within its corresponding sector.

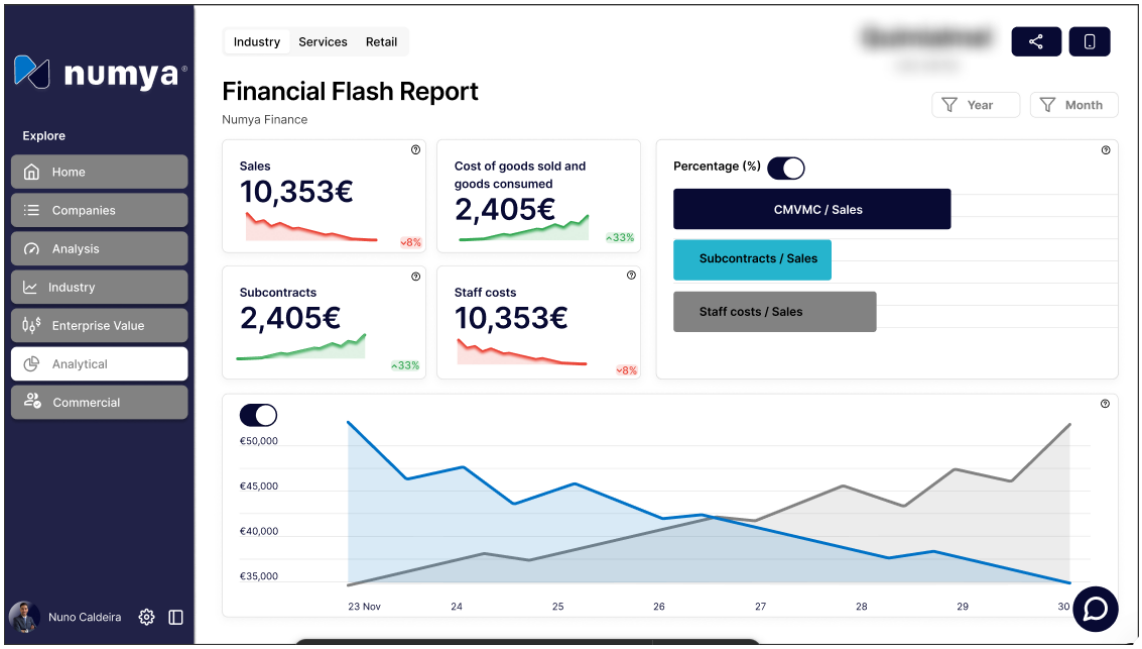

Figure 11 *- Figma's FFR "Analytical" page*

Lastly, the "Commercial" page focuses on indicators related to suppliers, clients, products, and other commercial aspects. It includes information on top suppliers and clients, highlights the most and least profitable countries for the company, and provides metrics such as the retention ratio, among others. See Figure 12 below.

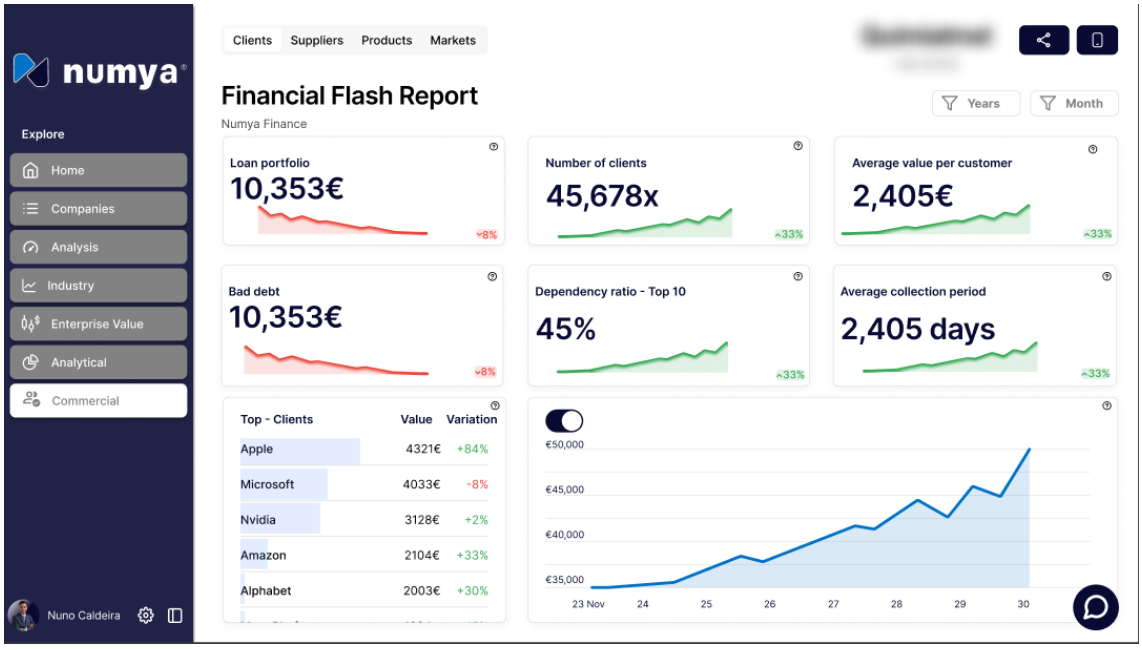

Figure 12 *- Figma's FFR "Commercial" page*

3.3. Strategic Deliverable: Finalizing the FFR

The final stage of the internship involved the implementation of the Financial Flash Report in Power BI, using all the previously structured information as its foundation. As illustrated in the following figures, the result was a dynamic and interactive dashboard capable of integrating SAF-T data and presenting real-time KPIs.

More than a technical exercise, the FFR represents a strategic initiative by Numya to expand its service offering. Positioned as a value-added product, the FFR is designed not only to enhance internal decision-making capabilities but also to be offered as a consultancy product to clients- thus reinforcing the firm's position in financial advisory and audit. In this way, my contribution extended beyond technical execution: the internship became an opportunity to co-develop an innovative tool that aligns with Numya's long-term business model. The project reflects the competencies applied and the firm's strategic foresight in leveraging financial data for competitive advantage.

Due to the ambitious scope of the designed prototype -which exceeded what could realistically be developed within the available timeframe- only the "Home" and "Analysis" pages were fully implemented. As the "Home" page does not rely on data processing, the most critical component, the "Analysis" page will be discussed below. This page was successfully implemented and provides the company with clear, accurate insights into its performance.

