

***Business Intelligence – B  
Individual Report***

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# Introduction

## 1.1 Business Intelligence (BI)

Business intelligence (BI) is the application of strategies and technologies to examine business data and convert it into practical insights, empowering organisations to make decisions based on data. The process entails gathering data from both internal and external sources, organising it for analysis, executing queries, and generating data visualisations, dashboards, and reports to provide business users with access to the analytics findings. Business Intelligence (BI) tools empower users to retrieve diverse datasets and conduct thorough analysis to obtain valuable insights regarding the business's performance. (Stedman, C. et al., 2020) Business intelligence is a practice that enables organisations to become data-driven enterprises, enhance performance, and attain a competitive edge. It integrates diverse data analysis applications tailored to fulfill distinct requirements and is employed across a broad spectrum of industries, encompassing retail, insurance, manufacturing, and healthcare.

## 1.2 Overview of the Group Assessment.

Nokia, formerly a prominent brand in the mobile phone industry, faced challenges in adjusting to the rising popularity of smartphones and consequently experienced a decline in market share, yielding ground to rivals such as Apple and Samsung (et al., Gaudet, C. (2020). Nokia's decline can be attributed to several factors, including a pervasive bureaucracy that hindered decision-making, internal competition that was detrimental to the company, and a failure to recognise the significance of lifestyle products (et al., Doz, Y. (2017). A comprehensive study has been conducted by the group, which has proposed a suitable solution to address these issues and intends to present it to Nokia. Three tools were employed to ascertain the issues, facilitate decision-making, and discover solutions. The utilised tools include the Clear Idea framework, SAS EG, and V.I.S.A.

## 1.3 Report Outline

The report aims to examine the integration of business intelligence in companies to gain a competitive advantage and address specific business challenges. This study will analyse the business case of Nokia, focusing on their efforts to enhance customer satisfaction through the application of data science.The case study will utilise idea generation methodologies such as the clear ideas framework, as well as data analysis and visualisation software such as SAS Enterprise guide and V.I.S.A. The concluding section of the report will encompass recommendations for Nokia and a summary of the successful implementation of business intelligence strategies within the organisation.

# 2a. Business intelligence

## 2.1 Definition of business intelligence?

Business Intelligence (BI) enhances organizational decision-making by utilizing data analysis, offering improved transparency into crucial aspects such as inventory management, sales, and cost-efficiency. Executives derive substantial advantages from BI by embracing a data-centric approach to decision-making, leveraging statistical evidence and insights for decisions related to company expansion, process streamlining, and operational effectiveness.

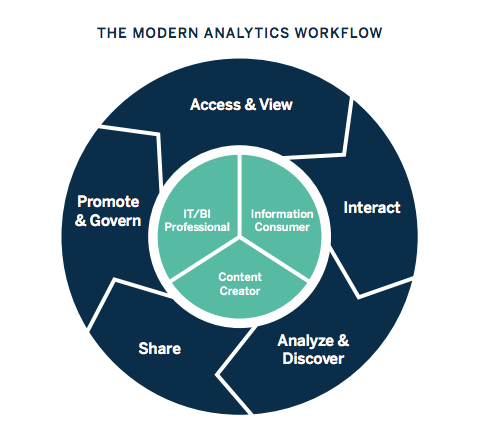


Figure 1: Modern Analytical Workflow  
Source: Tableau. (2022)

Business intelligence tools further enhance the speed of decision-making processes by efficiently analyzing various data sources, facilitating the recognition of potential areas for expansion and the delivery of valuable perspectives. Organizations utilize BI to attain cost-efficiency and enhanced profitability through process optimization and identifying opportunities that positively impact financial performance.

A diagram of a business intelligence life cycle

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Figure 2: Business Intelligence Life Cycle  
Source: Geeks. (2023)

The BI process is a systematic strategy that combines diverse technologies and methodologies to enable well-informed decision-making. It commences with the collection of data from both internal and external sources, such as transactional systems and databases. Subsequently, this data is integrated using methods like data warehousing and ETL. Various analytical techniques, including reporting, OLAP, data mining, and predictive analytics, are then employed to reveal trends and patterns. The processed data is displayed in a visual format using dashboards and reports, facilitating understanding. The acquired insights are vital for decision-making across all levels of the organization. Regularly monitoring key performance indicators (KPIs) helps ensure that the BI process stays aligned with the organization's goals, promoting continuous improvement. (et al.., Ghosh, R., Haider, S. D., & Sen, S. (2015)

Furthermore, BI enables the conversion of organizations into data-centric enterprises through a thorough evaluation of their operations, a deep understanding of customer behavior, and a careful analysis of market trends. Businesses can obtain a competitive edge by leveraging BI as a fundamental tool to improve decision-making, providing valuable insights, promoting a culture of data-driven decision-making, and ultimately increasing operational efficiency and profitability.

