

Smart Data Management:

Achieving Business Impact with Data

Research Report
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1. Executive Summary

This research analyzes and evaluates Aosenuma's current Business Development Department and gives a specific Business Process Improvement by establishing an Automated Database System and Real-time KPI Tracking Dashboard.

As a framework, the approach employs Mixed Method Research and the Phase Consultancy Cycle. Methods of analysis include quantitative and qualitative methods, while data collection methods include interviews, secondary data use, desk research, and embedded research. These are expanded on throughout the report.

According to the findings of the study, the Aosenuma Business Development Team is in desperate need of deploying Business Data Analysis tools for more efficient operations. Specifically, with a focus on streamlining business processes, using a management system, and tracking and visualizing KPIs.

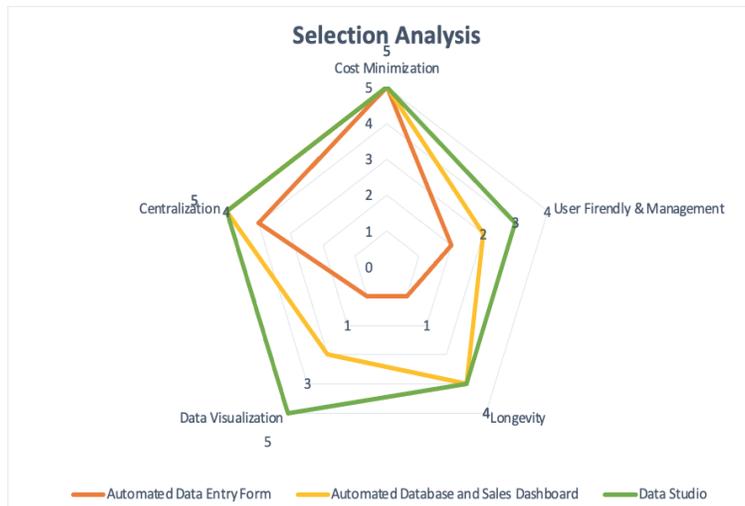
In conclusion, the organization does not employ a Business Data Analysis tool and has no funding for adopting one. This lack of tools and structure limits Business Development's ability to achieve its objectives. The project is guided by Aosenuma's *Three-Year Plan*, and target sub-objectives include:

- Systematizing the aosenuma virtual library
- Operation with a management system
- Developing a KPI-based reporting system

Ineffectiveness and a lack of internal competencies were investigated, and three main solutions were devised and assessed as a result.

1. Automated Data Entry Form
2. Automated Database and Sales Dashboard
3. Data Studio

The creation of a **Google Sheets Automated Database** and a **Google Data Studio Interactive Dashboard** were chosen and implemented based on the selection analysis.



As a result of the implementation, the Business Development process has been designed and optimized. KPI-based reports are already being used to develop data-driven objectives in strategic and operational meetings. The adaptability of the final solution enables for additional growth and development.

2. Definitions and Abbreviations

B2B – Business-to-Business

BDD – Business Development Director

Business Data Analysis Tools - Collects information from one or more business systems and stores it in a database

BDT – Business Development Team

CRM – Customer Relationship Management

Data Infrastructure - Data assets supported by people, processes, and technology (Open Data Institute, 2022)

Data Queries – “A database query is **either an action query or a select query**. A select query is one that retrieves data from a database. An action query asks for additional operations on data, such as insertion, updating, deleting or other forms of data manipulation” (Tech Target, 2022).

DBMS – Database Management System

ESG – Environmental, Social, and Governance

FPIC – Free, Prior, and Informed Consent is an important standard Indigenous people can use to claim their rights to self-determination, consultation, and participation in decision-making (United Nations Department of Economic and Social Affairs, 2016).

KPI - Key Performance Indicator

KPI Tracking - Monitoring the most relevant key performance indicators for increased business success (Calzon, 2021)

PC – Personal Computer

VBA – Visual Basics Applications

3. Preface

The structure of this research report is as follows:

Introduction: The research proposal is included in this part. The introduction's primary goal is to define the company's essential information, the context of the project, and the key parameters to be examined throughout the report. This section elaborates on the problem definition and project justification. Furthermore, the scope of the study and project is determined, and a thorough plan of the research and project is provided.

Phase I – Research & Definition: Phase I includes an overview of the theoretical foundation as well as the research technique employed throughout the report. This section defines key regions and concepts that are necessary to comprehend the rest of the report. Finally, a stakeholder analysis is provided, outlining the various stakeholders' main responsibilities and management.

Phase II – Clarification & Structuring: Clarification & Structuring lays the foundation for the next phase's solution. It determines which existing processes and KPIs will be incorporated into the solution. When an existing process or metric was found to be ineffective for solution development, it was redesigned or restructured to meet project requirements. The solution was created using these reformulations.

Phase III – Solutions Development: This section examines and evaluates the many alternatives created in relation to business requirements. Each solution is developed in detail, and then a selection analysis is performed to determine which solution is the best fit.

Phase IV – Implementation & Control: The business case is presented in the final section, which identifies the solution's additional value to the organization. The actions to ensure a successful knowledge transfer and continued usage of the tools implemented after my departure are outlined. A brief conclusion is included, summarizing the report's overall theme.

***The Research Proposal and Research Report are both included in this report. If you have already read the Research Proposal, please start at Phase II – Clarification & Structuring on page 25.**

Unless otherwise specified, this report was exclusively written by Alexander Dubson, a research student at HZ university of Applied Sciences and Business Data Analyst intern at Aosenuma, Mexico. Accordingly, support and information were generated within Aosenuma, implying that various team members and stakeholders were prepared to contribute time and resources to the research.

4. Introduction

Aosenuma B.V.

Aosenuma is one of the pioneer Mexican B2B strategic consultancy firms in sustainability and social performance. They visualize and contextualize environmental, social, and economic aspects for companies and projects, through the design, implementation, monitoring, and evaluation of strategic and innovative intervention models.

They specialize in generating social solutions to create, understand, repair, or strengthen the relationship between communities and development projects in 23 sectors, primarily: Mining, Oil & Gas, Infrastructure, Finance, and Startups.

Value Proposition

Aosenuma distinguishes itself in the market of Sustainability Consultancy by putting the onus on:

- Analyzing socio-environmental risks and impacts to assess the feasibility of investments.
- Taking part of clients' decision-making processes to achieve the best results based on continuous improvement principles.
- Promoting an integral responsible management by the companies that carry out the projects.
- Implementing positive impact strategies to achieve business sustainability over time.

Key Facts

Founded in late 2021, aosenuma is the result of a merger between three previously established companies: *Overflod Social*, *ANAF Energy*, and *Enûma*. Starting 2022, aosenuma has become a fast-growing business with a multidisciplinary team of 45+ specialists with ample experience in numerous markets and services related to sustainability and social development (Aosenuma, 2022). The merger of these enterprises resulted in the establishment of a client base of over 280 companies in critical sectors, allowing aosenuma to become a competitive leader in its emerging industry. Figure 1 showcases the merger timeline and milestones leading to the creation of aosenuma.



Figure 1 Aosenuma Timeline

Focus Areas and Services

Aosenuma's operations are separated into four primary areas, each of which provides clients with specialized services. Then, based on the demands of the client, these services are contextualized to deliver unique projects.

Research and Analysis

- Social Impact Assessment
- Human Rights Impact Assessment
- Feasibility assessment
- Red flag report / Risk Assessment
- Due Diligence / Gap Analysis
- Community Analysis of Rights to be Consulted
- Impact Measurement

Applied Social Solutions

- Community Consultations
- Social Management Plan
- Socialization of projects
- Outreach with stakeholders
- Social and Environmental Management System
- Strategic impact consultancy

ESG

- Gap analysis
- Materiality Studies
- Sustainability strategy
- Responsible Investment Policy
- Global assessments (GRESB / CSA / CDP)
- Sustainability reporting: SASB + TCFD

Social Intelligence

- Conflict resolution
- Negotiation of agreements
- Indigenous Consultation (FPIC)

Objectives

The partners at aosenuma have established a *three-year plan* with four main objectives and sub-objectives to help them grow strategically in the coming years. These will help aosenuma establish itself as the industry leader and allow for rapid market growth. This project is aligned with these objectives, and the project's final solution will help achieve some of these sub-objectives. These will be discussed in the next section.

Three-Year Plan

1. Become leaders in the “Social” of ESG

- Maintain our leadership in the electricity sector.
- To be the leading consulting firm in social issues for the extractive industry: Mining and Oil & Gas.
- Expand our participation in infrastructure projects.
- 50% of multi-year contracts
- To be a benchmark of success and professionals in the accompaniment of FPIC
-

2. Be the One-Stop-Shop for implementation of ESG aspects

- Triple the number of investment funds as clients.
- Have 10 startup clients with ESG Phase Zero.

3. Systematize our performance

- Completion of manuals and operating procedures.
- Systematize the aosenuma virtual library.
- Establish internal evaluation mechanisms.

4. Consolidate corporate governance

- Operation with a management system
- Development and implementation of HR policies.
- KPI-based reporting system.
- Development of aosenuma materiality study.

Business Development

As a Business Data Analyst for this project, I've been asked to assist in the development of the data infrastructure required for the Business Development team's efficient operations. This implies assisting the team in developing the tools and processes required to support Business Development activities. The following section will delve more into what this entails.

The team consists of three employees, including myself, the Product Manager, and is led by one of aosenuma's partners as the Business Development Director (BDD). Sales, Project Management, Product Management, KPI Tracking, and Customer Relationship Management are all priorities for the business development department and key features to consider in my project.

The primary responsibilities of the Business Development Department are to generate new sales leads, forecast sales revenue, evaluate current sales performance, and identify ways for the organization to expand and grow (Ehrlich, 2022). As a result, the Business Development Director and I have aligned some of the sub-objectives from the *three-year plan* and established them as priorities for this project to focus on. The following objectives are closely related and relevant to “building the data infrastructure” (Ehrlich, 2022) ; each is briefly explained:

1. **Systematize the aosenuma virtual library:** The term "virtual library" refers to aosenuma's clients/projects library. Historically, these have been saved manually in excel files, however there is no uniformity and standardization. As a result, aosenuma wants for customers and individual projects to be labeled and identified, with the ability to track them as the company continues to grow. As an outcome the Business Development Team will be able to identify major client portfolios and continue to expand the services it provides to them.
2. **Operation with a management system:** A management system can assist aosenuma in improving their performance by identifying streamlined steps that the company actively utilizes to achieve their goals and objectives. As described by the International Organization for Standardization, these systems can help foster an organizational culture that engages in a sustained cycle of self-evaluation, adjustment, and refinement of operations and processes through increased employee awareness and management leadership and commitment (ISO, 2022).
3. **KPI-based reporting system:** Measurement, organization, and analysis of the most important business key performance indicators are made easier with a KPI reporting system. These studies may assist aosenuma in achieving their objectives, identifying strengths, weaknesses, and trends. In discussion with the Business Development Director and Product Manager this report must be presented in an interactive dashboard with visual representation of the associated data (Hernández, 2022).

Key Opportunity

The goal for Aosenuma is to quickly optimize and rapidly expand its business operations. To achieve this goal, Aosenuma must consolidate its business processes and create the foundation for easy and insightful data analysis. I presume that by focusing on the three sub-objectives (*Systematizing the virtual library, operating with a management system, and integrating a KPI-based reporting system*), Aosenuma will be able to structure the tasks completed in Business Development and provide the necessary tools and analyses for long-term growth.

Problem Statement

After working closely on assignments with the Business Development Department and interviewing different stakeholders for a few weeks, the following conclusion can be drawn:

“Aosenuma's Business Development department lacks the business analytics tools and established processes required to effectively manage rapidly expanding operations. Furthermore, there are no data-savvy employees on staff, and no funds have been set aside to construct the necessary Business Development solutions.”

Project Justification

The Business Development Department's mission is to ensure that the company is meeting its sales goals, reaching out to new clients and markets, and providing excellent customer service. The department will be unable to manage these tasks and extract value from its data unless it has the appropriate business data tools and processes in place. As a result of the Business Development Director's and company partners' requests, my role as a Business Data Analyst in Aosenuma is to research and develop the solutions required to support an efficient business development team. Since the team has no budget or data-driven employees, completing this project is critical to generating a low-cost solution and fostering a data-driven team culture.

Project Scope

The scope of this project establishes its bounds, allowing it to stay focused and avoid wasting resources on unrelated concerns later on.

In Scope

This project will concentrate on defining the core business process for the Business Development Department, as well as building data analytics tools to support and improve that process. The scope includes the Business Development Department, firm partners, and related stakeholders.

It is expected that the relevant information and comments will be provided by Aosenuma stakeholders in a timely and productive way for this project to be completed effectively.

Out of Scope

All activities outside the scope of the Business Development Department, i.e., all departments not included in the Business Development process, are out-of-scope for this project.

Constraints

If the project encounters limitations, these can be a source of risk and should be further defined. For this project, the following constraints apply:

Scope Creep

Adding new features or functions to the planned solution, imposing requirements, or performing labor that is not approved can lead to project failure (Larson, 2009). Stakeholder expectations (Company Supervisors and HZ Assessor) must be aligned and met.

Quality

If the quality of the deliverable does not meet expectations, the company's checking and reviewing expertise is insufficient, omissions occur, required technical training is longer than anticipated, and/or the design is not feasible, the project will fail.

Planning

If the project falls behind schedule, resources cannot be secured as anticipated, and stakeholders demand excessive consultation, the project can be at risk of nonperformance.

Risk Management

If important risks are not defined and communicated with stakeholders, or unauthorized risks are introduced into the project, the project may be unsuccessful.

Communication

If stakeholders do not receive adequate communication and the project stakeholders are unaware of project progress the project is jeopardized.

Stakeholders

The project is at risk if stakeholders delay the project due to unforeseen circumstances, introduce additional scope unagreed in the project planning, stakeholders disregard project communications, and/or company does not approve the design.

Costs

Since there is no budget for the project, it may become a constraint afterwards. The project will focus on finding low-cost solutions; however, the effectiveness of these solutions may be limited when compared to more expensive alternatives. This is not anticipated as a major issue, but it is a factor to take into consideration in the project.