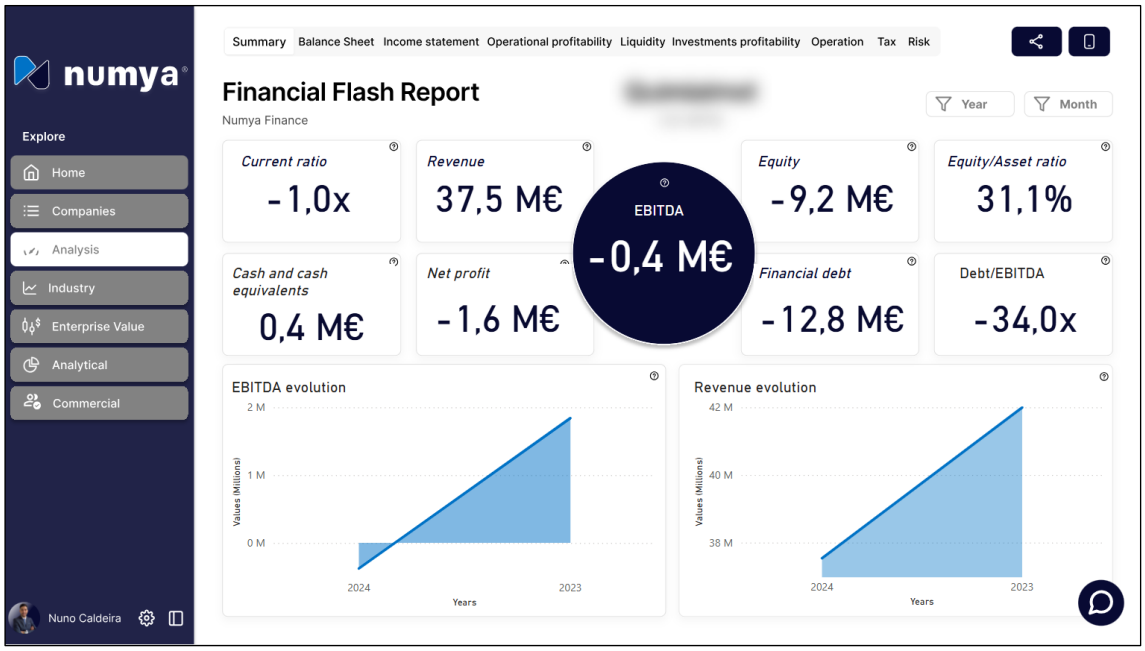

Figure 13 - *FFR's "Summary" sub-page*

As Figure 13 illustrates (above), minor differences can be observed between the "Summary" sub-page in the prototype and the final version, particularly in the graphical representations. These differences primarily stem from the use of data from only two consecutive years (2023 and 2024), a constraint imposed by the size and complexity of the SAF-T files, which significantly affected Power BI's data loading capacity.

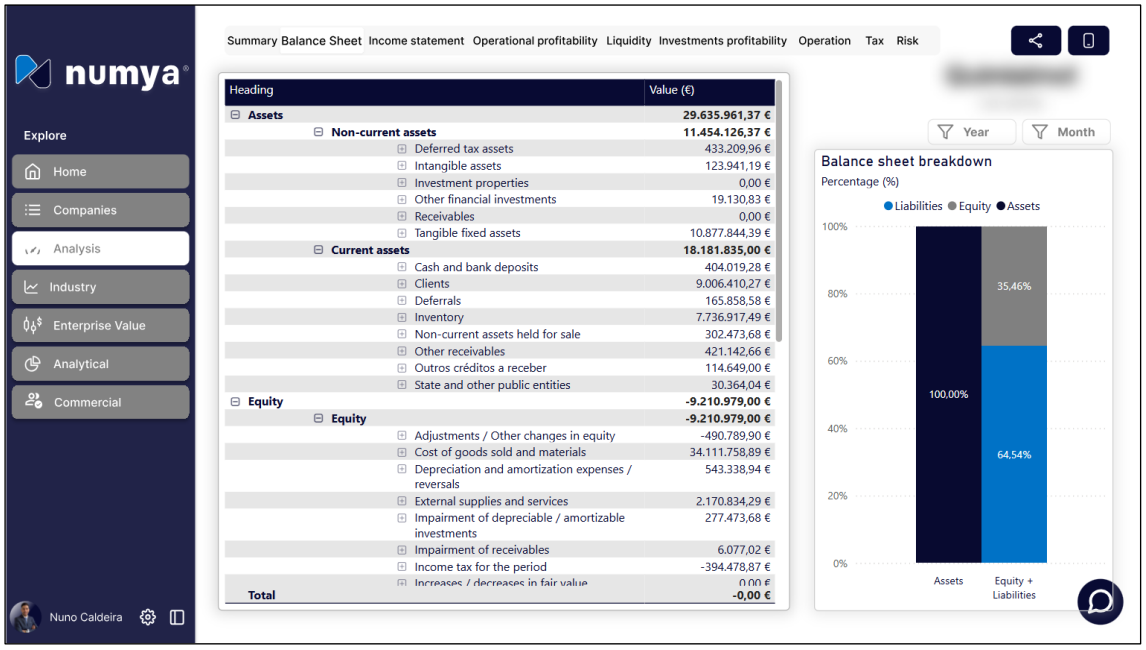

Figure 14 - *FFR's "Balance sheet" sub-page*

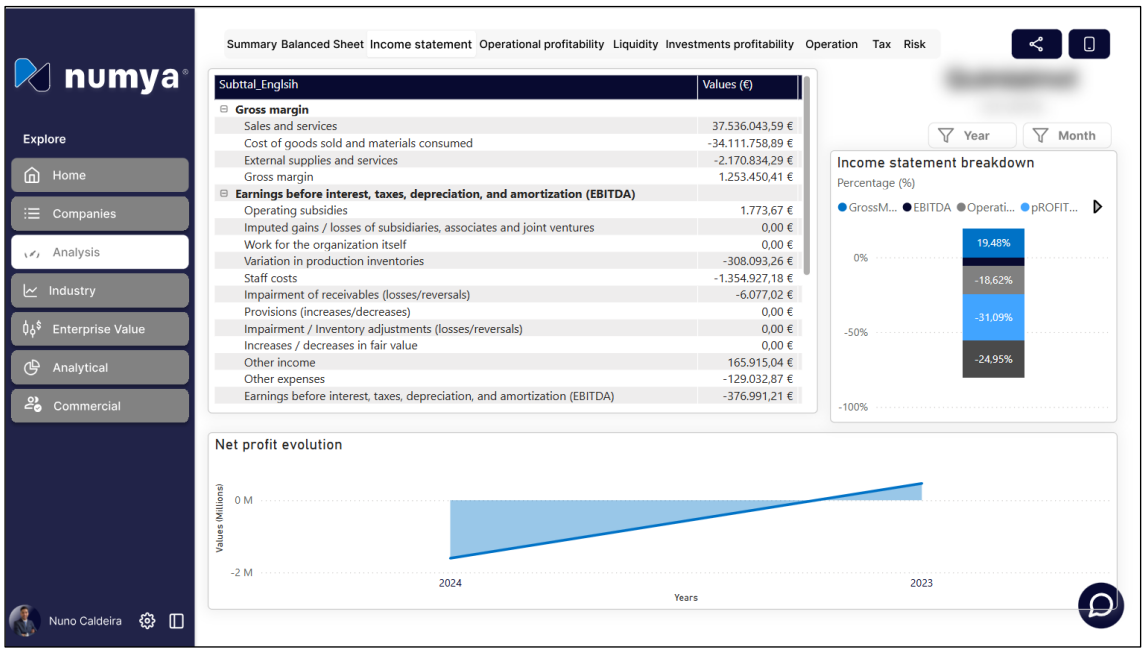

Figure 15 - *FFR's "Income statement" sub-page*

The following two sub-pages present a structured Balance Sheet and Income Statement, aligned with IFRS guidelines. These are supplemented by detailed breakdowns that compare figures across the two years, and facilitating a clearer understanding of the relative weight of each financial variable. See Figure 14 and Figure 15 above.

The following sub-page (Figure 16) focuses on operational profitability, featuring key performance indicators such as EBITDA, EBIT (Earnings Before Interest and Taxes), EBT (Earnings Before Taxes), and Net Margin, all benchmarked against total sales. Each indicator is accompanied by dynamic visualizations that enable temporal analysis.