## 2.2 Evaluation of Business Intelligence

The use of business intelligence (BI) has become a focal point for both practitioners and researchers, reflecting the substantial impact of data-related challenges in today's business organizations (et al., hen, H., Chiang, R. H. L., & Storey, V. C. (2012)). A critical examination of BI implementation in the banking sector reveals the profound influence of technological, organizational, and environmental factors on its adoption and usage (et al., Bany Mohammad, A., Al-Okaily, M., Al-Majali, M., & Masa’deh, R. (2022)) This underscores the broader significance of BI in various industries, particularly in the context of Industry 4.0, where it plays a pivotal role in informed decision-making and adapting to dynamic market forces.

Existing literature emphasizes the multifaceted nature of successful BI implementation, emphasizing not only data and technology infrastructure but also the pivotal role of management and human resources support and capabilities. Furthermore, BI is recognized for its capacity to provide historical data for analysis and reporting, aid in crucial decision-making processes, and enhance the overall efficiency of business operations.

In conclusion, the critical appraisal of BI usage underscores its paramount importance in contemporary business organizations, showcasing its potential to elevate decision-making processes, enhance operational efficiency, and address the challenges of the modern business landscape. However, it also emphasizes the necessity for comprehensive planning that extends beyond technological considerations to fully unlock the benefits of BI, especially in specific sectors such as banking and within the transformative realm of emerging technologies like Industry 4.0 (et al., L ee, K., Choi, Saulina Panjaitan, A., & Apriliasari, D. (2022))

Additionally, the literature emphasizes various advantages of business intelligence (BI) in the process of decision-making, such as enhanced decision-making, increased effectiveness, adaptability to market dynamics, competitiveness, and revenue expansion. The benefits of BI highlight the importance of fostering a culture that relies on data and promoting innovation. Common challenges encountered during the implementation of business intelligence (BI) include technological intricacies, organizational synchronization, human resource limitations, data-related complications, and the need for an efficient decision-making system in a multifaceted business environment. These challenges highlight the need for a comprehensive approach that goes beyond technology in order to fully harness the transformative capacity of BI.

## 2.3 Resources Needed for Implementing BI in Organisations

The effective deployment of Business Intelligence (BI) in organizations relies on crucial factors for success (CSFs) and methodologies, which encompass a well-defined BI strategy and vision, the establishment of business requirements, support from both management and IT, guaranteeing data quality, the installation and integration of BI programs, system testing, and continuous support and maintenance, as identified in a study (et al., Ranjbarfard, M., & Hatami, Z. (2020)) . This approach focuses on resolving crucial concerns and efficiently distributing resources during the implementation of Business Intelligence (BI). In the banking industry, being prepared for the implementation of Business Intelligence (BI) requires having crucial resources like financial backing, technological infrastructure, and proficient personnel to efficiently deploy BI systems. In addition, a comprehensive strategy for implementing a data warehouse in a business intelligence (BI) setting prioritizes a unified structure that incorporates a range of technologies, such as reporting, online analytical processing, analytics, data mining, process mining, complex event processing, business performance management, benchmarking, text mining, predictive analytics, and prescriptive analytics. (et al., Tüccaroğlu, Bora, & Müesser, N. (2016)). These resources are crucial for achieving successful business intelligence implementation, promoting business flexibility, and facilitating well-informed decision-making in organizations.

# 2 b. Utilization of BI tools for Group Analysis

## 2.4 Clear Idea Framework

A group of speech bubbles

Description automatically generatedDr. Kamal Birdi has devised the CLEAR IDEAS framework, a systematic approach aimed at enhancing organizations' ability to generate and implement novel ideas with greater efficiency. Following a thorough investigation, 98% of respondents demonstrated strong concurrence or agreement regarding the efficacy of the CLEAR IDEAS model in resolving issues and its relevance to their job prerequisites.

A diagram of erupting volcano

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Figure 3: Clear Idea Framework

The model entails the process of developing a focused inquiry, gathering pertinent data, generating ideas, and methodically organising, refining, and nurturing the most favourable concepts. The framework emphasizes conducting thorough evaluations of these concepts according to established criteria, in order to identify the ones with the highest level of promise. The chosen concepts are effectively communicated, and a strategic plan is developed for their implementation, along with ongoing assessment of their impact. This methodical approach guarantees a thorough analysis of ideas, starting from identifying the problem to implementing chosen insights in a tangible manner.