Planning

Figure 2 depicts a Gantt chart that displays the preliminary project timeline:

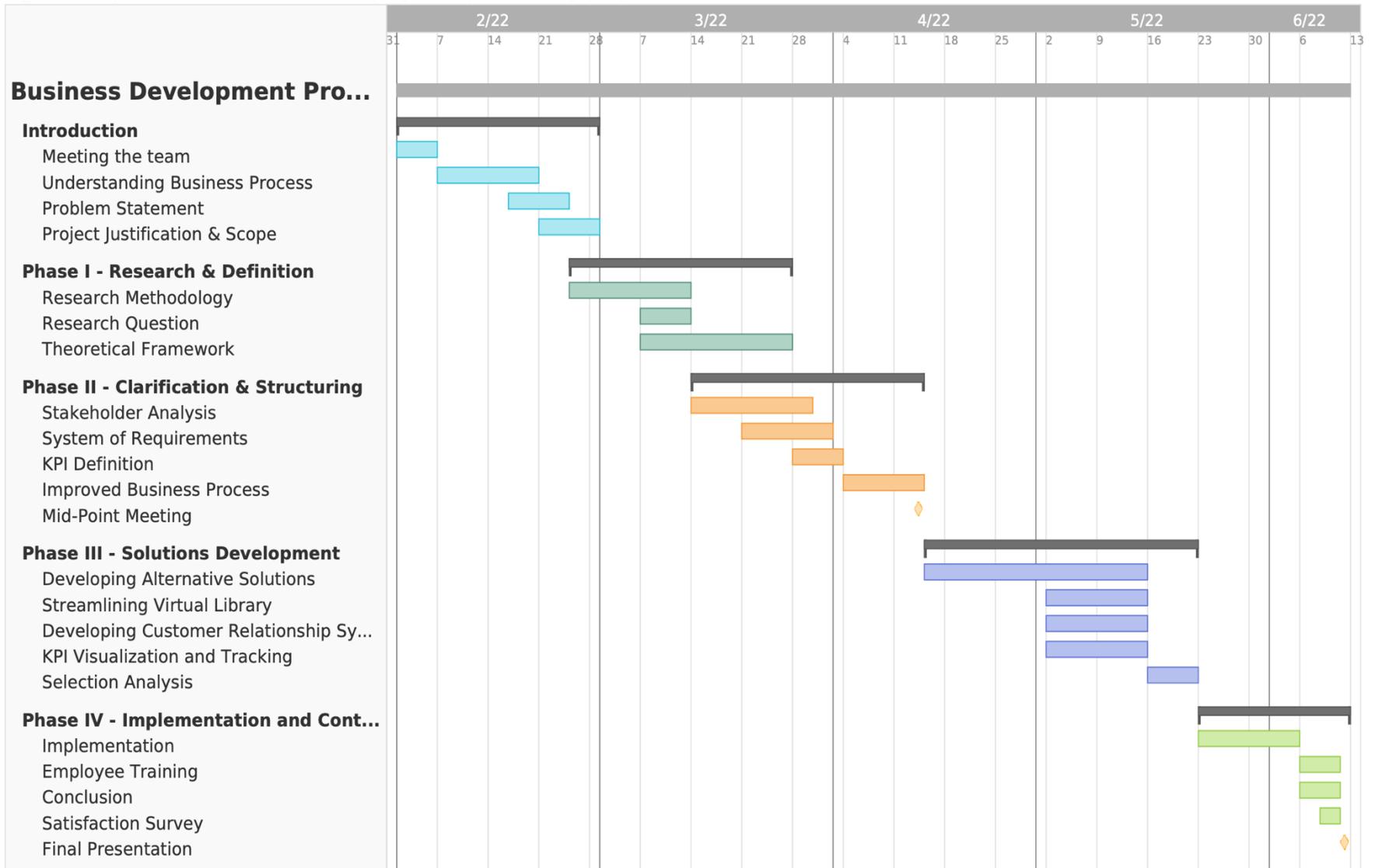


Figure 2 Gantt Chart

Phase I – Research & Definition

5. Research Methodology

According to C.R. Kothari in his book Research Methodology: Methods and Techniques research methodology is understood as “the application of mathematical, logical and analytical techniques to the solution of business problems of cost minimisation or of profit maximisation or what can be termed as optimisation problems” (Kothari, 2004). This part allows the reader to critically assess the whole research's validity and reliability. It primarily discusses how the data was gathered, created, and evaluated. To delve deeper into this, it appears necessary to first define the research question.

Research Question

After deciding what to research, specifically after specifying and determining the scope of the project and the objectives of the research, the first step is to develop the research question.

The question is phrased in the following manner:

To what extent and in what ways can the creation and deployment of Business Data Analysis tools assist the Business Development Department's processes in meeting aosenuma's three-year plan objectives?

- 1. What is the role of Business Development in aosenuma's three-year plan?**
- 2. What is the key and most relevant process within Business Development?**
- 3. Which Business Data Analytical tools are essential in Business Development?**
- 4. What are the most relevant objectives to focus on in the project?**
- 5. What are some other considerations to make throughout the Business Process Improvement?**

Methodological Approach

The methodological approach used in this study aims to systematically analyze the current Business Development Process and its impact on meeting the three-year plan objectives of aosenuma.

A combination of qualitative and quantitative data is used to calculate the validity, practicability, and impact of various approaches. This is the best approach because reliability and impact can be clearly expressed and analyzed using statistical analysis methods.

All data is based on a combination of primary and secondary data collected and shared by key stakeholders at aosenuma. To ensure the accuracy of the data, the following Research Question and Method Relevance matrix was developed to connect sub-research questions with specific methods of research.

| Sub-Question | Relevant Business Parameter | Theoretical Framework | Research Deliverable | Type of Research Question | Research Method | Data Source | Quality/Validity/Ethical Aspects |
|--|------------------------------------|--|--|----------------------------------|------------------------------|---|---|
| What is the role of Business Development in Aosenuma's three-year plan? | Business Development roles | Business Development Role | Relevance of Business Development Department in Aosenuma | Qualitative | Interviews | Business Development Director | Abstract Definition by Aosenuma |
| What is the key and most relevant process within Business Development? | Information Flow | Business Development Business Process | Improvement Opportunities | Qualitative | Observation | Existing Information Flow | Researcher Bias |
| Which Business Data Analytical tools are essential in Business Development? | Data Analysis tools | Customer Resource Management | Relevance of Business Data Analytical Tools | Quantitative/Qualitative | Measurements/Desk Research | Literature/Aosenuma Systems | Prove Validity/Confidentiality of Data |
| | | Centralized Database Management System | | | | | |
| | | KPI Tracking | | | | | |
| What are the most relevant objectives to focus on in the project? | Three-Year Plan | Systematize the aosenuma virtual library | Requirements & Objectives | Qualitative | Observation | Aosenuma Three-Year Plan | Limited Information |
| | | Operation with a management system | | | | | |
| | | KPI-based reporting system. | | | | | |
| What are some other considerations to make throughout the Business Process Improvement? | Company Department | Strategic Rationale | Change Implementation | Qualitative/Quantitative | Interviews/Feedback Sessions | Business Development Director & Product Manager | Stakeholder Interviews |

Matrix 1 Research Questions and Methods Relevance

Mixed Methods Research

Mixed methods research (MMR) is a research methodology that collects, analyzes, and evaluates both quantitative and qualitative data to investigate an elemental anomaly. The research method does not try to undermine either qualitative or quantitative research methods, but rather to capitalize on the advantages and mitigate the disadvantages of each approach. The combination of primary and secondary data sources allows for a more in-depth understanding of the research problem. According to (Johnson, 2007), the combination of elements allows for the breadth and depth of comprehension and confirmation. The goal of this research is to find new solutions using mechanisms and formulated learning, which is why MMR is essential for designing well-founded processes.

From a collection of disparate evidence with the same goal in mind, a single conclusion will be reached. The utilization of data in Figure 3 clearly exemplifies the mixed approaches principle. The objective of the research is found at the top, which in this case will be to identify solutions to Aosenuma's present challenges. Then, for the same problem, qualitative (yellow) and quantitative (blue) data is collected, reviewed, and integrated. Calculated inferences can only be confirmed by combining the facts, which will then justify the proposed solutions.

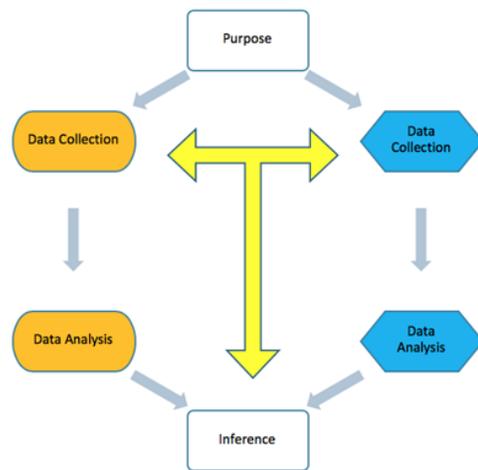


Figure 3 Mixed Methods Research

6. Research Model – Phase Consultancy

The consultancy model is a data-driven improvement cycle, commonly used to evaluate and optimize processes and designs. According to Milan Kubr in Management Consulting: A Guide to the Profession, in a standard consulting engagement, the consultant and the client engage in a series of actions to achieve the intended goals and improvements. This process has a distinct beginning (the relationship is established, and work begins) and end (the consultant departs). The procedure can be broken into multiple phases between these two points, allowing both the consultant and the client to be scientific and deliberate as they move from phase to phase and operation to operation (Kubr, 2002).

In the field, there are numerous approaches to divide the consulting cycle, into distinct phases. Models ranging from three to ten phases have been proposed by various writers, most common being the Kolb-Frohman model (Kolb & Frohman, 1970). I've decided to develop my own simple four-phase approach, which includes (Research & Definition, Clarification & Structuring, Solutions Development, and Implementation & Control). I've termed this model Phase Consultancy.

This model, depicted in figure 4, will serve as a guidance for the rest of the report.

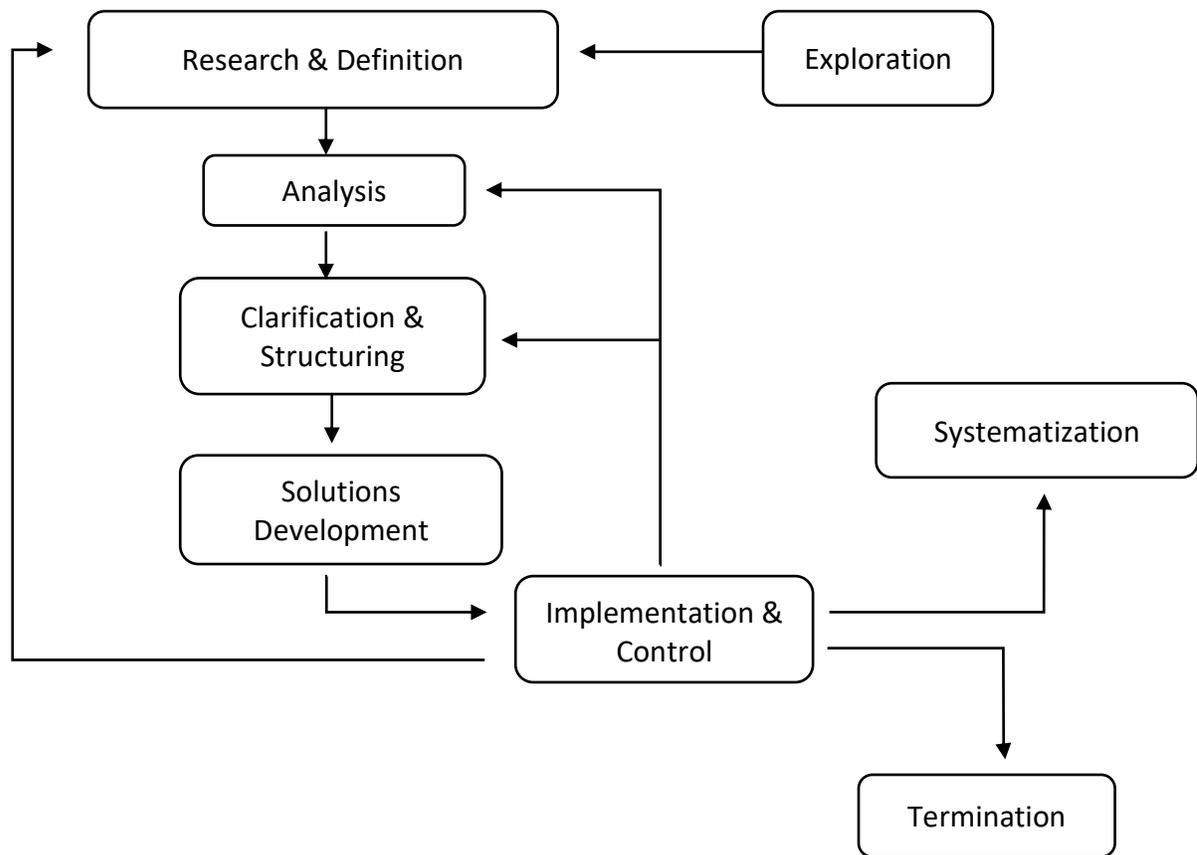


Figure 4 Phase Consultancy

EMethods of Data Collection

Data is collected in 4 ways:

- **Interviews:** This method was chosen because the research is being conducted at a small corporation where people are accessible and open to collaborate. To properly get a feel for the strengths and weaknesses of each functional area, manager and personnel contact is required.
- **Use of secondary data;** The use of hard data was used to back up claims and show that everything is factual.
-
- **Desk research:** This method is used to explore concepts and gain further understanding into research questions.
- **Embedded research:** This form of research is the main way of gathering qualitative data. Investigating while working in other assignments was a great way to gain insight and a direct feel for the specific processes.

7. Theoretical Framework

To be able to answer the previously mentioned questions succinctly and to finally come up with a solution, it is necessary to first design a theoretical framework that allows for continuous monitoring, revision, and adjustment of project progress as well as efficient activity planning. The theoretical framework is the structure that holds or supports a research study's premise. It is made up of concepts and their definitions, as well as existing theories that are being utilised in the research (Sacred Heart University, 2022).

As a result, the definition of different concepts is developed.

Customer Resource Management (CRM)

Customer relationship management (CRM) is a tool for managing the company's customer and potential customer relationships and interactions. The idea is straightforward: improve business contacts to expand the organization. A customer relationship management system (CRM) aids businesses in staying in touch with customers, streamlining procedures, and increasing profits (Sales Force, 2022).

Centralized Database Management System (CDMS)

Database Management Systems (DBMS) are computer systems that store, retrieve, and execute data queries. A database management system (DBMS) acts as a link between a user and a database, allowing them to create, read, update, and remove data in the database.

Users and other programs can manipulate and extract data using DBMSs, which manage the data, the database engine, and the database schema. This contributes to data security, data integrity, concurrency, and consistent data management techniques. DBMS provide several advantages over standard file systems, including greater flexibility and a more complicated backup scheme (Cisco, 2022).

KPI Tracking

The tools and methods that businesses use to monitor performance metrics are referred to as KPI tracking. Measuring key performance indicators (KPIs) entails gathering specific data and transforming it into useful metrics that can be measured and reported in easily understandable charts and dashboards (SiSense, 2022).

The everyday activities of every business create data that may be monitored and evaluated to determine effectiveness. These measurements can then be used to make operational changes.

KPIs provide insights into different areas of an organization's operations and may be tailored to unique needs, sectors, and divisions.

However, KPI tracking entails more than just gathering data. Placing these indicators into a larger framework can help evaluate if they suggest a degree of improvement or a need to optimize certain parts of a business.

Strategic Rationale

Working strategically entails being forward-thinking, proactive, predictive, and capable of making decisions based on evidence and calculated predictions. This typically necessitates a sense of assurance in the decision-making process, which is not solely based on proof-of-concept.

As a result, the strategic rationale outlines the logical steps to arrive at the final recommendation. The rationale is delivered in five stages, beginning with analyzing and understanding the big picture and concluding with delivering a solution. The rationale is based on iterative communication with the client to align business objectives and requirements at each stage of the process.