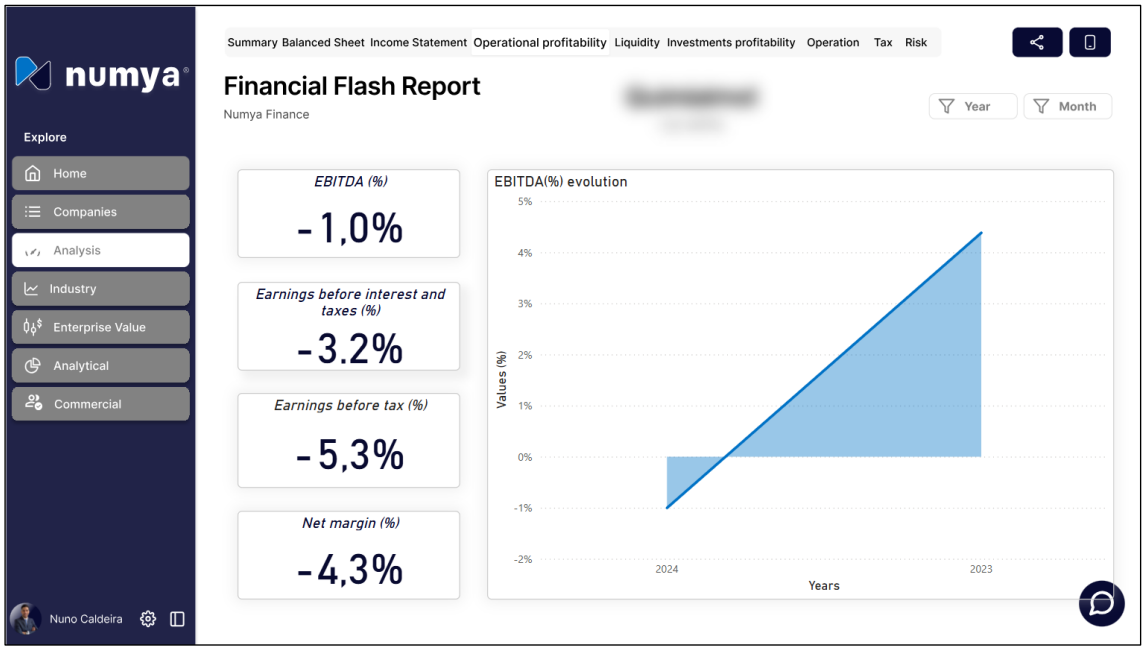

Figure 16 *- FFR's "Operational profitability" sub-page*

The "Liquidity" sub-page (Figure 17) displays liquidity ratios, including cash and cash equivalents, net debt, current ratio, and Net Debt/EBITDA. These metrics provide insight into the company's capacity to meet its short-term obligations.

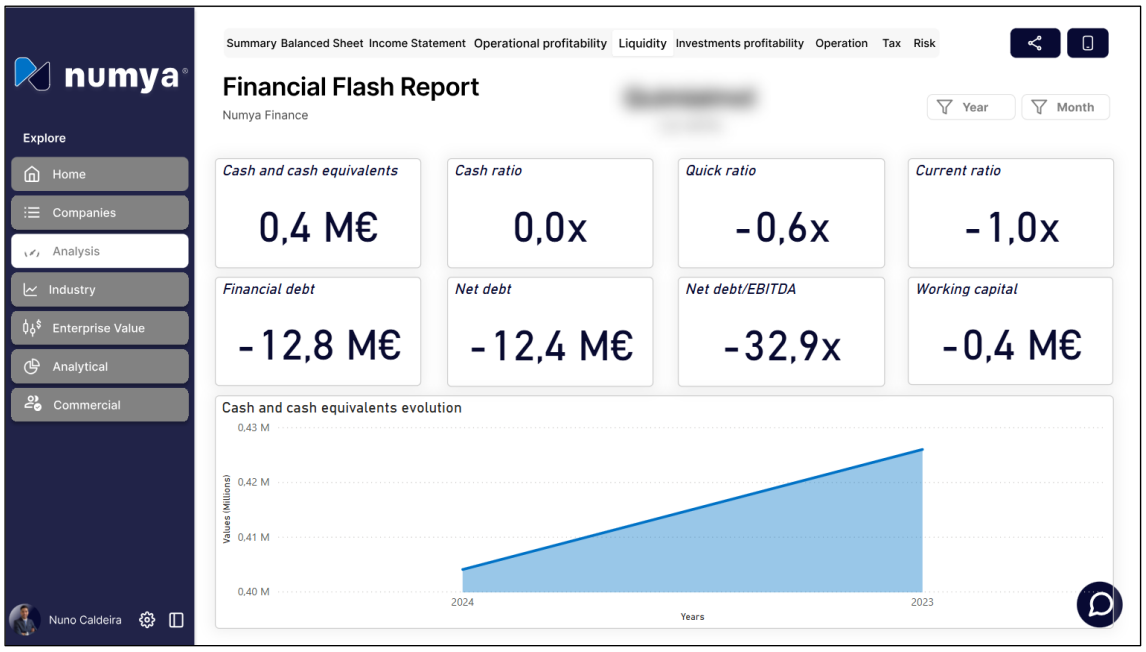

Figure 17 *- FFR's "Liquidity" sub-page*

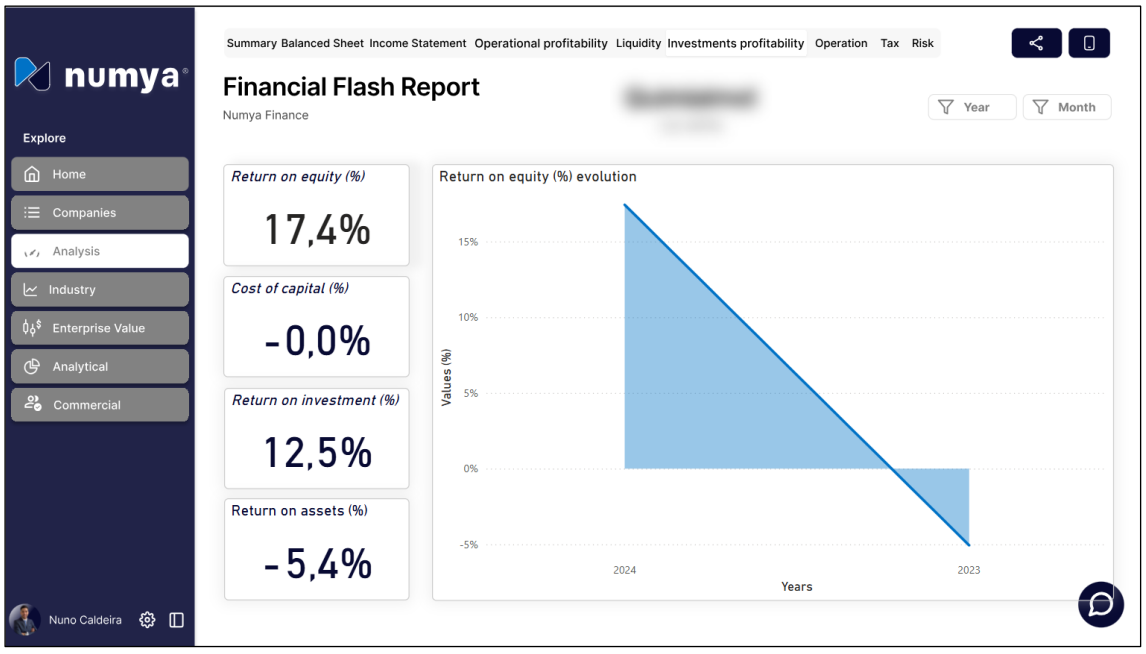

Figure 18 *- FFR's "Investment profitability" sub-page*

Figure 18 presents the "Investment Profitability" sub-page, which offers insight into the returns generated by the company's investments. It includes key indicators such as ROE, Return on Assets (ROA), Return on Investment (ROI), and Cost of Capital -essential metrics for evaluating investment efficiency.

The "Operations" sub-page focuses on operational efficiency through indicators such as Days Payable Outstanding (DPO), Days Sales Outstanding (DSO), Inventory Turnover, and the Cash Conversion Cycle (CCC), which measures the time required for an

investment to generate profit. This section is supported by two graphs: one on the right side offering a macro-level overview of all variables over time, and another on the left side highlighting the temporal evolution of each variable individually. See Figure 19 below.