Nokia has successfully incorporated the Clear Idea Framework into its business intelligence strategy, by implementing extensive training and support programs for employees throughout the entire organization. This framework functions as a valuable instrument in diverse domains, encompassing finance, marketing, and supply chain management. Nokia has observed significant enhancements in communication and decision-making processes through the implementation of the Clear Idea Framework. The framework promotes heightened collaboration among team members, facilitates more precise and succinct data analysis, and contributes to enhanced efficiency in data processing and reporting. The benefits of the framework highlight its effectiveness in promoting a methodical and organized approach to generating ideas and providing decision support, ultimately enhancing Nokia's overall operational efficiency.

## 2.5 SAS EG Implementation

SAS Enterprise Guide is a user-friendly software that allows users to analyse data and share their findings using a graphical interface and step-by-step guides. This tool facilitates rapid learning for efficient data investigations, automates code generation to enhance productivity, and expedites the deployment of analyses and forecasts. Nokia's business intelligence team utilises SAS Enterprise Guide, a robust tool, to analyse and visualise vast quantities of data. SAS EG provides analysts with a straightforward interface that enables them to effortlessly construct and execute intricate queries, generate personalized reports, and automate various tasks.

A diagram of data analysis

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Figure 4: The SAS EG analysis process flow

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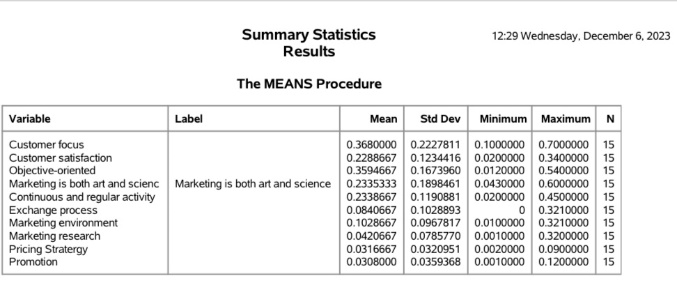
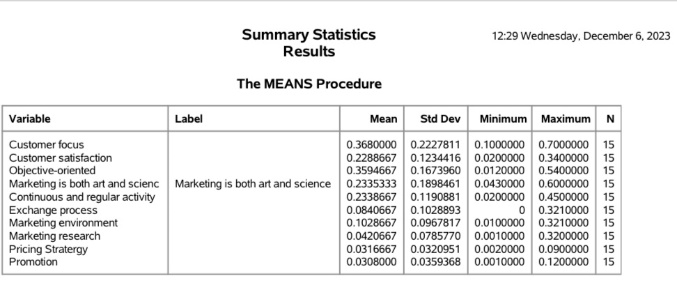
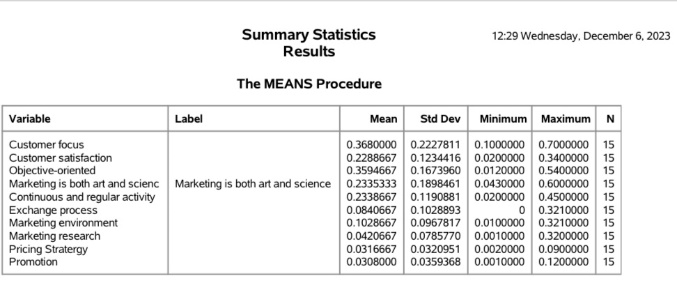


Figure 5: Report on Statistics and Data Visualisation  
Source: SAS EG 8.1

The attributes employed in this report encompass customer focus, customer satisfaction, ongoing and consistent activity, exchange process, marketing environment, the dual nature of marketing as both an art and a science, marketing research, goal-oriented, pricing strategy, and promotion. The results of the SAS EG evaluation, along with the chosen 4 attributes, were transferred to the subsequent analytical software, V.I.S.A. The topic will be addressed during the upcoming session.