Furthermore, the rationale's methodical structure ensures that the project remains at a strategic level with empirical and measured findings to back up final recommendations. Figure 5 depicts the strategic rationale used throughout the project. The strategic rationale may have similarities to the Phase Consultancy model; however, the strategic rationale provides a “descriptive description of the processes in terms of process elements and rationale behind them” (University of Computer Science Toronto, 2022).

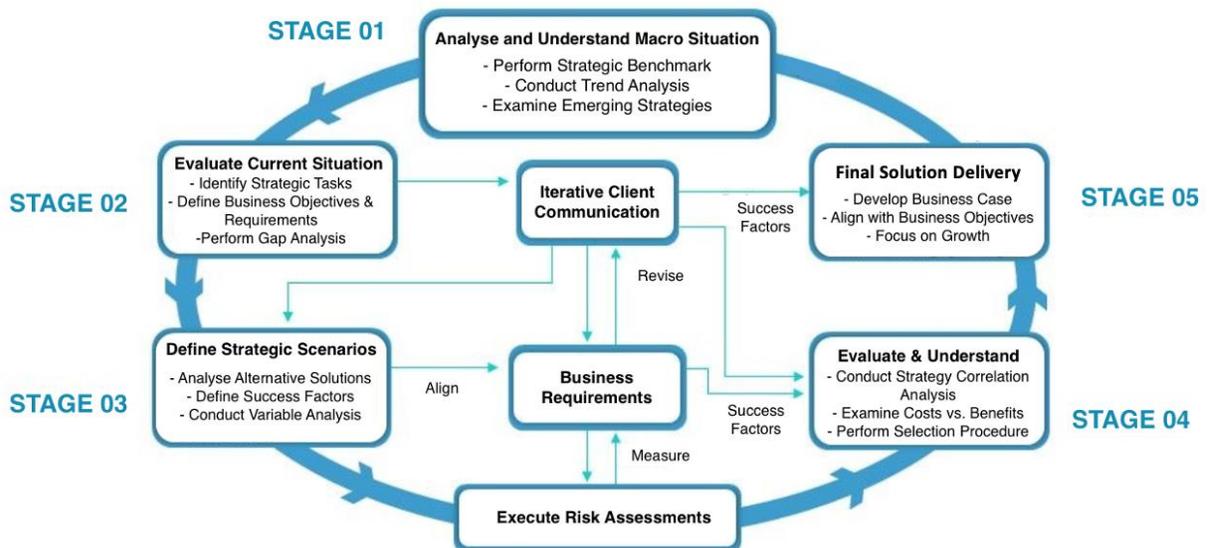


Figure 5 Strategic Rationale

Data Categorization

As a result of its efforts, the Business Development Department deals with a variety of data sources and kinds. Because BD activities extend from marketing and lead generation to customer satisfaction and project management, this section will categorize the many data types under consideration for the study.

Customer Data

Customer data refers to the behavioral, demographic, and personal data on customers that allows to better understand, interact, and engage with them (Deshpande, 2021). The Business Development Department at Aosenuma exclusively collects demographic and market data, as well as information on its clients. This data is utilized to better analyze and track major clients, industries, impact areas, and expansion potential. The data types listed below are relevant and will be considered when developing the final solution:

- *Client #*
- *Company*
- *Business Name*
- *Country*
- *State*
- *Municipality*
- *Sector*
- *Contact Information*

Project Data

All proprietary data generated by project operations and transactions, documents, and related information, which the Business Development Team receives and processes while providing their services, is referred to as Project Data (Law Insider, 2022). This information is essential for tracking project progress and completion. It also aids Aosenuma in determining which services they provide the most and which services they should work on improving. When a client accepts an offer, project data is tracked, and important factors are used to assign responsibilities and ensure that the project is delivered on time. These data types include:

- *Project Name*
- *Date proposal was sent*
- *Client Acceptance Date*
- *Acceptance Probability*
- *Starting Date*
- *Delivery Date*
- *Business Area in Charge*
- *Service offered*
- *Product offered*
- *Project Start Probability*
- *Date of Payment*

Financial Data

In terms of financial statistics, the Business Development Department keeps track of the number of proposals made to clients, how much money they requested, and how many of these proposals were commissioned and amount incurred. This data is crucial to the project because it tracks the company's progress and can aid in the development of important metrics and sales KPIs.

The four data kinds are as follows:

- *Amount Quoted*
- *Incurred Amount*
- *Presented Proposals*
- *Projects Sold*

Lead Generation Data

The identification of potential clients is referred to as data-driven lead generation. B2B contact and intent data is frequently used by the Business Development Department to locate potential prospects at scale. Fresh data aids in the prioritization of sales and boosts the relevancy of the prospect pool (Datarade, 2022). Although Aosenuma now lacks a lead generating database, the following data types used by BDT in lead generation are applicable to this project:

- *Contact Date*
- *Meeting with Prospect Date*
- *Company*
- *Country*
- *Contact Information*
- *Sector*
- *Person Responsible*
- *Status (Prospect, Lead, Proposal, Client)*

8. Stakeholder Analysis

Figure 6 gives an overview of all stakeholders involved in the project. They have been appointed to the appropriate power and interest levels.

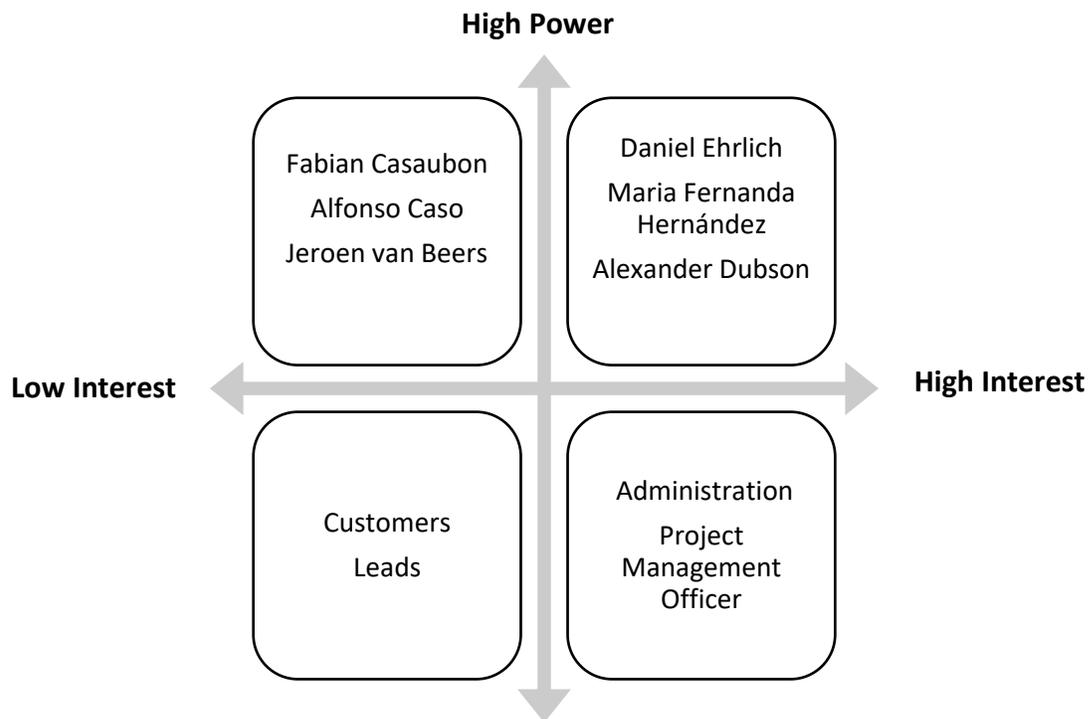


Figure 6 Stakeholder Analysis

Low Power

Firstly, Internal stakeholders have the most influence on the project. They can be prioritized as primary or active. Name, position, and influence level is presented in Table 1.

Table 1 Internal Stakeholders

| Name | Description | Influence (0-5) | Interest level (0-5) | Total |
|-----------------------------|--|-----------------|----------------------|-------|
| Daniel Ehrlich | Company partner/ Oversees Business Development | 5 | 5 | 10 |
| María Fernanda Hernández | Business Development Director | 4 | 5 | 9 |

Secondly, External stakeholders are not directly involved in the project, but can influence or be influenced by project results. They can be prioritized as secondary or passive.

Table 2 External Stakeholders

| Name | Description | Influence (0-5) | Interest level (0-5) | Total |
|----------------------------|---|-----------------|----------------------|-------|
| Fabian Casaubon | Company Partner | 4 | 3 | 7 |
| Alfonso Caso | Company Partner | 4 | 2 | 6 |
| Project Management Officer | In charge of managing operations | 2 | 5 | 7 |
| Administration | Takes care of administrative duties with projects | 3 | 4 | 7 |
| Customers | Customer Satisfaction | 1 | 3 | 4 |
| Leads | Market Leaders | 1 | 1 | 2 |
| Jeroen van beers | HZ Supervisor | 3 | 4 | 7 |

Thirdly, Mediante stakeholders serve both as internal and external stakeholders since they possess confidential information about the company to provide services that aid the company's objectives, for example, consultancy agency.

Table 3 Mediante Stakeholders

| Name | Description | Influence (0-5) | Interest level (0-5) | Total |
|------------------|-----------------------|-----------------|----------------------|-------|
| Alexander Dubson | Business Data Analyst | 5 | 5 | 10 |

Stakeholder Management

After describing the project's relevant stakeholders, I'll go over their particular roles in the project, how they'll be managed, and why they're important to the solution's success. These will be presented in order of relevance, from highest to the lowest:

- Daniel Ehrlich's (Business Development Director & Company Partner) input and feedback will determine the project's parameters, scope, deliverables, and success. Weekly communication will be established and will be an ongoing component of the project's development.
 - o Role: Primary Client and supervisor.
 - o Expected time allocated to project: 1-2 hours a week
- Maria Fernanda Hernandez (Project Manager Officer) and I will collaborate closely in establishing the project and identifying key issues in the company. We'll have weekly meetings and feedback sessions to help us steer the project. She is key in gaining operations insight and knowledge:

- Role: Primary Client
 - Expected time allocated to project: 3 hours a week
- Fabian Casaubon and Alfonso Caso (Company Partners) will not be directly involved in the project's development. It was agreed that there should be little communication with them because they will provide feedback through Daniel Ehrlich. They are valuable to the project as they are Company Partners and will utilize some of the solutions delivered by the project. Their feedback and satisfaction with my services will determine the success of my solutions. The only planned communication sessions with them are the Intermediate meeting and the Final presentation.
- Role: Secondary Clients
 - Expected time allocated to project: Not determined
- Administration's role in the project is unclear. They are regarded as a relevant stakeholder because their operations both contribute to Business Development and rely on the team's activities. Only a few interviews with the Administration Department will be scheduled to define their function in the company and their role in the Business Development Process.
- Role: Information Sources
 - Expected time allocated to project: Interview Sessions
- Jeroen van Beers (HZ Supervisor) role in the project is to provide feedback and guidance at different stages. His involvement is critical in ensuring successful delivery of university deliverables and determining the overlap between the HZ and company project. His suggestions will be used to alter project specifications in order to ensure the greatest possible solution delivery.
- Role: University Supervisor
 - Expected time allocated to project: Will be determined based on university deliverables

Phase II – Clarification & Structuring

Sub- Research Question

4. What are the most relevant objectives to focus on in the project?

While some key project and company information surfaced in Phase I – Research & Definition; Phase II – Clarification & Structuring is a methodical technique to gaining information about the different business parameters and requirements relevant to the project. Clarification is the process of refining and understanding the current situation of the organization and draw meaning from the information obtained. Structuring is the subsequent process of laying the groundwork and organizing the areas of focus for consulting activities. By structuring essential processes and data, I can then use them as a baseline for developing solutions.

9. Sectors of Operation

Aosenuma currently provides services and products in 23 sectors, Appendix 1; and according to the Business Development Director, there is no sales or growth strategy per sector. Because of aosenuma's extensive service and product portfolio, this method has worked so far; but this reactive approach does not allow for business planning. Aosenuma must define its main sectors, devise plans, and monitor KPIs to assess its success and target growing markets.

The issue is not the number of sectors in which aosenuma engages in, but rather the lack of strategy implementation. Aosenuma cannot assess its existing performance or build business growth strategy until its key sectors are defined. As a result, the next section will assist aosenuma in identifying their core sectors based on prior operations and use these as a growth metric and benchmark to apply similar methods to other sectors.

Key Sectors

To determine the primary sectors in which aosenuma operates, I will use two essential metrics: projects sold per sector in 2021 and revenue per sector as a percentage of total business sales in 2021. These data points were straightforward to detect because aosenuma has already recorded the sector and sales per company. The data source was provided by Aosenuma's administration department; however, the sales database cannot be published owing to data confidentiality. The following figure was derived through a comparison of revenue and project sales.

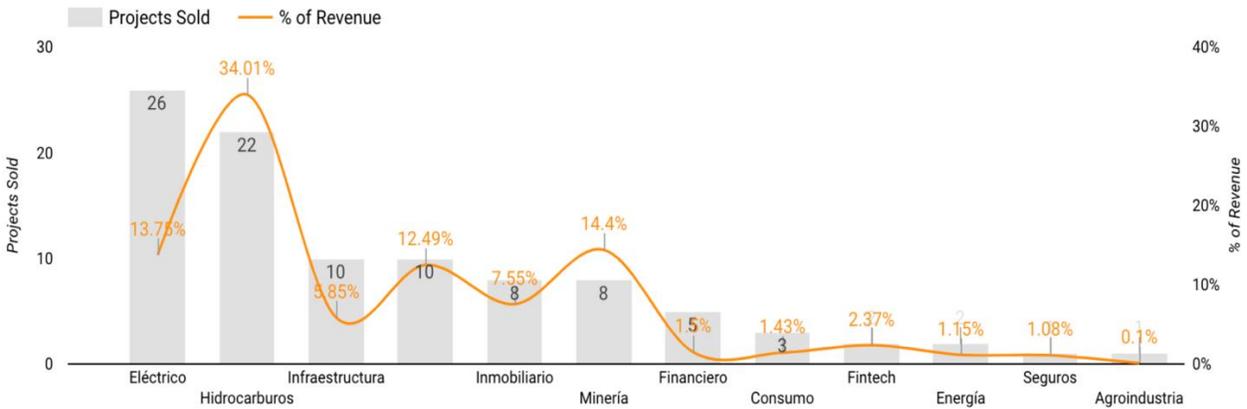


Figure 7 Sales by Sector

Observation

Electric (Eléctrico), Oil & Gas (Hidrocarburos), Infrastructure (Infraestructura), Real Estate (Inmobiliario), and Mining (Minería) are the main sectors for Aosenuma, according to this data. The fact that ten projects and roughly 12.5% percent of total revenue were not ascribed to any sector was an interesting finding in this analysis. This is the result of failing to identify critical sectors, maintain a well-organized database, and establish sector-specific strategy.

It's also worth noting that the number of projects sold does not correspond to the percentage of overall revenue. As shown in figure 7, projects sold in Mining account for 8% of project sales but contribute to 14.4% of total revenue. Electric projects, on the other hand, account for 26% of all projects sold but only 13.75% of total revenue.