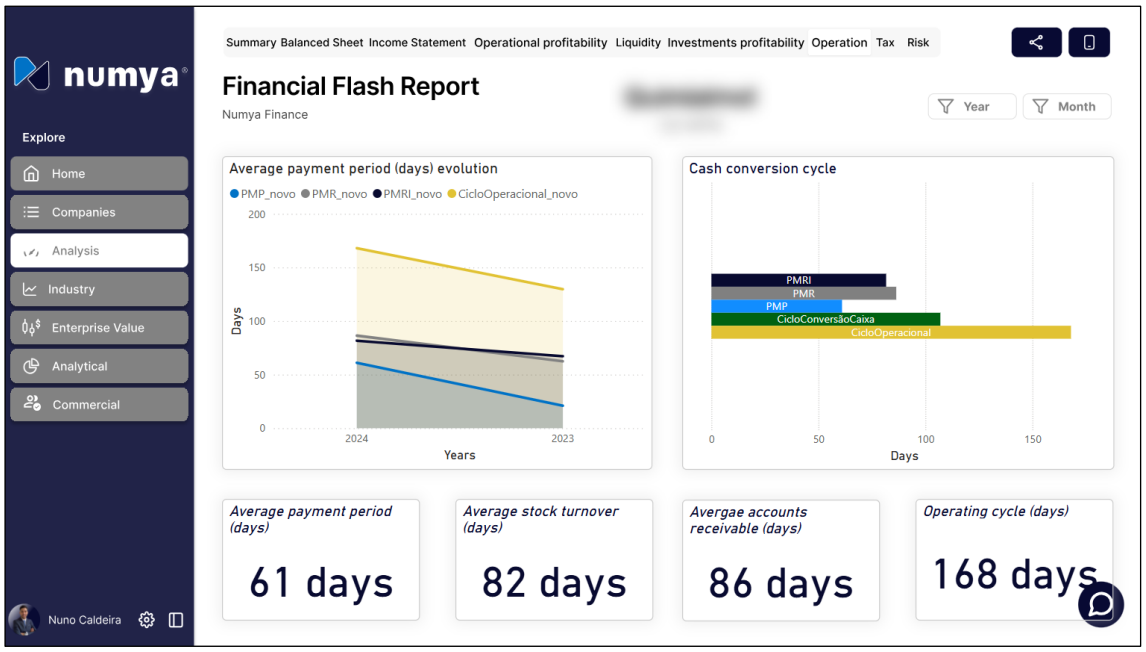

Figure 19 *- FFR's "Operation" sub-page*

The following sub-page, "Tax", outlines key tax-related metrics, including value added tax balance, deductibility, tax liquidity, corporate income tax expenditure, and social security contributions. These are supported by a dedicated graph to facilitate temporal analysis. See Figure 20 below.

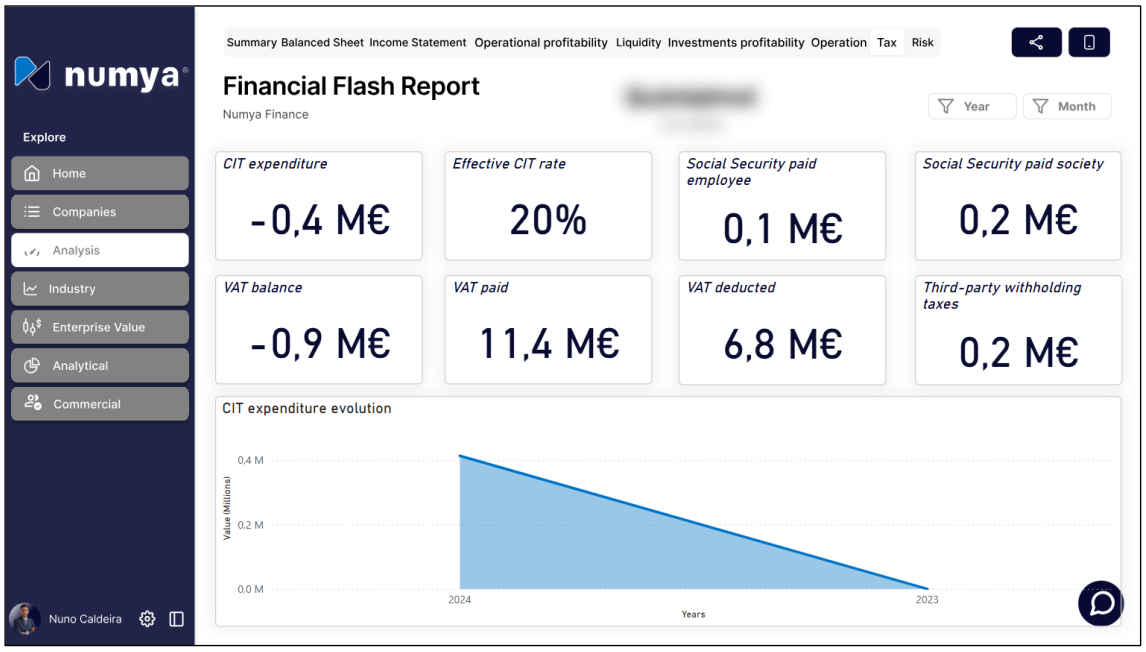

Figure 20 *- FFR's "Tax" sub-page*

Lastly, the "Risk" sub-page evaluates the company's exposure to financial risk and overall solvency. Indicators such as the Equity-to-Asset ratio, Working Capital, and Net Debt/EBITDA are used to evaluate the firm's capacity to finance its operations independently and to determine its level of financial leverage. See Figure 21 below.

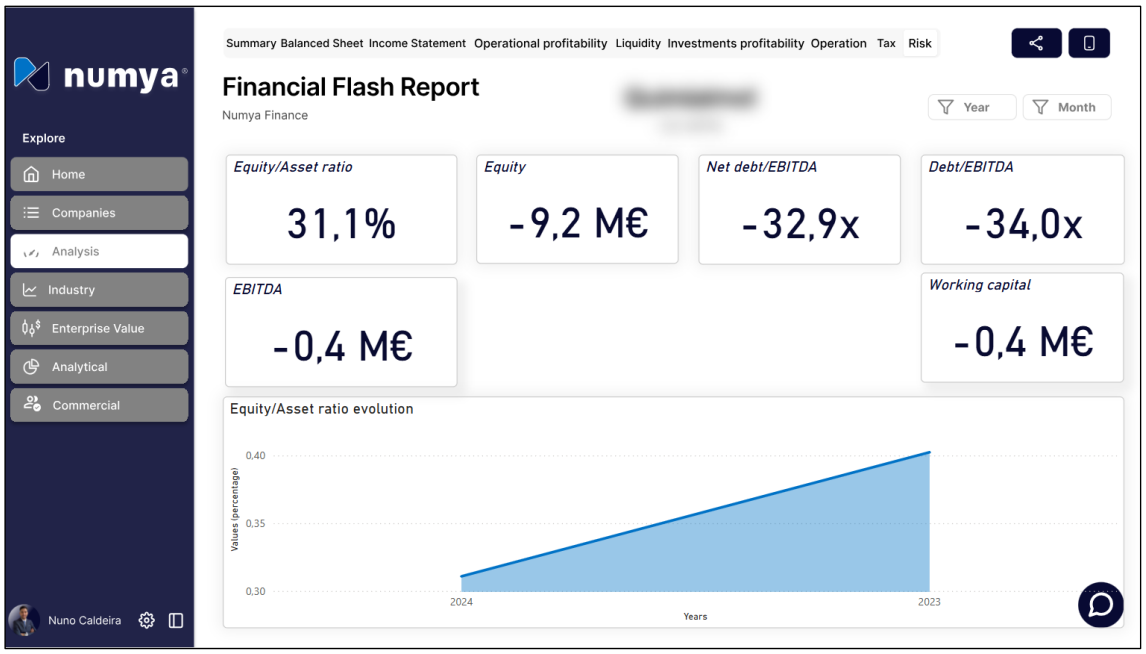

Figure 21 *- FFR's "Risk" sub-page*

Overall, the FFR developed provides a clear and accessible method for applying insights to other datasets, while enhancing the readability of a company's accounting and financial performance. It highlights the most important indicators and metrics that can be used to analyze a company, serving as a foundation for future research -ranging from basic assessments to more comprehensive and innovative evaluations that are not readily available in the market.