## 2.6 V.I.S.A Implementation

The VISA Standard is a comprehensive decision-making tool that consists of a dedicated desktop application designed for both individual and group decision-making processes. The software provides a user-friendly graphical interface that is easy to understand and navigate. It presents a concise and straightforward summary of available options. Users can utilize interactive chart updates and visual reporting features to perform sensitivity analysis and personalize the interface with 'skins.' Integrating a project management interface improves the efficiency of an organization. Prominent characteristics encompass the capability to swiftly create decision models, quickly assign scores, instantly receive visual feedback on modifications, and observe outcomes in diverse graphical formats. The tool also allows for 'what-if' scenario analysis to evaluate the consequences of modifications on decision results. The VISA Standard facilitates efficient decision-making in various organizational projects by customizing the model's appearance for different audiences. This feature proves to be a valuable resource for saving time, reducing expenses, and improving the overall quality of decisions.

A diagram of a product

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Figure 6: V.I.S.A weightage representation of attributes  
Source: V.I.S.A

The attributes of the desired BI tool were categorised into Product, Price, Support, and Features using V.I.S.A. Each segment was assigned relevant attributes, and weights were determined for each segment using the mean values obtained from SAS EG. Additional examination and visualisation yielded graphical data, from which the top three attributes were determined. The most favoured features were Quality, Interface, and Integration.

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Figure 7: Visualisation of V.I.S.A.

Subsequently, the task at hand was to select a Business Intelligence (BI) software that offered the chosen attributes most optimally. Gartner's magic quadrant was utilized for the software comparison.

A close-up of a chart

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Figure 8: Gartner Magic Quadrant  
Source: Gartner. (2023)

This facility provides a graphical depiction of the market's primary participants categorized into four quadrants: leaders, challengers, visionaries, and niche players. This indicates the comparative positioning of these platforms based on their market presence and ability to achieve strategic objectives.

A close-up of a logo

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Figure 9: Tableau

By comparison of the ratings of the software on the Gartner website, it was determined that Salesforce (Tableau) is the most suitable business intelligence tool for the given requirement.

# 3. Barriers and drivers of BI Adoption in Organizations

Organizations encounter a range of obstacles and incentives when it comes to implementing Business Intelligence (BI). Primary obstacles encompass inadequate employee training, difficulties in data preparation and subpar data quality, the absence of robust leadership, restricted talent acquisition, and the imperative requirement for organizational support commencing from the C-suite. On the other hand, various factors can help in the adoption of Business Intelligence (BI). These include making investments in data and data preparation to unlock greater value, promoting a culture that relies on data with competent leadership, and implementing self-service capabilities to make it easier to use BI tools. To enhance the adoption of business intelligence (BI) and analytics, organisations must overcome these obstacles and utilise these factors to their advantage. This will enable them to make well-informed decisions based on data.

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Table 1: Reasons for Business Intelligence Success or Failure  
Source: Team, Y. (2012)

## 3.1 Examples of successful adoption of BI

1. **Netflix:** Netflix is a US-based streaming service that offers video content on demand through a subscription model. The service predominantly disseminates both original and acquired films and television shows across diverse genres, and it is accessible globally in multiple languages. Netflix demonstrates the successful implementation of Business Intelligence. Netflix utilises data analytics to examine user viewing patterns, preferences, and levels of interaction to provide tailored content recommendations. Their business intelligence tools efficiently handle large volumes of data to enhance content delivery, enhance user experience, and guide decisions regarding the creation of original content. The utilisation of data has played a pivotal role in the substantial growth of Netflix, establishing its dominance in the streaming industry. (et al., Mixson, E. (2021))

**A red letter on a black background

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Figure 10: Netflix

1. **Amazon:** Amazon.com, Inc. is a US-based multinational technology corporation that specialises in e-commerce, cloud computing, online advertising, digital streaming, and artificial intelligence. It is regarded as one of the prominent American technology companies, along with Alphabet, Apple, Meta, and Microsoft. Amazon has revolutionised its operations by extensively employing Business Intelligence and predictive analytics. Amazon enhances its supply chain by scrutinising customer behaviour, inventory levels, and market trends, thereby guaranteeing streamlined product delivery and inventory management. By employing Business Intelligence (BI) tools, Amazon has been able to accurately predict consumer demand, minimise shipping durations, and improve customer contentment, thereby solidifying its status as a prominent global e-commerce powerhouse. (et al., weDevs. (2022))

A black and orange logo

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Figure 11: Amazon

1. **Delta Air Lines:** Delta Air Lines is one of the major airlines of the United States. Delta Air Lines has effectively implemented Business Intelligence to enhance operational efficiency. Delta utilises business intelligence (BI) tools to analyse a range of factors, including flight data, customer feedback, and maintenance records. By utilising this capability, the airline can acquire valuable insights to facilitate strategic decision-making in areas such as scheduling, route optimisation, and aircraft maintenance, ultimately leading to enhanced overall performance. Delta Airlines' implementation of Business Intelligence (BI) has led to significant cost reductions, improved customer service, and a distinct advantage over competitors in the aviation sector. (et al., Gay, C. (2019))