Conclusion

After presenting these findings to the Business Development Director, it was determined to prioritize **Oil & Gas, Mining, Finance, and Infrastructure**. Oil & Gas and Mining were preferred as these two represent the largest contributors to total revenue. Infrastructure and Finance, on the other hand, were selected because they contributed the least to overall revenue from the top six sectors. I made the decision to include Finance and Infrastructure as part of the key sectors for this project because they provide the opportunity to measure growth performance in Aosenuma. In deliberation with the BDD, it was concluded that the Finance and Infrastructure will be considered as “sectors of improvement” while the two strongest sectors (Oil & Gas and Mining) will serve as guiding elements. These sectors will be used to establish KPIs to measure strong performance (Mining and Oil & Gas) as well as growth performance (Infrastructure & Finance).

10. Key Performance Indicators

Current Key Performance Indicators

The Business Development Department is currently measuring seven Key Performance Indicators: # of Projects Sold, Rejection Rate, Projects worked on in the year, Sales, # of Appointments, Proposals Submitted, and # of Active Projects.

This is a fantastic place to start with KPI tracking because these various KPIs help measure essential metrics utilized in Business Development. Based on last year's operations and predicted growth of 40% (Ehrlich, 2022), the Business Development Team along with the Company Partners have already established the 2022 KPIs. The table below displays these KPIs for 2022 and operations for 2021.

| <i>KPI</i> | 2021 | 2022 |
|---------------------------------------|------------------|------------------|
| <i># Of Projects Sold</i> | 77 | 127 |
| <i>Rejection Rate</i> | 40% | 40% |
| <i>Projects worked on in the year</i> | 81 | 107 |
| <i>Sales</i> | \$45,000,000 MXN | \$65,000,000 MXN |
| <i>Sales Quoted</i> | | |
| <i># Of Appointments</i> | 95 | 150 |
| <i>Proposals Submitted</i> | 197 | 319 |
| <i># Of Active Projects</i> | 31 | 41 |
| | | |

Although these KPIs are a good starting point for KPI tracking, they are not specific enough. They lack timescale, which means that annual KPIs must be broken into monthly and quarterly KPIs. This allows the firm to track its progress and performance in meeting the annual KPIs month after month. As a result, in the next session, I will help the Business Development Team breakdown these KPIs to increase measurability.

Measurable and Specific Key Performance Indicators

The first step in developing specific KPIs is to examine previous operations and identify key measurements to serve as a foundation. In the case of the Business Development Department, this entails determining the [(number of sales per month/yearly sales) * 100], to forecast the average percent of sales per month in 2022. This monthly percentage (highlighted in yellow), combined with the 40% growth expectation of the company, is used to calculate the specific monthly KPIs for 2022. Tables 5 and 6 showcase the new proposed KPIs for 2022 KPI tracking. Table 5 shows the quarterly division of the KPIs, as well as the percentage of sales for the pre-selected sectors. Table 6 displays the same metrics but on a monthly scale. These KPIs were reviewed by the Company Partners and accepted as part of the company strategy and will be integrated further on in developing the solution.

| KPI | 2022 | Q1 | Q2 | Q3 | Q4 |
|------------------------------|----------|--------------|--------------|--------------|--------------|
| % of total Sales | 100% | 19.72% | 27.14% | 24.05% | 29.09% |
| Sales | \$65M | \$12,818,000 | \$17,641,000 | \$15,632,500 | \$18,908,500 |
| Proposals Presented # | 319 | 63 | 87 | 77 | 93 |
| Sales Quoted | \$162.5M | \$32,045,000 | \$44,102,500 | \$39,081,250 | \$47,271,250 |
| Projects Sold | 127 | 25 | 34 | 31 | 37 |
| %Sales O&G | 24% | \$3,076,320 | \$4,233,840 | \$3,751,800 | \$4,538,040 |
| % Sales Mining | 20% | \$2,563,600 | \$3,528,200 | \$3,126,500 | \$3,781,700 |
| %Sales Finance | 20% | \$2,563,600 | \$3,528,200 | \$3,126,500 | \$3,781,700 |
| %Sales Infrastructure | 15% | \$1,922,700 | \$2,646,150 | \$2,344,875 | \$2,836,275 |

Table 5 Quarterly KPIs 2022

| KPI | 2022 | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|-------------------------------|----------|-------------|--------------|--------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| % of total Sales | 100% | 1.76% | 6.36% | 11.60% | 5.75% | 14.51% | 6.88% | 10.63% | 6.95% | 6.47% | 11.20% | 9.36% | 8.53% |
| Sales | \$65M | \$1,144,000 | \$4,134,000 | \$7,540,000 | \$3,737,500 | \$9,431,500 | \$4,472,000 | \$6,909,500 | \$4,517,500 | \$4,205,500 | \$7,280,000 | \$6,084,000 | \$5,544,500 |
| Proposals Presented # | 319 | 6 | 20 | 37 | 18 | 46 | 22 | 34 | 22 | 21 | 36 | 30 | 27 |
| Sales Quoted | \$162.5M | \$2,860,000 | \$10,335,000 | \$18,850,000 | \$9,343,750 | \$23,578,750 | \$11,180,000 | \$17,273,750 | \$11,293,750 | \$10,513,750 | \$18,200,000 | \$15,210,000 | \$13,861,250 |
| Projects Sold | 127 | 2 | 8 | 15 | 7 | 18 | 9 | 14 | 9 | 8 | 14 | 12 | 11 |
| % Sales O&G | 24% | \$274,560 | \$992,160 | \$1,809,600 | \$897,000 | \$2,263,560 | \$1,073,280 | \$1,658,280 | \$1,084,200 | \$1,009,320 | \$1,747,200 | \$1,460,160 | \$1,330,680 |
| % Sales Mining | 20% | \$228,800 | \$826,800 | \$1,508,000 | \$747,500 | \$1,886,300 | \$894,400 | \$1,381,900 | \$903,500 | \$841,100 | \$1,456,000 | \$1,216,800 | \$1,108,900 |
| %Sales Finance | 20% | \$228,800 | \$826,800 | \$1,508,000 | \$747,500 | \$1,886,300 | \$894,400 | \$1,381,900 | \$903,500 | \$841,100 | \$1,456,000 | \$1,216,800 | \$1,108,900 |
| % Sales Infrastructure | 15% | \$171,600 | \$620,100 | \$1,131,000 | \$560,625 | \$1,414,725 | \$670,800 | \$1,036,425 | \$677,625 | \$630,825 | \$1,092,000 | \$912,600 | \$831,675 |

Table 6 Monthly KPIs 2022

11. Business Process

Sub-Research Question

2. What is the key and most relevant process within Business Development?

Current Business Process

Aosenuma currently has no structured or defined business processes. Interviews with the Business Development Director and Project Management Officer revealed that roles are carried out based on experience, but there are no set protocols. This means that employees and departments have a mutual knowledge of their respective tasks without any formalization. Employees learn on the-go and there are no standard procedures that new employees can use to follow.

During an interview with the BDD and PMO, I inquired whether an attempt had been made to develop and establish a Business Development Process. This attempt is depicted in Figure 8 (Hernández, 2022). The chart is in Spanish due to the company's working language; nevertheless, this is irrelevant because the figure's goal is to depict the disarray and lack of a structured Business Development Process, not to illustrate an existing one.

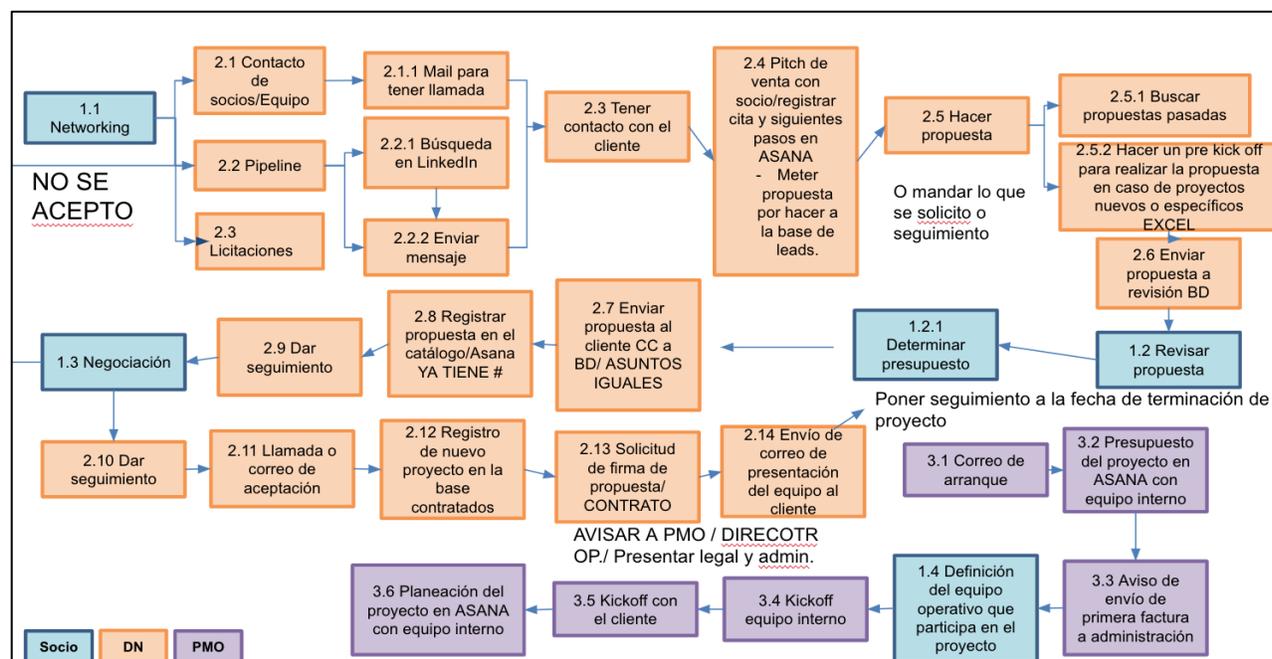


Figure 8 Past attempt in defining Business Development Process

Figure 8 shows that the flow has some basic structure but is difficult to follow. The steps are not clearly defined, and there are no designated employees for each activity. The chronological order appears to be lost, and the overlap of activities is not shown. This, combined with embedded research, leads to the conclusion that there is no defined process flow.

Proposed Business Process

As a result of discovering that Business Development lacked a defined Business Process, I set out to design one. The procedure took a few weeks as I participated in various activities and interviews to get the complete idea of what role Business Development has within Aosenuma and what are its relationships with the different departments. The BDD and PMO were involved in an iterative communication cycle with me to ensure that all steps, interactions, and overlapping activities between departments were met.

This structured and defined business procedure was submitted to the Company Partners for approval before being rolled out to the associated departments. It is now utilized and referred to for allocating responsibilities and clarifying overlapping activities. Please refer to Figure 9, showcasing the finalized proposed and accepted Business Development Process of Aosenuma.

During the course of defining the Business Development Process, I came to the following conclusions:

- The Business Development Process begins with finding possible leads and finishes with classifying closed projects.
- The Business Development Team's primary role is to find new clients, create project proposals, oversee project progress until completion, and maintain follow-up communication with the client.
- Main activities at BDT are to track monthly KPIs and ensure that the company is on track on meeting the Annual Sales KPI.
- Aosenuma partners expects BDT to take responsibility and achieve these three-year plan's sub-objectives.
 - o **Systematize the aosenuma virtual library**
 - o **Operation with a Management System**
 - o **KPI-based Reporting System**

These conclusions will be taken into consideration in the development of the final solution.

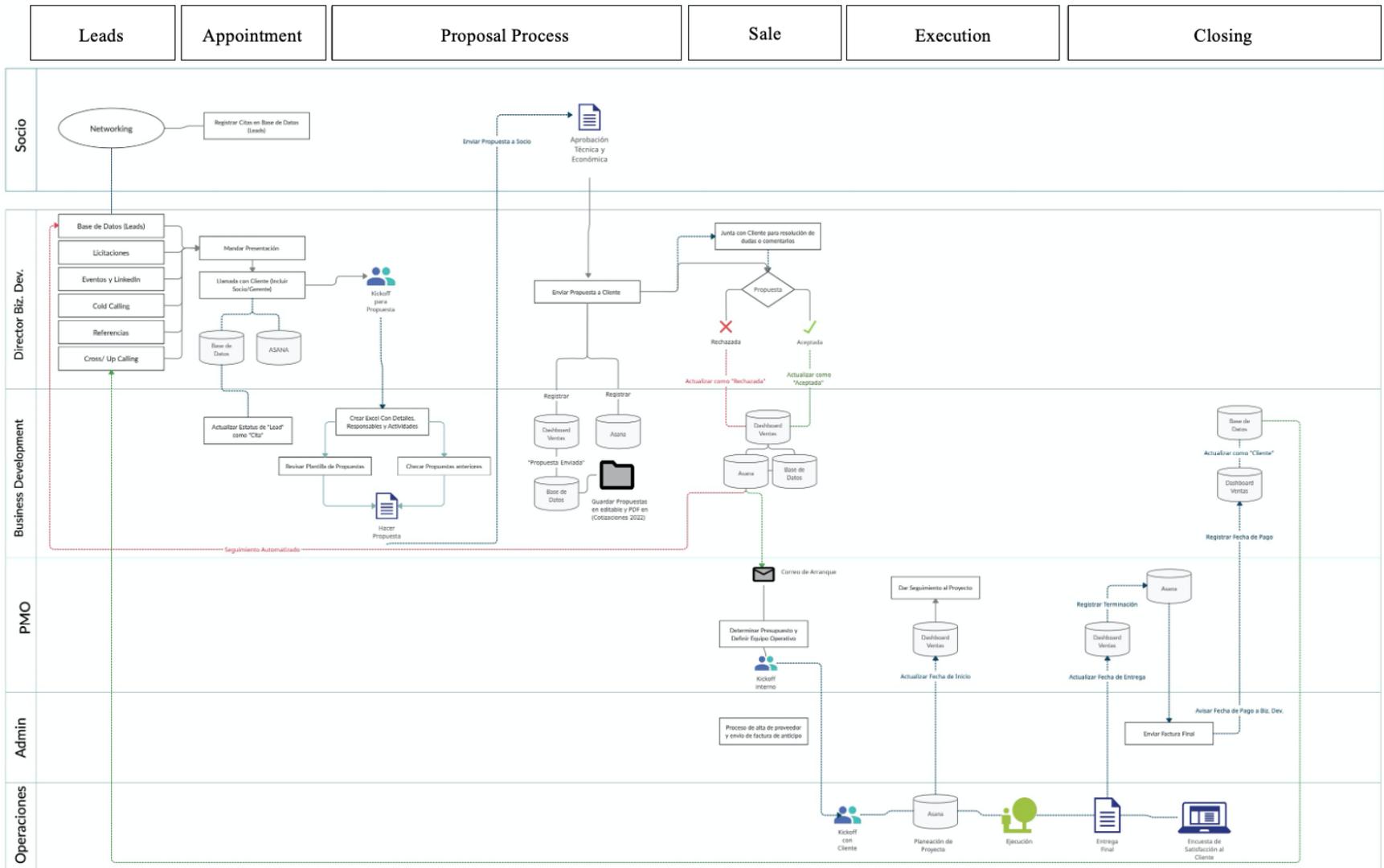


Figure 9 Proposed Business Process

12. System of Requirements

Sub-Research Question

1. What is the role of Business Development in aosenuma's three-year plan?

To acquire a comprehensive knowledge of the requirements in situ, I undertook multiple meetings with the relevant stakeholders in aosenuma. To reach a deeper degree of understanding, organized and unstructured interviews were done to allow for interaction and the flow of ideas. Notes were examined after each conversation, relevant topics were recognized, and follow-up questions for stakeholders were devised. This procedure was repeated until all parties involved had reached an agreement on the final requirements. Appendix 1 contains the questions that were addressed in these interviews; these questions have been used in past projects and have thus been tested.