These insights can support consultancy services in responding more effectively to client needs, enhancing the quality of decision-making.

4. Literature Review

As mentioned in Section 3.2, the development of a Financial Flash Report as the central output of this internship project is grounded in multiple conceptual foundations. This literature review explores four key areas that helped shape the development of a reporting tool: financial reporting frameworks, real-time reporting through Financial Flash Reports, performance measurement using Balanced Scorecards (BSC), and data visualization through dashboards powered by business intelligence (BI) systems. Together, these perspectives offer a solid foundation for understanding both the rationale and the technical approach behind the solution created at Numya.

4.1. Financial Reporting Fundamentals

In a fast-changing and information-driven economy, organizations are under increasing pressure to track their performance and communicate their financial health with transparency and reliability (Abdalla et al., 2021; Fikri et al., 2019; Vera-Baquero et al., 2016). Within this context, financial reports remain central tools in capturing and communicating business performance and operational efficiency (Bushman et al., 2001; Graham et al., 2005).

Financial reporting plays a dual role: it functions both as an informational mechanism and as a strategic communication tool, allowing stakeholders -i.e., investors, creditors, regulators, and management -to assess profitability, financial resilience, and sustainability (Hunton et al., 2006; Pelger, 2016; Roychowdhury et al., 2019; Trombetta, 2022). Financial literacy-particularly the ability to interpret such reports- remains essential to effective decision-making (Tracy, 2009).

Beyond numerical outputs, financial reporting is governed by four essential principles: reliability, relevance, comparability, and clarity (Regulation (EC) No 1606/2002). These principles ensure the multidimensional integrity of financial analysis, going beyond isolated figures and enabling integrated evaluations (Casta & Ramond, 2016).

While financial reports traditionally include standard elements such as balance sheets, income statements, and cash flow statements, their structure and quality depend on the frameworks followed -particularly IFRS[1] and GAAP[2]. These international standards aim to

[1] IFRS (International Financial Reporting Standards) refers to a set of globally recognized accounting standards developed and issued by the International Accounting Standards Board (IASB). IFRS aims to ensure transparency, consistency, and comparability of financial statements across international boundaries. Also, it streamlines processes across organizations (Regulation (EC) No 1606/2002).

[2] GAAP (Generally Accepted Accounting Principles) refers to the standardized framework of accounting principles, standards, and procedures recognized by the U.S. Financial Accounting Standards Board (FASB)

harmonize financial communication, improve comparability, and reduce information asymmetries in capital markets (Barth & Landsman, 2010). The literature reflects a complex debate on the comparative effectiveness of IFRS and GAAP. Although IFRS, with its principles-based approach and emphasis on fair value, offers flexibility and global alignment – as stated by Barth (2014) and De George (2016)- concerns remain about auditor subjectivity, implementation costs, and regulatory harmonization (Ernst & Young, 2024). On the other hand, GAAP, with its rules-based structure and historical cost orientation, offers more prescriptive guidance but less adaptability.

These complexities highlight a challenge for companies, particularly SMEs, navigating between compliance requirements and the need for decision-support tools. It is precisely within this tension that the opportunity for dynamic and user-driven reports, such as the FFR, emerges.

4.2. Dashboards as Decision-Support Tools

With the foundation of financial reporting information established, and to enhance FR analysis and visual data presentation, technological tools help to transform data into actionable insights. Among the various BI instruments, dashboards stand out as one of the most practical and widely adopted tools for real-time reporting. Their purpose is to visualize key indicators quickly and intuitively, allowing managers to grasp performance insights and act without delay (Dolan et al., 2013; Hjelle et al., 2024).

Dashboards are effective precisely because they consolidate complex information into a single, interactive, and user-friendly interface. As Eckerson (2011) argues, this visual production not only simplifies decision-making but also supports ongoing monitoring and communication within organizations. This is particularly true when dashboards are tailored to user-specific roles and information needs (Bose, 2009).

The customization of KPIs, and their presentation according to strategic relevance, is key to ensuring dashboards are not merely attractive interfaces, but effective management tools (Pauwels et al., 2009; Yigitbasioglu & Velcu, 2012). While there is still limited empirical research on the ideal structure and organization of dashboards, authors such as Tufte (2001) and Knaflic (2015), emphasize the importance of designing visualizations that are both clear and decisive.

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and the Governmental Accounting Standards Board (GASB) and is commonly applied by U.S.-listed companies (US Securities and Exchange Commission, 2011).

The literature offers some useful principles to guide effective dashboard design. First, users should be able to focus on the meaning of the data without being distracted by how it's presented. Visual elements should support comparison across different overviews, allowing users to move easily from a general to more detailed metric -while also avoiding out-of-context numbers that could lead to misinterpretation. Overly dense or complex content should be avoided, as it can undermine understanding rather than enhance it.

Finally, throughout development, dashboards should be critically evaluated -not only for data accuracy but also in terms of design, clarity, interactivity, and relevance. Simplicity, visual cleanliness, and alignment with the needs of the target audience are crucial. The goal is to reduce cognitive effort, highlight what matters most, and make the data genuinely actionable.

The dashboard developed at Numya was built with these design principles, ensuring that every visual element supported performance analysis without overwhelming the user. Its development was guided by a dual focus on clarity and actionability, in line with best practices in business intelligence and visual reporting (Hjelle et al., 2024; Sharda et al., 2015). That said, BI tools do not operate in isolation- their effectiveness also relies on the thoughtful selection of performance measures that align with the strategic goals of each company.

4.3. Balanced Scorecards for Strategic Performance

To ensure that financial insights lead to strategic alignment, reporting tools must look beyond just historical data (Tawse & Tabesh, 2023). This is where the Balanced Scorecard, introduced by Kaplan & Norton (1996), offers a valuable framework. By combining financial and non-financial indicators, the BSC provides a more holistic view of organizational performance.

The BSC helps companies align short-term results with long-term strategic goals, considering dimensions such as internal processes, customer satisfaction, and learning and development. While financial metrics remain essential, long-term success increasingly depends on intangible assets like innovation and human capital (Kaplan & Norton, 1992).

At the heart of this approach lies the careful selection of key performance indicators. Research consistently shows that the choice of KPIs should reflect the specific objectives of each organization (PricewaterhouseCoopers, 2007). These indicators must have a balance between lagging metrics (e.g., past revenue) and leading ones (e.g., employee efficiency), as noted by Parmenter (2015), to capture both outcomes and drivers of performance.

However, the literature also warns against including too many or poorly chosen indicators in dashboards. In support of this, PricewaterhouseCoopers (2007) recommends displaying no more than four to ten KPIs to ensure clarity and focus.

To understand the importance of these indicators within BI tools, it is useful to look at the ones most commonly used. According to Stobierski (2020) and Deloitte (2023), the most valuable KPIs typically include liquidity ratios (e.g., current and quick ratios), profitability ratios (e.g., return on equity, return on investment, and return on assets), solvency ratios (e.g., debt-to-equity), and efficiency ratios (e.g., asset turnover). However, Elzahar et al. (2015) point out that there is no solid empirical evidence that these KPIs alone improve decision-making quality.