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Figure 12 : Delta Air lines

## 3.2 Instances of Unsuccessful Adoption of BI

1. **FoxMeyer Drug:** During the 1990s, FoxMeyer Drug, a pharmaceutical distributor, encountered a monumental failure when trying to implement a sophisticated business intelligence and warehouse management system. The company made substantial investments in technology without fully understanding the complex issues associated with the integration process. The project, intended to streamline distribution processes, ultimately resulted in significant disruptions to operations, ultimately leading to bankruptcy. The failure of FoxMeyer Drug underscored the significance of conducting a comprehensive evaluation of implementation risks, comprehending the organisational consequences, and guaranteeing efficient change management. (et al., clearspider. (2020))

A large building with many windows

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Figure 13: Meyer Brothers Drug Company

1. **Hewlett-Packard (HP):** Hewlett-Packard (HP) encountered a setback in its implementation of business intelligence (BI) due to an overemphasis on data warehousing, neglecting to address the wider organisational requirements. The company made a significant investment in a data warehousing project; however, the complicated structure did not meet the anticipated outcomes. HP's BI initiatives suffered setbacks due to the absence of integration with other business processes and a failure to align with organisational goals. This resulted in inefficiencies and a lack of actionable insights. (et al., Baumann, B. (2022))

A blue circle with white letters

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Figure 14: Hewlett-Packard

1. **Levi Strauss:** Levi Strauss faced difficulties in implementing its business intelligence (BI) due to an inefficient strategy. The company made a financial commitment to acquiring BI tools without adequately providing training for its employees and without aligning the BI strategy with the objectives of the business. The outcome was a lack of effective utilisation of the BI system, limited user acceptance, and an inability to extract significant insights. The disparity between technology and organisational requirements highlighted the significance of adopting a comprehensive approach to implementing business intelligence. (et al., Sterlicchi, J., & Correspondent, U. S. (2008)).

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Figure 15: Levi Strauss (Levi’s)

# 4. Summary and Final thoughts

## 4.1 Overall Summary

This report provides an in-depth analysis of Business Intelligence (BI) and its incorporation into organisations, using Nokia as a specific example. Business Intelligence (BI) is the deliberate utilisation of advanced technologies to examine and interpret business data, transforming it into practical insights that facilitate well-informed decision-making. The report presents the group's evaluation of Nokia's difficulties and suggests remedies employing three methodologies: the Clear Idea Framework, SAS Enterprise Guide, and V.I.S.A. It highlights the importance of Business Intelligence (BI) in improving customer satisfaction through the use of data science applications. The critical appraisal examines the complex nature of implementing business intelligence (BI), emphasising its potential influence on decision-making, operational effectiveness, and ability to adapt to changing market conditions. The report additionally outlines the necessary resources for a successful implementation of business intelligence. The group analysis utilises the Clear Idea Framework, SAS EG, and V.I.S.A., demonstrating their respective functions in idea generation, data analysis, and decision-making. The success stories of BI implementation by Netflix, Amazon, and Delta Air Lines are compared to the failure stories of FoxMeyer Drug, Hewlett-Packard (HP), and Levi Strauss. This highlights the significance of strategic planning and aligning BI initiatives with organisational objectives.

## 4.2 Guidelines for effective implementation of BI

In order to guarantee the achievement of a Business Intelligence (BI) implementation, organisations should give priority to goals by concentrating on one or two business objectives at first, with the possibility of expanding after the initial integration. An explicit business intelligence (BI) implementation strategy, clearly stating objectives and advantages such as improved performance and well-informed decision-making, is essential. Comprehending user requirements and upholding simplicity in the implementation of Business Intelligence (BI) is crucial, guaranteeing that the selected software harmonizes effortlessly with the needs of the business. Adopting a systematic approach by following a ten-step guide for BI implementation, which includes delegating technical aspects to specialists, defining goals, and visualizing the future BI system, ensures a well-organized process. In addition, implementing optimal methods such as offering access to user-friendly business intelligence software, consistently evaluating and revising the business intelligence strategy, and keeping up with technological progress enhances the probability of achieving success in business intelligence. By implementing these measures, organizations can enhance the efficiency of their business intelligence (BI) systems to achieve optimal results. (et al., Kravchenko, I. (2021))

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