A final meeting was conducted after the numerous requirements-identification interviews to examine the findings and establish a broad agreement with the Primary Stakeholders on what the final solution should provide. The final agreed-upon requirements are as follows:

Business Requirements

The main business requirement for the Business Development Department is to help Aosenuma meet its three-year plan objectives. This includes the sub-business requirements:

- Streamline the aosenuma virtual library
- Support operation with a Management System
- Develop a KPI-based Reporting System

Solution Requirements

The solution requirement in this project is increased insight into business operations and detailed KPI tracking. This requirement must be met by satisfying the follow sub-solution requirements:

Non-Functional Requirements

- Development of a Database Management System
- Provide an ongoing product, meaning that the final solution can be used and modified after the project is done
- Data Visualization should be done through an interactive Dashboard

Functional Requirements

- Offer Customer Relationship Management Functions
- Automated and visualized KPI tracking
- Solution must be able to pull and centralize data from distinct sources

Stakeholder Requirements

This project's main stakeholder requirements are that the solution provided be user-friendly and of no-cost. This means that the final solution must use systems or tools available at the company. The following sub-stakeholder requirements must be met to achieve the overlying requirement:

- Solutions must be functional and viable.
- Prioritize availability and cost reduction.
- Promote increase collaboration between stakeholders

The Business Development Department’s overarching goal is to establish **Business Data Analysis tools** to assist in meeting the objectives at various levels. The department wants to integrate the company's business processes into one system for effective and efficient data flow.

The organization requires **a system and toolset that enables for the centralization of various data types as well as automated and real-time data analysis**. Figure10 depicts Aosenuma's various requirements at different organizational levels.



Figure 10 Level of Requirements

Phase III – Solutions Development

Sub- Research Question

3. Which Business Data Analytical tools are essential in Business Development?

Phase III - Solution Development will focus on combining the study findings with the parameters, objectives, and requirements specified to investigate alternative solutions. In **Phase II- Clarification & Structuring** the major components of the project were defined and restructured to provide value to the development of a solution. The following is a breakdown of this section:

- Create a variety of possible solutions
- Evaluate the benefits and drawbacks of each option
- Select the best solution
- Describe the solution's various components.

13. Alternative Solutions

By now, I've recognized that the Business Development Department's three-year plan objectives have been immediately transferred into my work. The basic line is that the Business Development Department intends for me to construct the Data Infrastructure and Tools needed to efficiently track and meet Strategic Business Objectives. The nature of the situation is complex since the solution is meant to help Aosenuma at various levels of the organization and its outcome will determine the success of Business Development operations. In brief, converting the project's objectives into solutions means:

- Creating a Centralized Database for Business Data
- Developing Automated KPI Visualization and Tracking
- Creating a Customer Relationship Management System

Solution I – Automated Data Entry Form

The first low-cost solution investigated in the project was the creation of an Excel-based Automated Data Entry Form. Given the Business Development Department's criteria, it came to me that Excel and its specialized capabilities might be used to satisfy a variety of project requirements. Using Excel spreadsheets as a database to hold customer information, project descriptions, or other essential data is one-way Aosenuma may save time and money. Excel offers various tools that can aid with data entry automation, in this case Visual Basics for Applications (VBA). VBA is a programming language used in the Excel Software that allows the mastery of macros to create advanced modeling. By learning the programming language, I was able to create code and save macros to trigger certain fields within Excel.

The Automated Data Entry Form consists of two sections: **Data Entry** and **Database**.

Data Entry

Data Entry primarily consists of the “Launch Form,” a button I programmed within excel which launches an “Automated Data Entry Form” where stakeholders may enter information without scrolling over rows and columns and preventing accidental errors. The different data types and requirements were taken into consideration to create the data form and therefore can be used by the Business Development Department to enter key customer details and have them saved automatically in a database. Figure 11 shows the Entry Form the stakeholders see after clicking on the launch form button. As can be seen in the picture, this Automated Data Entry Form was customized to the data types of the Business Development Department, functions include:

- Entering Company and Project Details
- Using Drop-down menus to select from a pre-determined list of options
- Quickly search for any project or client in the database with a variety of possible search values
- Remove or edit an existing Project or Client

| S. No | Contract ID | Company | Client | Sector | Country | Contact Info | Submitted By | Submitted On |
|-------|-------------|---------|--------|--------|---------|--------------|--------------|--------------|
|-------|-------------|---------|--------|--------|---------|--------------|--------------|--------------|

Figure 11 Automated Data Entry Form

Database

The database is the pool of information which the Automated Data Entry Form feeds. The data entered is automatically stored and sorted according to the values. This is a key step for Business Development because an automated database can help prevent entering wrong data which can after affect analysis. Through the combination of these two aspects, data can be validated and organized as Aosenuma continues to expand its customer base.

Risks

- The VBA programming used to develop this solution is only supported in PCs. This means that to be able to use the Automated Data Entry Form, the user must utilize a Microsoft Operating System. This is not necessarily a problem; however, the Business Development Director and other company stakeholders use Apple Computers, with an operating system that does not support the Launch Form and can therefore not be used.
- The solution is not easily changeable. If the BDD seeks to modify the form and database as the company grows, an employee must know or learn the programming language to change the form. Currently there are no employees within Business Development with the adequate skills to do so.
- There is no Data Visualization aspect included within this solution, it only focuses on data entry and storage.

- This Data Entry Form does not support KPIs because it only considers two data type: Project Data and Client Data.

Opportunities

- The cleanliness of the Data Entry Form can help validate data and avoid errors in the database
- The automation feature allows stakeholders to save time by only filling in the necessary information in the form and not worrying about scrolling to input data in a big database
- Excel is a computer program used in Aosenuma and therefore the solution required no money to make

Conclusion

The Automated Data Entry Form is particularly effective in "streamlining aosenuma's virtual library," and so meets the first sub-objective of the three-year plan. However, aside from its outstanding features for data structure and validation, it lacks additional characteristics to meet other critical criteria, such as KPI tracking and visualization. If the Business Development Department merely required a database, this approach would be quite beneficial. Otherwise, I feel it is critical to investigate alternative choices.

*All the programming code created to develop this solution can be found in Appendix 2.

Solution II – Automated Database and Sales Dashboard

Due to the limitations of the last solution, the second low-cost option must rely on a free software that all Aosenuma staff is already familiar with, in this instance Google Sheets (GS). Even more than Excel, most databases and data sheets generated and shared in the company are done via this online spreadsheet tool. GS is a free web-based spreadsheet tool that can be integrated with Google Drive, Docs, and Slides to let users to exchange files, documents, and presentations online (Grubbs, 2016).. As a result, it is being employed in this solution to investigate its many capabilities and the value it may provide to the Business Development Department.

Google Sheets, like Excel, offers options akin to VBA unless you go into the advanced capabilities of VBA. Google Sheets does not support complex coding and instead relies on Query Functions, “the most powerful and versatile function in Google Sheets” (Ben Collins, 2022). Figure 12 reveals the query function I developed with data commands to manipulate large volumes of data easily. In combination with data visualization techniques, this query was leveraged to create the Sales Dashboard in Figure 13.

```
=QUERY('Database '!A1:AG,
"SELECT (AC), COUNT (P), SUM(P)
WHERE A IS NOT NULL
AND AC >= DATE ""&TEXT(E2,"YYYY-MM-DD")&""
AND AC <= DATE ""&TEXT(E3,"YYYY-MM-DD")&""
AND AD = TRUE AND AE = TRUE AND AF=TRUE
GROUP BY AC
ORDER BY AC DESC
LABEL COUNT (P) '# Projects',SUM(P) '$ Sales'"
)
```

Figure 12 Custom Query Function

* The Database cannot be shared due to the sensibility of data confidentiality. It is already in use and therefore includes Aosenuma’s historic client and project data since 2015. The Database incorporates all the data types discussed in pg. 18-19 of the report under Theoretical Framework.

Using Query Functions’ capabilities, I developed an Automated Database and Sales Dashboard.

This second solution expands on the first one offered. It has all the advantages of a centralized database system, but it also has Dashboard Capabilities and Data Visualization. Because the dashboard lacks an automated entry form, it is more prone to human error; nonetheless, data entered in the database is automatically visualized in the dashboard.

This level of data visualization has already proven to be quite beneficial in assisting managers in comprehending and extracting value from their data. Since April 2022, this solution has been adopted and the database is presently in use. The following findings can be drawn from interviews with important stakeholders who used the Database and Dashboard:

Risks

- The date filter only compares months and cannot be used to track weekly progress.
- The dashboard visualizes Sale Data but does not show specific client or project information
- The solution offers no CRM capabilities
- Only two KPIs are reflected in the Dashboard: Sales Amount and # of projects sold
- The Dashboard is limited in representing tactical and operational activities

Opportunities

- The database considers all data types relevant to Business Development Department in a centralized manner
- It is easy to use, and the function of drop-down lists help reduce human errors when entering data
- The Google Sheet can be shared with several departments simultaneously (selecting who can view and edit) respectively to their roles and positions
- The Dashboard is a good starting point on Data Visualization
- The Dashboard can be used for long-term strategic meetings

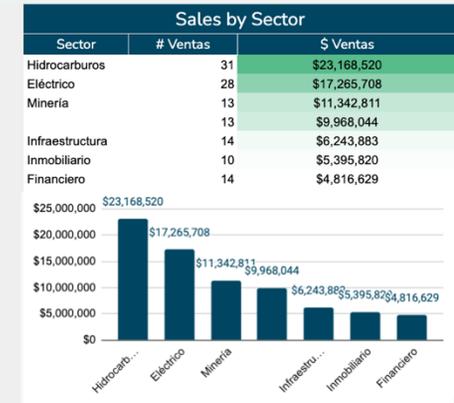
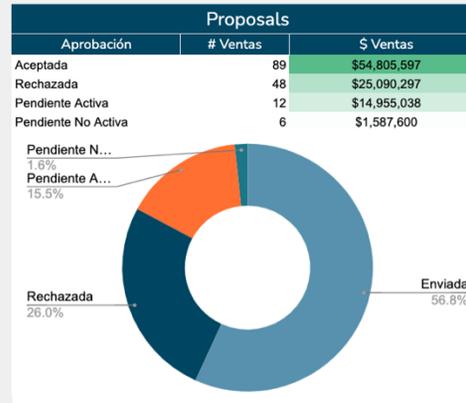
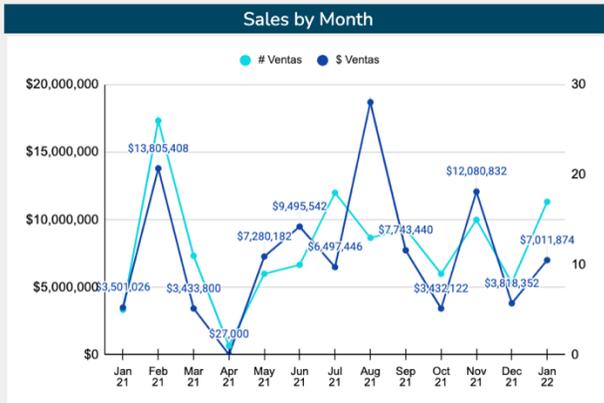
Conclusions

To summarize, option 2 is a step closer to meeting all requirements, but it is still a bit of a way off. The dashboard's early implementation led one to believe it would be a success; nevertheless, it turned out to be very constrained. It only allows stakeholders to visualize static data and has limited functionality. Because the dashboard's time scale is in months, it can only be used for monthly meetings. If weekly progress is desired, a new dashboard with weekly timescales must be developed, rendering the centralization and usefulness of the previous dashboard obsolete. On the bright side, the database was a complete success. It has been in operation for two months and a half, and it has improved the efficiency of data registration

Different data sources were combined into this one database, so stakeholders like the Business Development Director only need to open this one source to fill in all the data rather than several sheets. The time spent filling out the data cannot be measured due to the unevenness of the task; however, feedback from a meeting with the Business Development Director and Product Manager Officer indicated that their “time spent filling out and revising data was cut in half” (Ehrlich, 2022; Hernández, 2022).

| Sales | | |
|--------|------------|-------------|
| Month | # Projects | \$ Sales |
| Jan 22 | 17 | \$7,011,874 |
| Dec 21 | -53% | -46% |

| Estimated KPIs | | |
|----------------|------------|-------------|
| Month | # Projects | \$ Sales |
| Jan 22 | 7 | \$3,737,500 |
| Dec 21 | | |



| Total Sales | | | Sales (KPI) | | |
|-------------|------------|--------------|-------------|------------|--------------|
| Total | 156 | \$96,828,531 | Total | 254 | \$65,000,000 |
| Mes | # Projects | \$ Sales | 2022 | # Projects | \$ Sales |
| Jan 22 | 17 | \$7,011,874 | Q1 | 25 | \$12,818,000 |
| Dec 21 | 8 | \$3,818,352 | Enero | 2 | \$1,144,000 |
| Nov 21 | 15 | \$12,080,832 | Febrero | 8 | \$4,134,000 |
| Oct 21 | 9 | \$3,432,122 | Marzo | 15 | \$7,540,000 |
| Sep 21 | 14 | \$7,743,440 | Q2 | 34 | \$17,641,000 |
| Aug 21 | 13 | \$18,701,507 | Abril | 7 | \$3,737,500 |
| Jul 21 | 18 | \$6,497,446 | Mayo | 18 | \$9,431,500 |
| Jun 21 | 10 | \$9,495,542 | Junio | 9 | \$4,472,000 |
| May 21 | 9 | \$7,280,182 | Q3 | 31 | \$15,632,500 |
| Apr 21 | 1 | \$27,000 | Julio | 14 | \$6,909,500 |
| Mar 21 | 11 | \$3,433,800 | Agosto | 9 | \$4,517,500 |
| Feb 21 | 26 | \$13,805,408 | Septiembre | 8 | \$4,205,500 |
| Jan 21 | 5 | \$3,501,026 | Q4 | 37 | \$18,908,500 |
| | | | Octubre | 14 | \$7,280,000 |
| | | | Noviembre | 12 | \$6,084,000 |
| | | | Diciembre | 11 | \$5,544,500 |

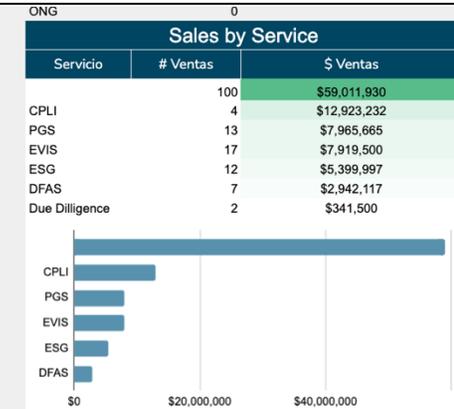
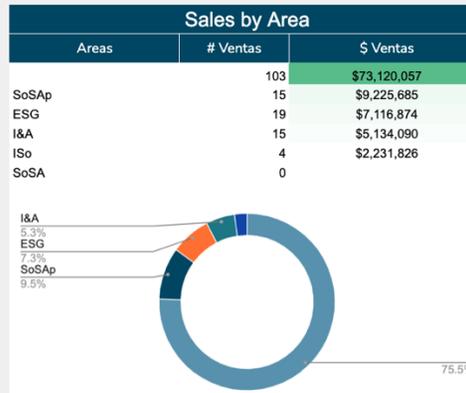


Figure 13 Automated Database and Sales Dashboard

Solution III – Data Studio

The third and final solution aims to expand on the two prior trials to meet all the previously listed requirements. The focus was to employ a system that was freely available to the company and could connect departments and data types, similar to the Google Sheets Database, but with more robust Dashboard capabilities.