Successful implementation depends on selecting relevant KPIs that are clear, customized, and aligned with the organization's context (Kaplan & Norton, 1996). These principles were central to shaping the KPI architecture of the FFR developed during this internship, which sought to address the limitations of traditional financial reporting.

4.4. Financial Flash Reports (FFRs) as Strategic Tools

While traditional financial reporting ensures transparency and comparability, it is often constrained by reporting time lags that limit an organization's ability to respond quickly in a changing business environment. In response, real-time reporting has gained importance, offering insights at the speed required for modern, data-driven decision-making.

The FFR is a concise, high-impact reporting format that aggregates critical financial and operational metrics into a streamlined, accessible view (Bose, 2009; Vasarhelyi & Alles, 2008). Unlike quarterly or annual reports, FFRs eliminate delays in data processing and validation, enabling continuous monitoring and prompt strategic action (Trigo et al., 2014). Properly implemented, FFRs offer more than just agility. They improve organizational responsiveness, reinforce control, and can even become a competitive advantage, as noted by Deloitte (2019). Investors and management teams value the clarity, transparency, and speed of the insights provided, allowing for more informed and proactive business conduct (Longitude Research, 2013).

Although the availability of data doesn't guarantee effective decision-making, it can lead to compromising decision-making perspectives. As Taleb et al. (2021) note, decision quality depends not only on data quantity but also on its relevance and correct interpretation skills. Moreover, robust data processing combined with users' expertise plays a crucial role

for ensuring accurate insights that contribute to strategic decisions (Janssen et al., 2017). The author proceeds by explaining that as datasets expand, the human cognitive ability to interpret them is challenged, making data process and presentation essential. Furthermore, managers' knowledge and experience significantly increase decision quality, however, they can be manipulated by visually appealing dashboards.

As stated by Raghunathan (1999), understanding the context and meaning of analyzed data increases significantly the decision quality. These conclusions underscore the idea that data-driven decision-making relies on synergy among technological tools, data quality, and cognitive skills.

Technologically, FFRs rely on Business Intelligence systems, which consolidate raw data into structured information ready to support analytical and strategic processes (Ashraf et al., 2020; Suša Vugec et al., 2020; Yang et al., 2022). BI is a vital enabler of this real-time functionality, offering tools that collect, process, organize, analyze, and disseminate data to support timely decisions (Lönnqvist & Pirttimäki, 2006; Rouhani et al., 2016).

However, the complexity and cost of implementing BI ecosystems -including tools such as dashboards, Business process management (BPM), cloud platforms, and mobile interfaces -remains a barrier for many organizations (Belfo & Trigo, 2013; Trigo et al., 2014).

5. Critical Analysis

The internship was initiated with the ambitious goal of developing a sophisticated Financial Flash Report - a dashboard capable of processing SAF-T data into critical insights that facilitated decision-making for Numya's consultants and auditors. However, as the internship progressed, it became evident that the initial vision exceeded the three-month timeframe.

Although the idea was innovative, it underestimated the technical complexity of handling SAF-T files, the performance constraints of technological equipment, and the selected tools. Consequently, only some financial indicators – excluding those related to clients and suppliers, and sectoral benchmarks - were fully implemented. Temporal data was also limited to two consecutive years due to the large size of the SAF-T datasets. Additionally, another challenge arose from the SAF-T itself. Despite their standardized structure, when extracted to Excel, SAF-T files display various inconsistencies, including numerous null values, blank cells, and mismatched column numbers. Each obstacle was addressed through a proactive approach, using forums, online courses, and artificial intelligence tools, which enabled technical solutions resulting in data handling and dashboard production.

To develop the dashboard, consideration was given to the emphasis placed by Kaplan & Norton (1992, 1996) on non-financial metrics as key drivers of the company's long-term success. This topic became a central focus during meetings with company managers. However, as the SAF-T file contains only accounting data, it was not possible to include qualitative information such as human capital and innovation-related metrics. In theory, such metrics could be measured if Numya's clients provided internal analytical reports. However, this possibility was quickly dismissed, as Numya's clients – primarily SMEs – typically do not produce or maintain such internal monitoring systems.

Although the FFR did not reach the scope proposed by Kaplan and Norton due to limitations of the SAF-T file, the dashboards were nonetheless designed meticulously. Firstly, they provide an automated balance sheet and income statement, with layouts aligned with IFRS standards. In the balance sheet, assets are presented first, followed by equity, and then liabilities, with non-current items listed before current ones. In the income statement, the IFRS structure is followed, beginning with gross profit and proceeding through EBITDA, EBIT, and EBT, ending with the net profit for the period. This format ensures full transparency in the presentation of the accounting information.

Secondly, the design focused on presenting clear and concise information, ensuring

an organized view that avoids distracting the user. Temporal data was incorporated to allow comparisons over time. The use of professional color schemes and a thoughtful visual presentation was guided by the principles of Tufte (2001) and Knaflic (2015), who emphasize reducing cognitive effort and producing actionable data visualizations. Furthermore, in line with the recommendations of PricewaterhouseCoopers (2007), each dashboard was limited to a maximum of ten KPIs, with a minimum of four per page. The KPI selection process was carefully conducted to include only accurate and relevant performance indicators for each dashboard page -including liquidity, profitability, solvency, efficiency, tax, and risk ratios- as outlined by Stobierski (2020) and Deloitte (2023). This adherence to best practice ensured that the FFR delivered insights that were both meaningful and actionable for end-users.

To ensure the applicability of FFR, Power BI proved to be an essential tool -albeit not without limitations. While it provides an accessible platform to create dashboards, its performance declines when handling large datasets. Frequent slowdowns, system crashes, and instances of unsaved work adversely affect productivity. Moreover, Power BI lacks certain features necessary to meet the expected standards, particularly its inability to fully isolate datasets from end-user access. This limitation might compromise the confidentiality and security of sensitive information. As noted by Belfo & Trigo (2013) and Trigo et al. (2014), BI systems can be complex to implement, a challenge that became evident during the development of the FFR.

Furthermore, the insights from Taleb et al. (2021) and Janssen et al. (2017) were particularly impactful during the development of the FFR. The financial expertise and interpretative guidance provided by my internship supervisor were also crucial in enhancing the usability of the FFR from an end-user perspective.

Although the aim was to enable real-time data usage -which proved feasible- to make it automated, an Application Programming Interface (API) would be necessary. Implementing such an API would allow continuous extraction of SAF-T files from the company's accounting software without manual intervention. However, it requires technical knowledge in software programming, which exceeds my technical skills. Another feature of the FFR -initially considered the most innovative but became the least feasible- was the integration of a chatbot box feature. This feature aimed to integrate Power BI with artificial intelligence to assist users in understanding how ratios and KPIs were calculated, and to elucidate the "story behind the numbers".

Despite the limitations, the FFR confirmed key arguments presented by Ashraf et al. (2020), Suša Vugec et al. (2020), and Yang et al. (2022) regarding the role of FFRs in enhancing decision-making processes. Although no formal end-user validation was conducted, the FFR's ability to provide timely and structured financial information has the potential to significantly reduce the time and effort required by Numya's consultants or auditors when analyzing client data, thereby supporting faster and more informed decision-making. Adopting a cross-departmental approach, this internship demonstrated that a properly implemented FFR system can bring measurable improvements to consultancy efficiency and service delivery.

Overall, this internship provided valuable insights into the technical and practical challenges of implementing the FFR to support strategic decision-making in business and management contexts. This report also underscored important considerations for future developments, particularly usability, data security, and large-scale data analysis. Further research into the impact of this FFR implementation on Numya's performance and client satisfaction would be a welcome contribution.

6. Conclusion

This internship report describes the development of a Financial Flash Report at Numya, a company specializing in accounting, auditing, and consulting services. To enhance business strategy, decision-making, and management, the FFR was designed to provide timely and actionable information to Numya's consultants and auditors, thereby supporting the decision-making process.

Developing the FFR, prototyping it, and understanding the structure of SAF-T files were the core tasks of the internship. Each task was critical to achieving the expected result, as this organized way of work provided a clear view of the internship objective and allowed managers to predict the expected result.

The development of the FFR relied on Power BI, a tool that enabled the creation of dashboards integrating SAF-T data. Through data processing, the dashboards presented clear and precise accounting and financial KPIs, enabling timely and accurate information to support consultants' decision-making.

By presenting automated balance sheets and income statements, a professional color palette, temporal data display, and an organized view with a maximum of ten key indicators (and with a minimum of four) in interactive dashboards, the FFR reduces time and effort compared to the traditional step-by-step methods. Although end-user validation was not conducted, the shift from manual structuring of accounting and financial insights has the potential to accelerate advisory processes, allowing consultants to deliver strategic insights, simulate risk scenarios, and offer data-driven advisory with higher efficiency.

However, the development of the FFR presented some limitations related to SAF-T files and Power BI. Extracting SAF-T data to Excel was challenging due to inconsistent column numbers across files, large datasets, null values, and blank cells. Additionally, Power BI presented constraints, such as system shutdowns or crashes caused by the large size of SAF-T files. These obstacles were addressed proactively using online forums, courses, and artificial intelligence tools, which enabled technical solutions for data handling and dashboard production. Nevertheless, some features proved unfeasible due to Power BI limitations, including ensuring the confidentiality of data to the end-users, implementing an artificial intelligence (AI) chatbot, and the company's selection page, as Power BI doesn't support selecting different datasets within the same model.

Certain dashboard pages, such as "Industry", "Enterprise Value", "Analytical", and "Commercial", could not be implemented due to time constraints and SAF-T data

processing. Others, like the "Companies" page, were beyond my skills and Power BI's capabilities.

Despite these challenges, there is potential for future improvements. Numya could use the prototype as a foundation for an application that addresses the identified limitations. For instance, embedding Power BI into an app-building platform to enable dataset selection and incorporate an AI chatbot. Additionally, if fully produced, this reporting tool could enhance Numya's specialized services.

Furthermore, with these improvements, Numya could not only use FFR for internal service but also offer it as a product for clients who want to monitor their performance.

Beyond the technical implementation, this internship presented a key moment of professional growth. It highlighted the real-world impact that this FFR can have in the consultancy field and highlighted the role of Power BI integration and SAF-T data modeling in enhancing Numya's services.

While implementation challenges remain and public reports are limited, the FFR represents a strategic opportunity for companies like Numya seeking to differentiate through service innovation. Additionally, with the SAF-T submission expected to become mandatory for all companies in Portugal by 2026, the need to report to the Tax Authority may lead to increased research in this field and an improvement of such reporting models in the coming years.

Overall, this internship allowed me to consolidate technical and theoretical knowledge with a real-world challenge, leading to significant professional growth in consultancy. This experience reinforced my intent to pursue the advisory field, leveraging Business Intelligence to automate data analysis processes and develop solutions for financial reporting to support decision-making.

7. References

Abdalla, A. M., Carabias, J. M., & Patatoukas, P. N. (2021). The real-time macro content of corporate financial reports: A dynamic factor model approach. *Journal of Monetary Economics*, *118*, 260–280. https://doi.org/10.1016/j.jmoneco.2021.01.006

Ashraf, M., Michas, P. N., & Russomanno, D. (2020). The Impact of Audit Committee Information Technology Expertise on the Reliability and Timeliness of Financial Reporting. *Accounting Review*, *95*(5), 23–56. https://publications.aaahq.org/accounting-review/article-abstract/95/5/23/4217/The-Impact-of-Audit-Committee-Information?redirectedFrom=fulltext

Association of Chartered Certified Accountants. (n.d.). *The Language of Financial Reporting*. Retrieved March 6, 2025, from https://www.accaglobal.com/gb/en/student/sa/professional-skills/find-a-way.html

Banco de Portugal. (2024). *Metodologia de apuramento de resultados da Central de Balanços*. https://www.bportugal.pt/sites/default/files/anexos/QS_QES_metologia_apuramento_resultados.pdf

Barth, M. E., & Landsman, W. R. (2010). How did financial reporting contribute to the financial crisis? *European Accounting Review*, *19*(3), 399–423. https://doi.org/10.1080/09638180.2010.498619

Barth, M. E., Landsman, W. R., Young, D., & Zhuang, Z. (2014). Relevance of differences between net income based on IFRS and domestic standards for european firms. *Journal of Business Finance and Accounting*, *41*(3–4), 297–327. https://doi.org/10.1111/jbfa.12067

Belfo, F., & Trigo, A. (2013). Accounting Information Systems: Tradition and Future Directions. *Procedia Technology*, *9*, 536–546. https://doi.org/10.1016/j.protcy.2013.12.060

Bose, R. (2009). Advanced analytics: opportunities and challenges. *Industrial Management & Data Systems*, *109*(2), 155–172. https://doi.org/10.1108/02635570910930073

Bumblauskas, D., Nold, H., Bumblauskas, P., & Igou, A. (2017). Big Data Analytics: transforming data to action. *Business Process Management Journal*, *23*(3), 703–720. https://doi.org/10.1108/BPMJ-03-2016-0056

Bushman, R. M., Smith, A. J., Dyckman, T., Hemmer, T., Lazear, E., Lys, T., Mcconnell, J., Rajan, R., Sloan, R., Watts, R., Zimmerman, J., & Zingales, L. (2001). Financial accounting information and Corporate Governance. *Journal of Accounting and Economics*, *32*, 237–333.

Casta, J. F., & Ramond, O. (2016). Financial reporting and fair value: Where do we stand? In *IFRS in a Global World: International and Critical Perspectives on Accounting* (pp. 57–70). Springer International Publishing. https://doi.org/10.1007/978-3-319-28225-1_5

De George, E. T., Li, X., & Shivakumar, L. (2016). A review of the IFRS adoption literature. *Review of Accounting Studies*, *21*(3), 898–1004. https://doi.org/10.1007/s11142-016-9363-1

Decreto-Lei n.º 8/2007, Pub. L. No. 8/2007, Diário da República 378 (2007). https://diariodarepublica.pt/dr/detalhe/decreto-lei/8-2007-522813

Deloitte. (2019). *Revolutionizing reporting in the digital age*. https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Tax/dttl-tax-revolutionizing-reporting-in-the-digital-age.pdf

Deloitte. (2023). *Financial KPIs in a IFRS 17 World*. https://www2.deloitte.com/content/dam/Deloitte/us/Documents/financial-services/us-financial-kpis-in-a-ifrs-17-world-january-2023.pdf

Dolan, J. G., Veazie, P. J., & Russ, A. J. (2013). Development and initial evaluation of a treatment decision dashboard. *BMC Medical Informatics and Decision Making*, *13*(51), 1–9. http://www.biomedcentral.com/1472-6947/13/51

Eckerson, W. W. . (2011). *Performance dashboards : measuring, monitoring, and managing your business* (2nd ed.). John Wiley & Sons, Inc.