This solution was difficult to discover because Business Development Department and Aosenuma stakeholders stated unequivocally that they did not want to adapt a new software application that would replace the Google Docs platform already in use. This appeared difficult to find at first during the desk research, until I discovered Google Data Studio.

Data Studio is a free online platform that turns data into informative, easy to read, easy to share, and fully customizable dashboards and reports (Google , 2022). It has the capability of blending data from a variety of sources and is directly compatible with Google Sheets (Data Sources of Aosenuma). It has high data visualization capabilities due to its high number of charts offered; in addition, it makes use of data filters to make reports more dynamic.

Due to its compatibility with Google Sheets, there was no need in creating another Database. The created Database in Google Sheets has already proved to be a valuable solution to the Business Development Team and is therefore the data source used to develop the Dashboards in Data Studio.

To fulfill all the business requirements, I created two dashboards within Data Studio. The first (Figure 14) focuses on Customer Relationship Management and Business Development Metrics, and the second (Figure 15) on KPI Tracking.

Strategically, this solution helps 1) foster data-driven decision making with the Business Development Team. Due to the high level of accuracy of the data and analysis, choices can be taken swiftly and justified using the dashboards created. The charts immediately reflect the patterns and reality of the data; therefore, managers can use the graphs as justifications to 2) revise or adjust strategic plans and track growth in the future.

At a tactical level, these dashboards depict the business data required 1) to measure progress on monthly and quarterly KPIs, and 2) to provide strategic insights that Company partners may utilize to make crucial decisions. For example, the Sector Breakdown shows which sectors earn what amount of revenue and how many projects were sold. This study is like the one used to establish aosenuma's primary sectors of operation on page 25.

Finally, this solution satisfies operational requirements because the 1) graphs in the dashboards visualize valuable data that can be used to gain insight into operations. 2) The data filter added on the top right can filter the data specific to any the day or any date range, making it useful for weekly reports. Thirdly, the centralization of various data types and sources, refer to Appendix 2, 3) keeps stakeholders from having to traverse back and forth through data sheets to perform analysis. All these analyses are performed automatically in a single location, therefore there is no need to have several internet sites open.

In conclusion, this solution it was able to visualize all the required data types for the Business Development Department and give a mechanism for incorporating data into company decision-making. In **Phase IV - Implementation and Control**, the efficacy and alignment to the specified business objectives will be examined.

Risks

- Data Studio's modularity options can encourage Scope Creep from stakeholders after deployment.
- Having to access the dashboard from a different page than Google Sheets can limit the benefits of Data Centralization.

Opportunities

- The dashboard requires no programming (drag-and-drop) making it user-friendly and easy to teach stakeholders how to interact with it
- It contains a wide range of Data Visualization features, which expands the options for visualizing crucial data.
- It is a free application.
- Various data sources can be combined and centralized to create insightful charts.

Conclusions

To summarize, Data Studio is an excellent Business Data Analysis tool that highlights the value of data. It offers data in an easy-to-understand and accessible format, and its real-time features enable stakeholders to access it at any time of day, on any day of the year. It can be used to compare significant periods like quarters, months, and years, as well as single days, weeks, and terms.

Its most valuable feature, aside from its excellent data visualization capabilities, is the connectivity to Google Sheets. Since the tool completely corresponds with aosenuma processes, data structures do not need to be changed to accommodate the Data Studio.

The solution's main risk is stakeholder approval. Data Studio is a new and powerful tool that may discourage stakeholders from taking the time to learn and use it. Since the Business Development team is not technologically savvy, it is possible that no employee would want to oversee the operations and maintenance of the tool after the project is over.

If this tool is chosen as the final solution, employee training must be provided, as well as a key stakeholder appointed to operate and utilize the tool. The objective is that the tool be employed continuously in the decision-making process rather than only once.



Date and Sector Filters

Market Penetration

Project Management

Sales Tracking

Sector Breakdown

Figure 14 CRM Dashboard

Cumulative
KPI Tracking



Annual &
Quarterly
Progress



KPI Targets



Progress vs.
Last Year

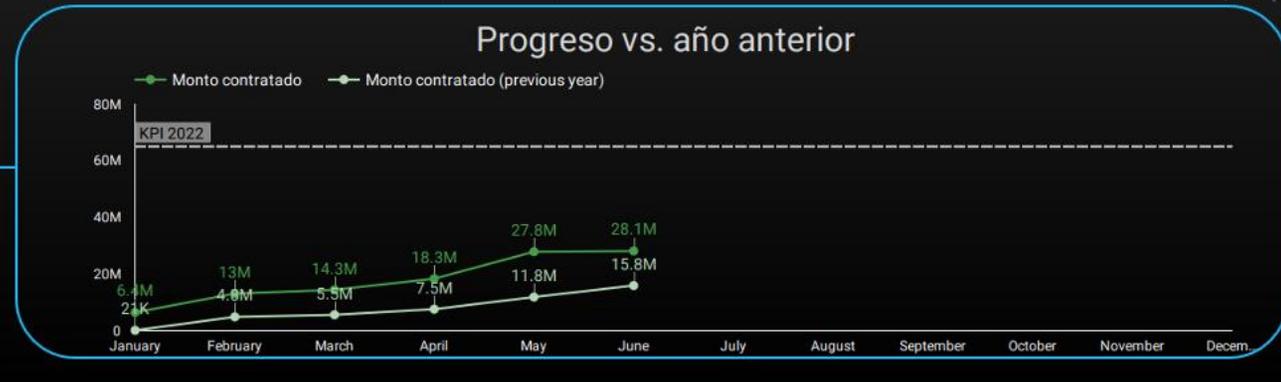


Figure 15 KPI Dashboard

14. Selection Analysis

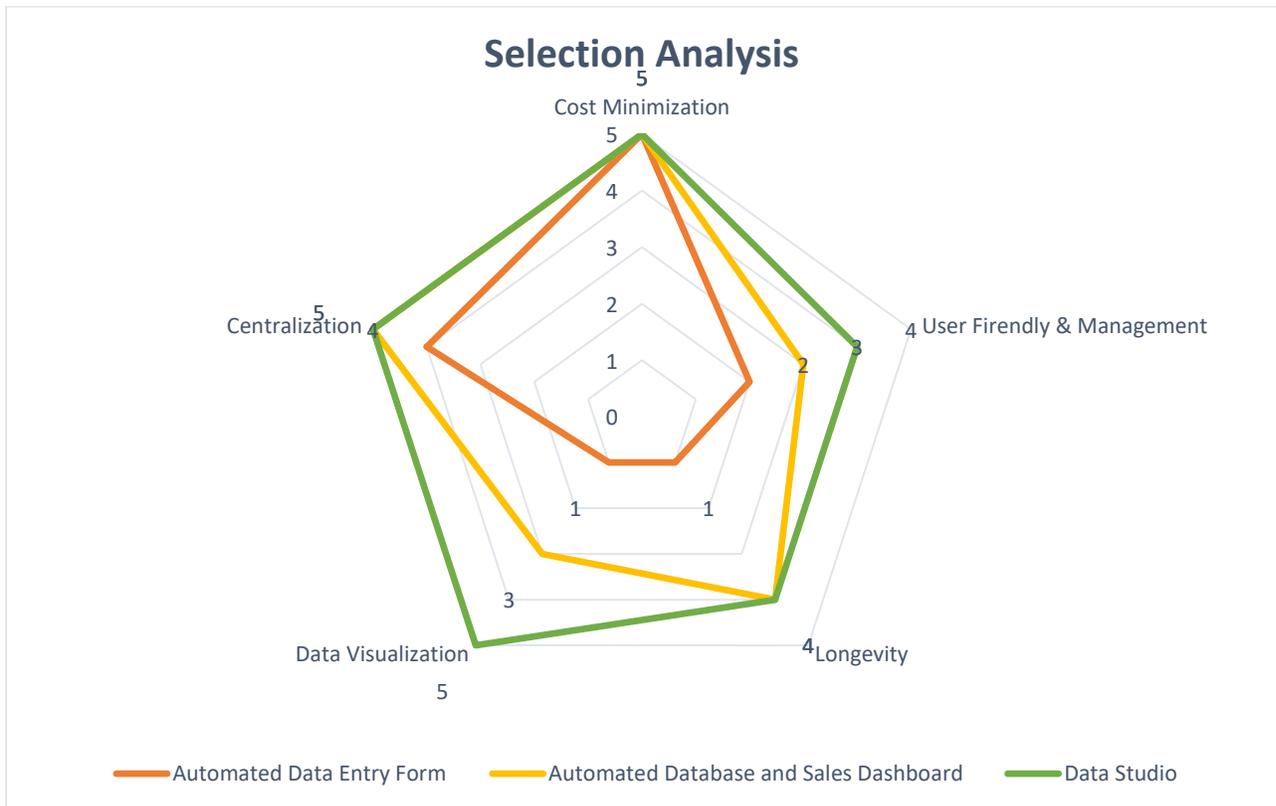
Sub-Research Question

5. What are some other considerations to make throughout the Business Process Improvement?

The general solutions, as well as their potential risks and opportunities, were discussed in the previous section. To make the final decision, this part will assess and decide how each solution contributes to satisfying the project requirements.

These solutions are rated and contrasted on a 1-5 scale, with 1 being low (unsatisfactory), 2 being satisfied, 3 being adequate, 4 being good, and 5 being excellent (Highly satisfactory). The following major requirements are being considered:

- **Cost Minimization:** The tool must be free
- **User-Friendly & Management:** Can the tool quickly be adapted and used by the Business Development Team? Does it allow for easy management of operations?
- **Longevity:** Can the tool continue to be used and expanded upon after the termination of the project?
- **Data Visualization:** How capable are the Data Visualization capabilities?
- **Centralization:** Does the tool centralize data sources into a single database?



The greater the total score, the better a major requirement is incorporated in the solution. The points were put together to get a cumulative total, and the best solution was determined by the highest score. This technique was carried out to eliminate as much prejudice as possible and to provide a quantitative approach to decision making.

There is still some researcher bias, but it's difficult to rule out because I was involved in all phases of the project's development. Nonetheless, to achieve a more balanced perspective, the scores were decided in collaboration with the Product Manager Officer and Business Development Director.

| Requirement | Automated Data Entry Form | Automated Database and Sales Dashboard | Data Studio |
|----------------------------|---------------------------|--|-------------|
| Cost Minimization | 5 | 5 | 5 |
| User Friendly & Management | 2 | 3 | 4 |
| Longevity | 1 | 4 | 4 |
| Data Visualization | 1 | 3 | 5 |
| Centralization | 4 | 5 | 5 |
| Total | 13 | 20 | 23 |

The solution with the highest cumulative score is: **Data Studio.**

Phase IV – Implementation & Control

15. Business Case

The business case explains why the project solution is started. In the previous section, I discussed some fundamental Data Studio functions in relation to various solution requirements; in this business case, I will revisit the business objectives stated at the beginning of the report and link them to the solution. This way, I can ensure that the various components of the solution meet both the requirements and strategic objectives of Aosenuma.

Due to the context of the project, this business case is grounded on non-financial benefits. As a reference point, I'll use the three sub-objectives assigned to the Business Development Department in Aosenuma's three-year plan, and thus to this project:

1) Streamline Aosenuma's Virtual Library

As stated, before in the report, the term "virtual library" in Aosenuma is used to describe the company's clients and projects library. To streamline this library suggests making the system that encompasses the library more efficient and effective by employing optimized working methods. By developing a structured Business Development Process and modernizing the technology and technique used to store and manage this data, the solution eliminates unnecessary work-related tasks.

The database contains all the required data types, and its chronological organization allows stakeholders to easily input and find data. The defined columns in the database (Data types) and use of drop-down lists structure the data inputting process, making it simple to understand. The solution's development allowed for the creation of an Input-Throughput-Output process. This process and its relevant components demonstrate the streamlined flow of Aosenuma's Virtual library, beginning with raw data (Input) and transitioning to data management and validation (throughput) and finally using key information to make data-driven decisions. Figure 16 depicts this process.

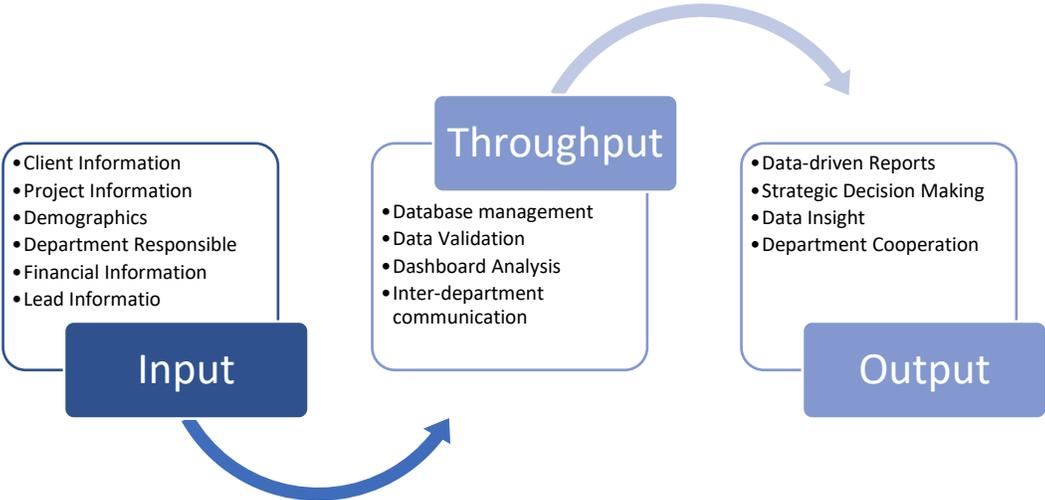


Figure 16 Streamlined Visual Library

By satisfying this sub-objective, the Business Development Department now has the data infrastructure and processes in place to contribute to the Three-year plan objective of “Systemizing [their] Performance” (Aosenuma, 2022). According to the Business Development Director, Project Manager Officer, and Company Partners this new streamlined process has already “proven to align expectations and optimize department data sharing and communication” (Hernández, 2022) (Ehrlich, 2022).

2) Operation with a Management System

This objective employs the same tools as the previous one, but they are measuring two distinct aspects. The first objective focuses on the information and communication process behind the database. This objective, on the other hand, focuses on the database's specific parameters and functions. This means that in this business objective, Aosenuma seeks to use the functionality required to delegate tasks and ensure that all variables are considered and used during the Business Development Process. Because of the dashboard's structure, this was accomplished through the solution. As previously stated, the database included all the necessary Data types used by Business Development and other departments.