Elzahar, H., Hussainey, K., Mazzi, F., & Tsalavoutas, I. (2015). Economic consequences of key performance indicators' disclosure quality. *International Review of Financial Analysis*, *39*, 96–112. https://doi.org/10.1016/j.irfa.2015.03.005

Ernst & Young. (2024). *US GAAP versus IFRS: The basics*. https://www.ey.com/en_us/technical/accountinglink/us-gaap-versus-ifrs--the-basics-december-2024

Fikri, N., Rida, M., Abghour, N., Moussaid, K., & El Omri, A. (2019). An adaptive and real-time based architecture for financial data integration. *Journal of Big Data*, *6*(97), 25. https://doi.org/10.1186/s40537-019-0260-x

Graham, J. R., Harvey, C. R., & Rajgopal, S. (2005). The economic implications of corporate financial reporting. *Journal of Accounting and Economics*, *40*(1–3), 3–73. https://doi.org/10.1016/j.jacceco.2005.01.002

Hjelle, S., Mikalef, P., Altwaijry, N., & Parida, V. (2024). Organizational decision making and analytics: An experimental study on dashboard visualizations. *Information and Management*, *61*(6), 16. https://doi.org/10.1016/j.im.2024.104011

Hunton, J. E., Libby, R., & Mazza, C. L. (2006). Financial Reporting Transparency and Earnings Management. *American Accounting Association*, *81*(1), 135–157. https://www.jstor.org/stable/pdf/4093131.pdf?refreqid=fastly-default%3A474fed9cc5b835437c52401b08e5e84c&ab_segments=&initiator=&acceptTC=1

Janssen, M., van der Voort, H., & Wahyudi, A. (2017). Factors influencing big data decision-making quality. *Journal of Business Research*, *70*, 338–345. https://doi.org/10.1016/j.jbusres.2016.08.007

Kaplan, R. S., & Norton, D. P. (1992, February). The Balanced Scorecard-Measures that Drive Performance. *Harvard Business Review*, 11.

Kaplan, R. S., & Norton, D. P. (1996). Linking the Balanced Scorecard to Strategy. *California Management Review*, *39*(1), 52–79.

Knaflic, C. N. (2015). *Storytelling With Data: A Data Visualization Guide for Business Professionals* (1st ed.). Wiley.

Longitude Research. (2013). *Understanding investors: the road to real-time reporting*. Association of Chartered Certified Accountants. www.accaglobal.com/ri

Lönnqvist, A., & Pirttimäki, V. (2006). The Measurement of Business Intelligence. *Information Systems Management*, *23*(1), 32–40. https://doi.org/10.1201/1078.10580530/45769.23.1.20061201/91770.4

Orçamento do Estado para 2025, Pub. L. No. 45-A/2024, Diário da República 1 (2024). https://diariodarepublica.pt/dr/detalhe/lei/45-a-2024-901667918

Parmenter, D. (2015). *Key Performance Indicators :Developing, Implementing, and Using Winning KPIs* (3rd Edition). John Wiley & Sons, Inc.

Pauwels, K., Ambler, T., Clark, B. H., LaPointe, P., Reibstein, D., Skiera, B., Wierenga, B., & Wiesel, T. (2009). Dashboards as a service: Why, what, how, and what research is needed? *Journal of Service Research*, *12*(2), 175–189. https://doi.org/10.1177/1094670509344213

Pelger, C. (2016). Practices of standard-setting - An analysis of the IASB's and FASB's process of identifying the objective of financial reporting. *Accounting, Organizations and Society*, *50*, 51–73. https://doi.org/10.1016/j.aos.2015.10.001

Portaria nº 302/2016, Pub. L. No. 302/2016, Diário da República 4273 (2016). https://diariodarepublica.pt/dr/detalhe/portaria/321-a-2007-664305

Portaria nº 321-A/2007, Pub. L. No. 60/2007, Diário da República 1740(2) (2007).

https://diariodarepublica.pt/dr/detalhe/portaria/321-a-2007-664305

PricewaterhouseCoopers. (2007). *Guide to key performance indicators*. https://www.pwc.com/gx/en/audit-services/corporate-reporting/assets/pdfs/uk_kpi_guide.pdf

Raghunathan, S. (1999). Impact of information quality and decision-maker quality on decision quality: a theoretical model and simulation analysis. *Decision Support Systems*, *26*, 275–286. www.elsevier.comrlocaterdsw

Regulation (EC) No 1606/2002, Pub. L. No. 1606/2002, Official Journal of the European Communities (2002).

Rouhani, S., Ashrafi, A., Zare Ravasan, A., & Afshari, S. (2016). The impact model of business intelligence on decision support and organizational benefits. *Journal of Enterprise Information Management*, *29*(1), 19–50. https://doi.org/10.1108/JEIM-12-2014-0126

Roychowdhury, S., Shroff, N., & Verdi, R. S. (2019). The effects of financial reporting and disclosure on corporate investment: A review. *Journal of Accounting and Economics*, *68*(2–3), 1–27. https://doi.org/10.1016/j.jacceco.2019.101246

Sharda, R., Delen, D., & Turban, E. (2015). *Business intelligence and analytics : systems for decision support* (W. Stephanie, Ed.; 10th ed.). Pearson.

Stobierski, T. (2020, May 5). *13 Financial Performance Measures Managers Should Monitor*. Harvard Business School. https://online.hbs.edu/blog/post/financial-performance-measures

Suša Vugec, D., Bosilj Vukšić, V., Pejić Bach, M., Jaklič, J., & Indihar Štemberger, M. (2020). Business intelligence and organizational performance: The role of alignment with business process management. *Business Process Management Journal*, *26*(6), 1709–1730. https://doi.org/10.1108/BPMJ-08-2019-0342

Taleb, I., Serhani, M. A., Bouhaddioui, C., & Dssouli, R. (2021). Big data quality framework: a holistic approach to continuous quality management. *Journal of Big Data*, *8*(1), 41. https://doi.org/10.1186/s40537-021-00468-0

Tawse, A., & Tabesh, P. (2023). Thirty years with the balanced scorecard: What we have learned. *Business Horizons*, *66*, 123–132. https://doi.org/10.1016/j.bushor.2022.03.005

Tracy, J. (2009). *How to Read a Financial Report* (7th ed.). JOHN WILEY & SONS, INC.

Trigo, A., Belfo, F., & Estébanez, R. P. (2014). Accounting Information Systems: The Challenge of the Real-time Reporting. *Procedia Technology*, *16*, 118–127. https://doi.org/10.1016/j.protcy.2014.10.075

Trombetta, M. (2022). Financial Reporting and Macroeconomics. *European Journal of Finance*,

28(4–5), 314–325. https://doi.org/10.1080/1351847X.2021.1877166

Tufte, E. R. (2001). *The Visual Display of Quantitative Information* (2nd ed.). Graphics Press LLC.

US Securities and Exchange Commission. (2011). *A Comparison of U.S. GAAP and IFRS*.

Vasarhelyi, M. A., & Alles, M. G. (2008). The "now" economy and the traditional accounting reporting model: Opportunities and challenges for AIS research. *International Journal of Accounting Information Systems*, *9*(4), 227–239. https://doi.org/10.1016/j.accinf.2008.09.002

Vera-Baquero, A., Colomo-Palacios, R., & Molloy, O. (2016). Real-time business activity monitoring and analysis of process performance on big-data domains. *Telematics and Informatics*, *33*(3), 793–807. https://doi.org/10.1016/j.tele.2015.12.005

Yang, M., Sulaiman, R., Yin, Y., Mallamaci, V., & Alrabaiah, H. (2022). The effect of business intelligence, organizational learning and innovation on the financial performance of innovative companies located in Science Park. *Information Processing and Management*, *59*(2). https://doi.org/10.1016/j.ipm.2021.102852

Yigitbasioglu, O. M., & Velcu, O. (2012). A review of dashboards in performance management: Implications for design and research. *International Journal of Accounting Information Systems*, *13*(1), 41–59. https://doi.org/10.1016/j.accinf.2011.08.002