Even though the database cannot be shared due to data confidentiality, table 7 depicts the various columns used in order. The column titles were transposed into rows due to formatting limitations in the word document. The order of these columns and rows is critical: the data in the database is ordered left to right according to the streamlined process described above. The key dates tracked through project management are on the left, followed by key client and project information, financial data, and finally follow-up and extra notes. Clients and projects are listed in chronological order from top to bottom. The oldest projects are at the top, and the newest are at the bottom. Clients are ordered by client #s, so their projects are centralized and easily found by client company name.

After implementation, the Business Development Department has begun to operate with a management system. This database was created with the intention of being used by multiple departments, and after two and a half months of use, it has been adopted as the management system. Because multiple departments use this tool to centralize their overlapping data, each department's progress can be tracked by all stakeholders, promoting accountability and a supportive network of activities. The implementation of this tool is the first step in “Consolidating corporate governance” as part of Aosenuma’s three-year plan (Aosenuma, 2022).

| Column Metric | Responsible Department |
|---|------------------------|
| <i>Sent Date</i> | Business Development |
| <i>Approval Date</i> | Business Development |
| <i>Starting Date</i> | Operations |
| <i>Submission Date</i> | Operations |
| <i>Payment Date</i> | Administration |
| <i>Client</i> | Business Development |
| <i>Company</i> | Business Development |
| <i>Business Name</i> | Administration |
| <i>Country</i> | Business Development |
| <i>State</i> | Business Development |
| <i>Municipality</i> | Business Development |
| <i>Sector</i> | Business Development |
| <i>Contact Information</i> | Business Development |
| <i>Department</i> | Business Development |
| <i>Amount Quoted</i> | Business Development |
| <i>Sale Amount</i> | Business Development |
| <i>Parties Involved</i> | Operations |
| <i>Invoice Company</i> | Administration |
| <i>Service Offered</i> | Business Development |
| <i>Product Offered</i> | Business Development |
| <i>Approval Status</i> | Business Development |
| <i>Probability of Acceptance</i> | Business Development |
| <i>Probability of Starting</i> | Operations |
| <i>Signed Contract (Yes/No)</i> | Administration |
| <i>Status (Approved, Pending, Rejected)</i> | Business Development |
| <i>Lead Source</i> | Business Development |

Table 7 Database Column Metrics and Responsible Department

*The colors allocated to each department and column header are the same ones used in the management system.

KPI-based Reporting System

The development of a KPI-Based Measurement tool is another significant sub-goal of Aosenuma's three-year strategy. This sub-objective is also part of Consolidating corporate governance's main goal.

The organization and analysis of the most essential company key performance indicators was made easier through the design and implementation of the KPI reporting tool. KPIs may now be tracked in real time by the Business Development Department, and these analytics can be used to make strategic decisions by company partners. It contributes to the long-term consolidation of corporate governance by adding a quantitative aspect of performance. Departments and the organization can use descriptive and accurate indicators to assess their growth success. Setting baselines and measuring their progress in respect to previous data will be critical as Aosenuma continues to grow significantly in the future years. On top of that, the KPIs have been meticulously established, and the solution's sophisticated visualization capabilities enable a quick and comprehensive examination.

These KPIs can also be used by Aosenuma to establish its market position and entice potential clients by giving corporate performance reports with measurable indicators.

Financial Benefits

The solution is free, which is the most significant financial gain for aosenuma. This powerful tool can be used by the Business Development Department without having to spend any money. Although this conclusion is simple and straightforward, I attempted to correlate the Department's progress on meeting financial KPIs before and after the tool's implementation to gain a better understanding of its impact. Figure 17 shows the sales KPI in contrast to actual sales for each month of 2022 so far. The percent difference line shows how much of the KPI was achieved by the company in that month.

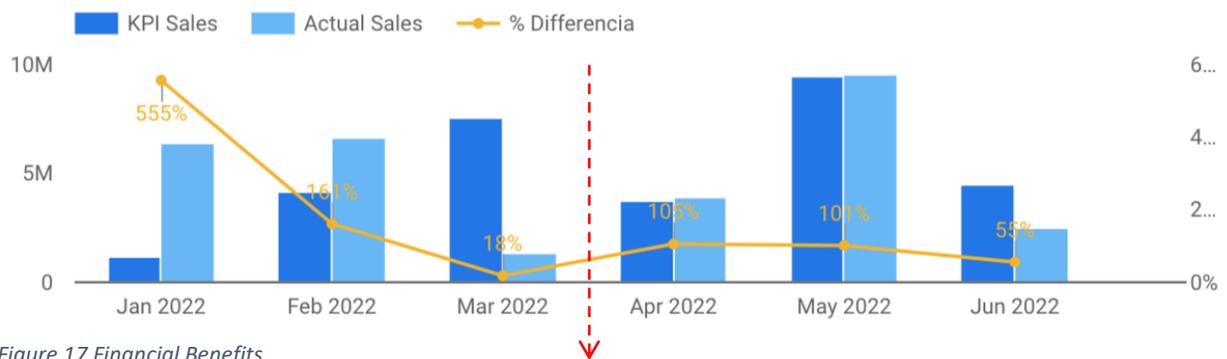


Figure 17 Financial Benefits

Implementation Date (April 1, 2022)

This figure's analysis is really fascinating. The first two months (January and February) have high accomplishment rates since most projects sold during those months come from proposals submitted late in 2021. March is the first true figure demonstrating how Aosenuma operated without tracking their monthly sales KPI success. Starting in April, the company displays more stability and less variation in fulfilling its sales KPI, with a 106 percent success rate in April and a 101 percent success rate in May. So far in the first week of June, the company has achieved more than 55% of its target and is on track to achieve similar results as in April and May.

Remarks

It's worth noting that when I started at the company, another person joined me; he was the former Business Development Director. The first two months reflect past operations, but March reflects his exploits. Due to the lack of a structured business process and KPI tracking in the past, this former colleague had difficulty tracking the company's growth and targeting underperforming areas.

Considering he was unable to track important data, it was unclear whether the KPIs were being met throughout the month. After implementing the KPI tool and formal business process, the former Director was able to gain a better understanding of the operations and manage them properly.

Due to the abundance of variables, it is misleading to conclude that there is a direct correlation between the tool and the success of meeting financial KPIs; however, both the PMO and current BDD believe that "the current performance success is greatly due to the KPI-based reporting system implementation" (Ehrlich, 2022) (Hernández, 2022).

16. Information & Knowledge Transfer

I conducted three employee training sessions (1.5 hours each) to ensure information transfer and the continuation of the tools implemented after my departure. Prior to these sessions, the key stakeholders agreed that the Project Management Officer would oversee the management of these tools.

The first two sessions were intended to educate the PMO on the database and dashboards. I taught her the ins and outs of the tool, including how to extract data sources, relevant metrics, and the various coding and maintenance tasks required to keep it running. The last session was more of an examination in which I asked her to create certain solutions from scratch and guided her through the process.

She was able to create databases and dashboards from scratch by the end of the training sessions and felt "happy and confident in acquiring the new tech skills" (Hernández, 2022). It was agreed that if a technical failure occurred in the future, the company could contact me for solution advice. I am confident that, with the PMO in charge, the tool will be used and developed in tandem with the company.

The training sessions were organized as follows:

- *Training Session #1 (June 6, 2022)*
 - o Database Introduction
 - o Query Function
 - o Structuring different Data Types
 - o Managing different department information
 - o Creating the Google Sheets Dashboard
 - o Stakeholder Management
- *Training Session #2 (June 7, 2022)*
 - o Introduction to Google Data Studio
 - o Implementing Data Sources from Google Sheets
 - o Blending Data Sources
 - o Defining key Metrics and Dimensions
 - o Creating Interactive Charts
 - o Implementing the Data-Range Filter
 - o Creating Data Blended Charts
 - o Automatic export and sharing of report with key Stakeholders
- *Examination Session (June 9, 2022)*
 - o Replicate the Google Sheets Database
 - Consider all departments and data types
 - o Implement database into Data Google Studio
 - o Define Key Metrics and Dimensions
 - o Create a basic scorecard to show total sales
 - o Develop the Sector Breakdown graphic
 - o Create the KPI and Sales tracking graph
 - o Extract and share the report via email

17. Conclusion

Having diverse data cultures has been a challenge for aosenuma in recent months, including combining systems and databases. This problem was solved not only by centralizing all Business Development Data and processes, but also by designing a dynamic and adaptable system that can expand with the firm. I am convinced that as the company's operations continue to evolve in the coming years, the solutions developed will be highly beneficial.

Implementing the Business Data Analysis tools will assist the company in meeting their three-year plan objectives and help solve from the company's recent merger problems. The incorporation of the three-year plan sub-objectives as a project guide and success factors allowed for the development of a dynamic and precise solution. My advice is for the organization to keep setting strategic goals based on data-driven decisions and modify the current solution to keep up with their growth.

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Appendix 1

Sectors Aosenuma Operates in:

| |
|------------------|
| - Mining |
| - Oil & Gas |
| - Startup |
| - Financial |
| - Infrastructure |
| - Electric |
| - Real estate |
| - Agriculture |
| - NGO |
| - Marketing |
| - Agroindustry |
| - Metals |
| - Fintech |
| - Consumption |
| - Other |
| - Insurance |
| - Industrial |
| - Telecom |
| - Hotelier |
| - Biz. Dev |
| - Legal |
| - Government |
| - ESG |

Table 8 Aosenuma Sectors of Operation

Requirements-Identification Interview Questions

Initial Information Questions

- What is the business strategy?
- What are the main processes followed in the company?
- Where does the process start?
- What are the most common customer complaints?
- Were there follow ups to the root-cause of the problem?
- What business objective am I trying to solve?
- Is there research to back up problems?

General Requirement Questions

- What part of the organization is the project targeting? (Relevant stakeholders)
- Where does the process begin?
- Who will be taking part of the process?
- How will the process meet the business need?
- Where can the results be visible?
- When does the organization need to receive information?
- What will be the inputs to the process?
- What will be the outputs of the process?
- What needs to be tracked?
- What will be the result?
- Why will a new process add value to the organization?

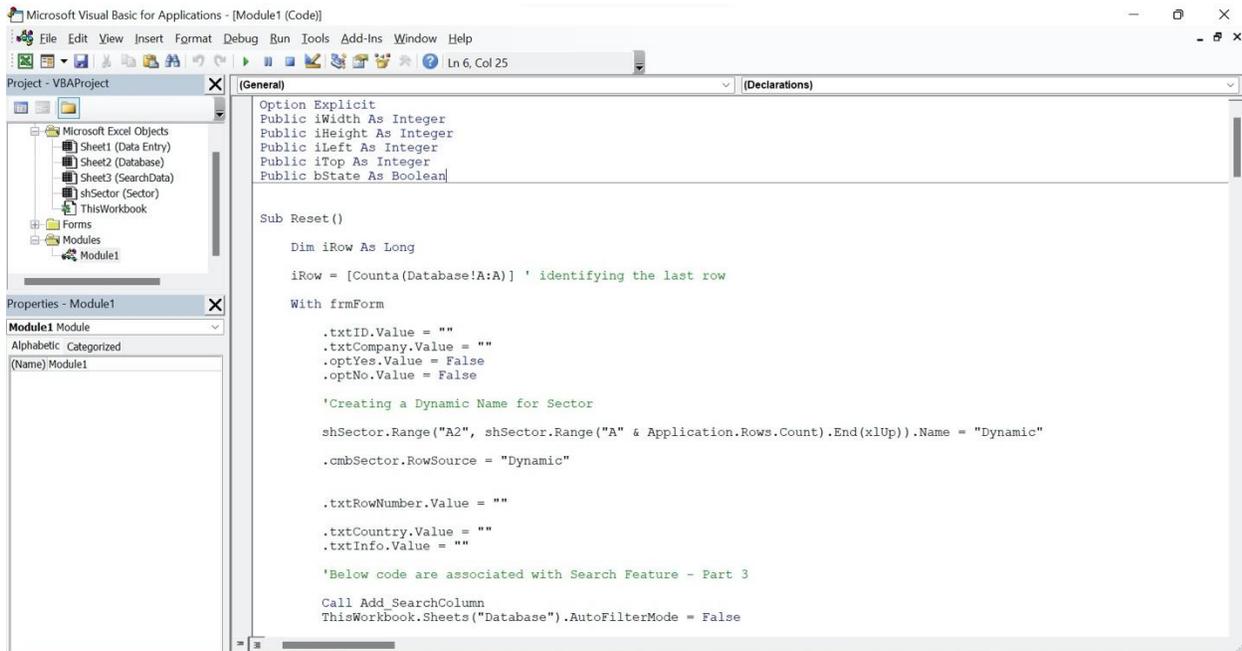
Further Detailed Requirement Questions

- What is the overall benefit for the business?
- What is required from the process?
- Must the new process adapt to the existing processes?
- What is the process required to do?
- How is the process supposed to function?
- What platform is available to adapt new process?
- How will the process satisfy customers?
- Where does the new process add value?
- What internal stakeholders will be the most impacted by the process?
- Is there infrastructure in place to adapt new process?
- How much energy is the company willing to put in to adapt process?
- Are there any restrictions to the process?
- What limitations are in place for implementing the new process?

(Dubson, 2020)

Appendix 2

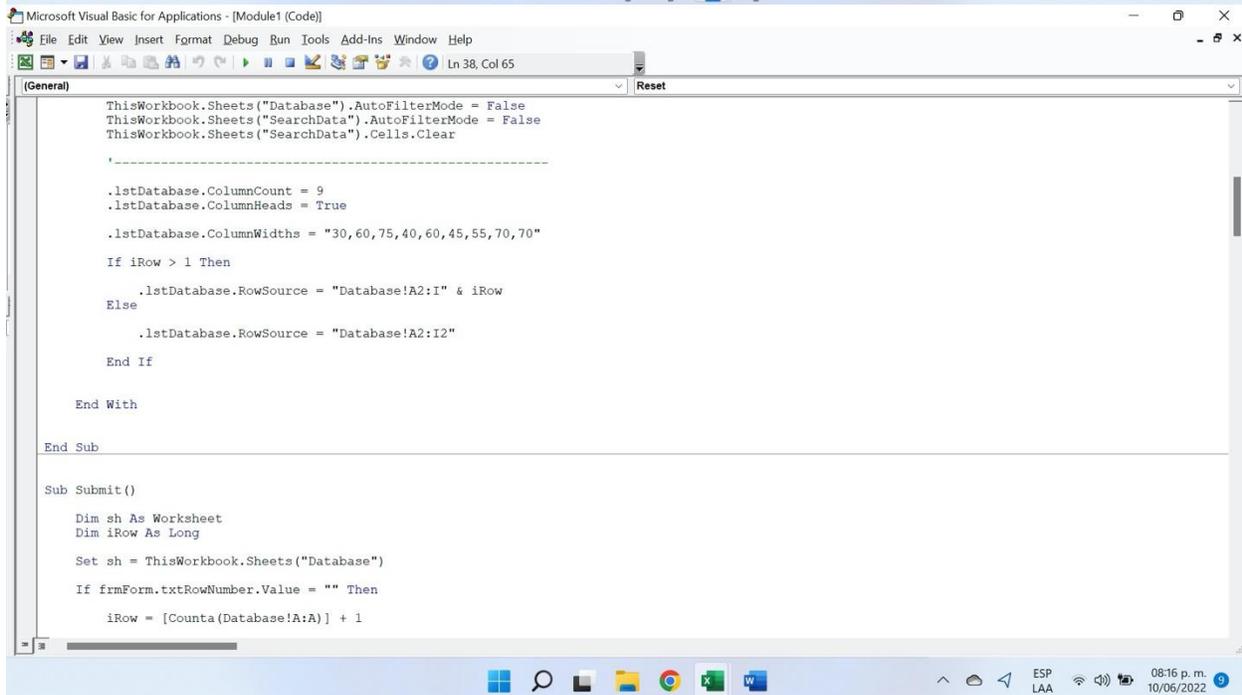
VBA Programming Code for Automated Data Entry



```
Microsoft Visual Basic for Applications - [Module1 (Code)]
File Edit View Insert Format Debug Run Tools Add-Ins Window Help
Project - VBAProject
Microsoft Excel Objects
  sheet1 (Data Entry)
  sheet2 (Database)
  sheet3 (SearchData)
  shSector (Sector)
  ThisWorkbook
Forms
Modules
  Module1
Properties - Module1
Module1 Module
Alphabetic Categorized
(Name) Module1

(General) (Declarations)
Option Explicit
Public iWidth As Integer
Public iHeight As Integer
Public iLeft As Integer
Public iTop As Integer
Public bState As Boolean

Sub Reset ()
    Dim iRow As Long
    iRow = [Counta(Database!A:A)] ' identifying the last row
    With frmForm
        .txtID.Value = ""
        .txtCompany.Value = ""
        .optYes.Value = False
        .optNo.Value = False
        'Creating a Dynamic Name for Sector
        shSector.Range("A2", shSector.Range("A" & Application.Rows.Count).End(xlUp)).Name = "Dynamic"
        .cmbSector.RowSource = "Dynamic"
        .txtRowNumber.Value = ""
        .txtCountry.Value = ""
        .txtInfo.Value = ""
        'Below code are associated with Search Feature - Part 3
        Call Add_SearchColumn
        ThisWorkbook.Sheets("Database").AutoFilterMode = False
    End With
End Sub
```



```
Microsoft Visual Basic for Applications - [Module1 (Code)]
File Edit View Insert Format Debug Run Tools Add-Ins Window Help
Project - VBAProject
Microsoft Excel Objects
  sheet1 (Data Entry)
  sheet2 (Database)
  sheet3 (SearchData)
  shSector (Sector)
  ThisWorkbook
Forms
Modules
  Module1
Properties - Module1
Module1 Module
Alphabetic Categorized
(Name) Module1

(General) (Reset)
ThisWorkbook.Sheets("Database").AutoFilterMode = False
ThisWorkbook.Sheets("SearchData").AutoFilterMode = False
ThisWorkbook.Sheets("SearchData").Cells.Clear

'-----
.lstDatabase.ColumnCount = 9
.lstDatabase.ColumnHeads = True
.lstDatabase.ColumnWidths = "30,60,75,40,60,45,55,70,70"
If iRow > 1 Then
    .lstDatabase.RowSource = "Database!A2:I" & iRow
Else
    .lstDatabase.RowSource = "Database!A2:I2"
End If
End With
End Sub

Sub Submit ()
    Dim sh As Worksheet
    Dim iRow As Long
    Set sh = ThisWorkbook.Sheets("Database")
    If frmForm.txtRowNumber.Value = "" Then
        iRow = [Counta(Database!A:A)] + 1
    End If
End Sub
```

```
Microsoft Visual Basic for Applications - [Module1 (Code)]
File Edit View Insert Format Debug Run Tools Add-Ins Window Help
Ln 38, Col 65

(General) Reset

End If

With sh
    .Cells(iRow, 1) = iRow - 1
    .Cells(iRow, 2) = frmForm.txtID.Value
    .Cells(iRow, 3) = frmForm.txtCompany.Value
    .Cells(iRow, 4) = IIf(frmForm.optNo.Value = True, "No", "Yes")
    .Cells(iRow, 5) = frmForm.cmbSector.Value
    .Cells(iRow, 6) = frmForm.txtCountry.Value
    .Cells(iRow, 7) = frmForm.txtInfo.Value
    .Cells(iRow, 8) = Application.UserName
    .Cells(iRow, 9) = [Text(Now(), "DD-MM-YYYY")]
End With

End Sub

Sub show_form()
    frmForm.Show
End Sub
```

```
Microsoft Visual Basic for Applications - [Module1 (Code)]
File Edit View Insert Format Debug Run Tools Add-Ins Window Help
Ln 38, Col 65

(General) Reset

Function Selected_List() As Long
    Dim i As Long
    Selected_List = 0
    For i = 0 To frmForm.lstDatabase.ListCount - 1
        If frmForm.lstDatabase.Selected(i) = True Then
            Selected_List = i + 1
            Exit For
        End If
    Next i
End Function

Sub Add_SearchColumn()
    frmForm.EnableEvents = False
    With frmForm.cmbSearchColumn
        .Clear
        .AddItem "All"
        .AddItem "Contract ID"
        .AddItem "Company"
        .AddItem "Client"
        .AddItem "Sector"
        .AddItem "Country"
    End With
End Sub
```

```
Microsoft Visual Basic for Applications - [Module1 (Code)]
File Edit View Insert Format Debug Run Tools Add-Ins Window Help
Ln 151, Col 3
Add_SearchColumn

.AddItem "Contact Info"
.AddItem "Submitted By"
.AddItem "Submitted On"

.Value = "All"

End With

frmForm.EnableEvents = True

frmForm.txtSearch.Value = ""
frmForm.txtSearch.Enabled = False
frmForm.cmdSearch.Enabled = False

End Sub

Sub SearchData ()
    Application.ScreenUpdating = False
    Dim shDatabase As Worksheet ' Database Sheet
    Dim shSearchData As Worksheet 'SearchData Sheet

    Dim iColumn As Integer 'To hold the selected column number in Database Sheet
    Dim iDatabaseRow As Long 'To store the last non-blank row number available in Database Sheet
    Dim iSearchRow As Long 'To hold the last non-blank row number available in SearchData Sheet

    Dim sColumn As String 'To store the column selection
    Dim sValue As String 'To hold the search text value

    Set shDatabase = ThisWorkbook.Sheets("Database")
    Set shSearchData = ThisWorkbook.Sheets("SearchData")
```

```
Microsoft Visual Basic for Applications - [Module1 (Code)]
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Add_SearchColumn

iDatabaseRow = ThisWorkbook.Sheets("Database").Range("A" & Application.Rows.Count).End(xlUp).Row

sColumn = frmForm.cmbSearchColumn.Value
sValue = frmForm.txtSearch.Value

iColumn = Application.WorksheetFunction.Match(sColumn, shDatabase.Range("A1:I1"), 0)
'Remove filter from Database Worksheet
If shDatabase.FilterMode = True Then
    shDatabase.AutoFilterMode = False
End If
'Apply filter on Database worksheet
If frmForm.cmbSearchColumn.Value = "Contract ID" Then
    shDatabase.Range("A1:I" & iDatabaseRow).AutoFilter Field:=iColumn, Criteria:=sValue
Else
    shDatabase.Range("A1:I" & iDatabaseRow).AutoFilter Field:=iColumn, Criteria:="" & sValue & ""
End If
If Application.WorksheetFunction.Subtotal(3, shDatabase.Range("C:C")) >= 2 Then
    'Code to remove the previous data from SearchData Worksheet
    shSearchData.Cells.Clear
```

```
Microsoft Visual Basic for Applications - [Module1 (Code)]
File Edit View Insert Format Debug Run Tools Add-Ins Window Help
Ln 151, Col 3
(General) Add_SearchColumn

shDatabase.AutoFilter.Range.Copy shSearchData.Range("A1")
Application.CutCopyMode = False
iSearchRow = shSearchData.Range("A" & Application.Rows.Count).End(xlUp).Row
frmForm.lstDatabase.ColumnCount = 9
frmForm.lstDatabase.ColumnWidths = "30, 60, 75, 40, 60, 45, 55, 70, 70"
If iSearchRow > 1 Then
    frmForm.lstDatabase.RowSource = "SearchData!A2:I" & iSearchRow
    MsgBox "Records found."
End If

Else
    MsgBox "No record found."
End If

shDatabase.AutoFilterMode = False
Application.ScreenUpdating = True

End Sub

Sub Maximize_Restore()
    If Not bState = True Then
        iWidth = frmForm.Width

```

```
Microsoft Visual Basic for Applications - [Module1 (Code)]
File Edit View Insert Format Debug Run Tools Add-Ins Window Help
Ln 151, Col 3
(General) Add_SearchColumn

iHeight = frmForm.Height
iTop = frmForm.Top
iLeft = frmForm.Left
'Code for Full Screen
With Application
    .WindowState = xlMaximized
    frmForm.Zoom = Int(.Width / frmForm.Width * 100)
    frmForm.StartUpPosition = 0
    frmForm.Left = .Left
    frmForm.Top = .Top
    frmForm.Width = .Width
    frmForm.Height = .Height
End With
frmForm.cmdFullScreen.Caption = "Restore"
bState = True

Else
    With Application
        .WindowState = xlNormal
        frmForm.Zoom = 100
        frmForm.StartUpPosition = 0
        frmForm.Left = iLeft
        frmForm.Width = iWidth
        frmForm.Height = iHeight
        frmForm.Top = iTop
    End With
    frmForm.cmdFullScreen.Caption = "Full Screen"

```

```
bState = False

End If

End Sub
```

Data Blending for Data Studio Charts

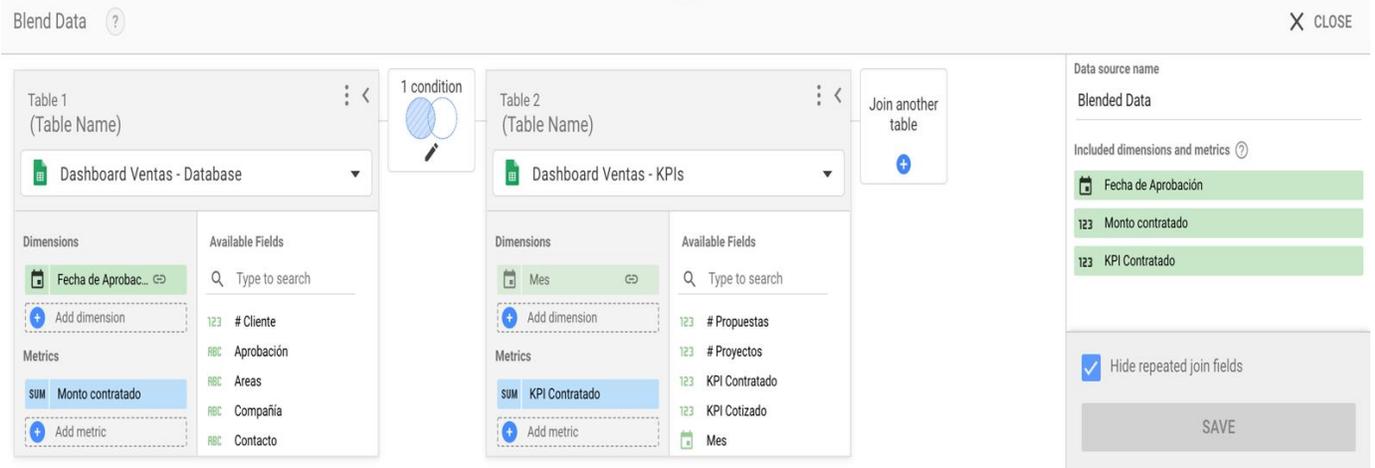


Figure 18 Blending Data in Google Data Studio

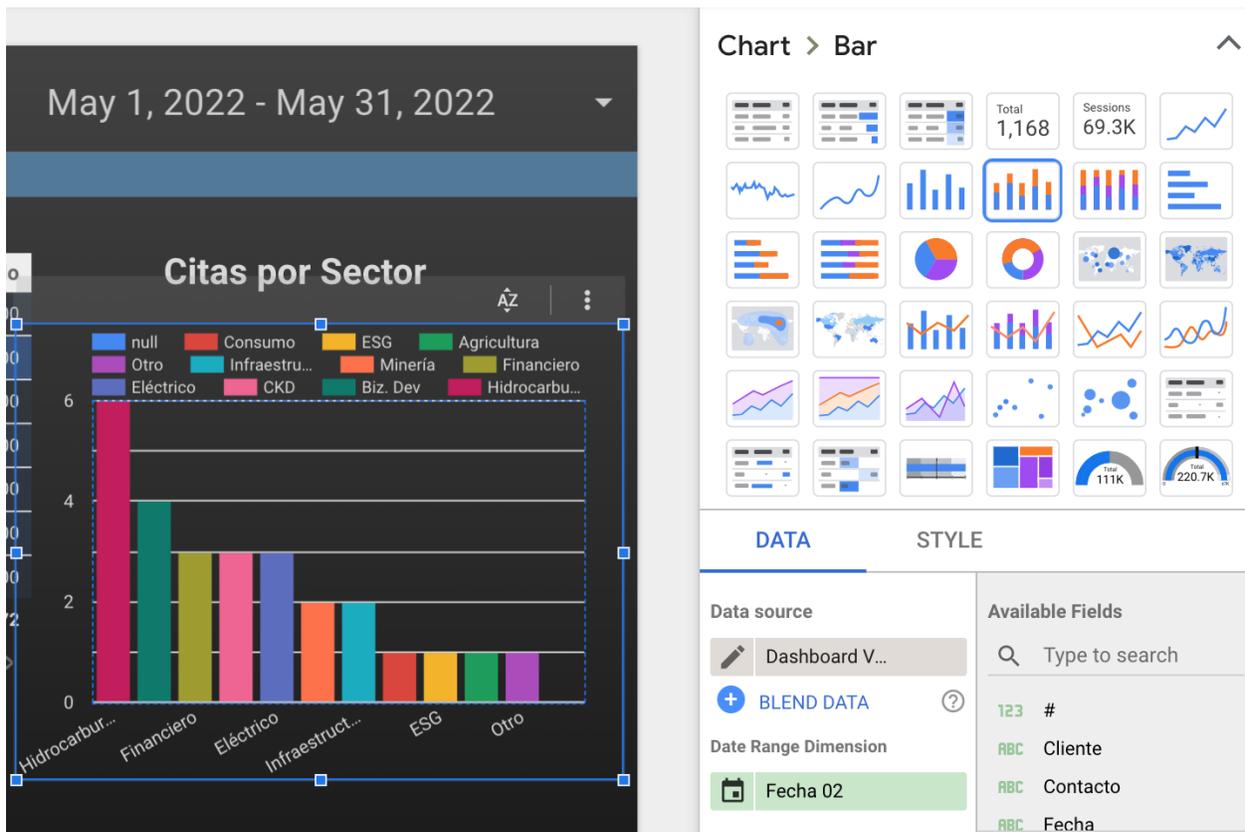


Figure 19 Chart option within Google Data Studio