NOVA IMS Information Management School

BUSINESS INTELLIGENCE II REPORT

2023/2024

HomeBuddy.

GROUP 28

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Contents

Introduction

Data has become one of the most crucial elements of any business operation in today's world. It doesn't matter whether a company is small, medium, or large; it is increasingly reliant on data collection and storage methods. From the beginning to the end of a business's operation, the amount of data it stores continues to increase with each passing day. For this reason, companies are investing in departments tasked with handling data and determining the best ways to store it according to the company's specifics. It is understanding the power of data that gives businesses more and more opportunities to grow. Analysing customers purchasing behaviour - how often they buy and what products they buy - is one of a company's most powerful assets.

With this information, it can make some changes in business operations that may lead to company growth.

HomeBuddy is an online home improvement platform that connects homeowners with local trusted contractors in the U.S. The way data is stored has always been a priority since the project's inception, as the founders have always realized the importance of data. Analysing data to identify patterns, inefficiencies, or even best-selling products is fundamental to ensuring the company has all the information it needs to make decisions.

In this project, based on the project that we made in the first semester in BI I, we will present all of the work we did. In addiction we will answer some business questions and show the results to the company.

Summary Business Overview

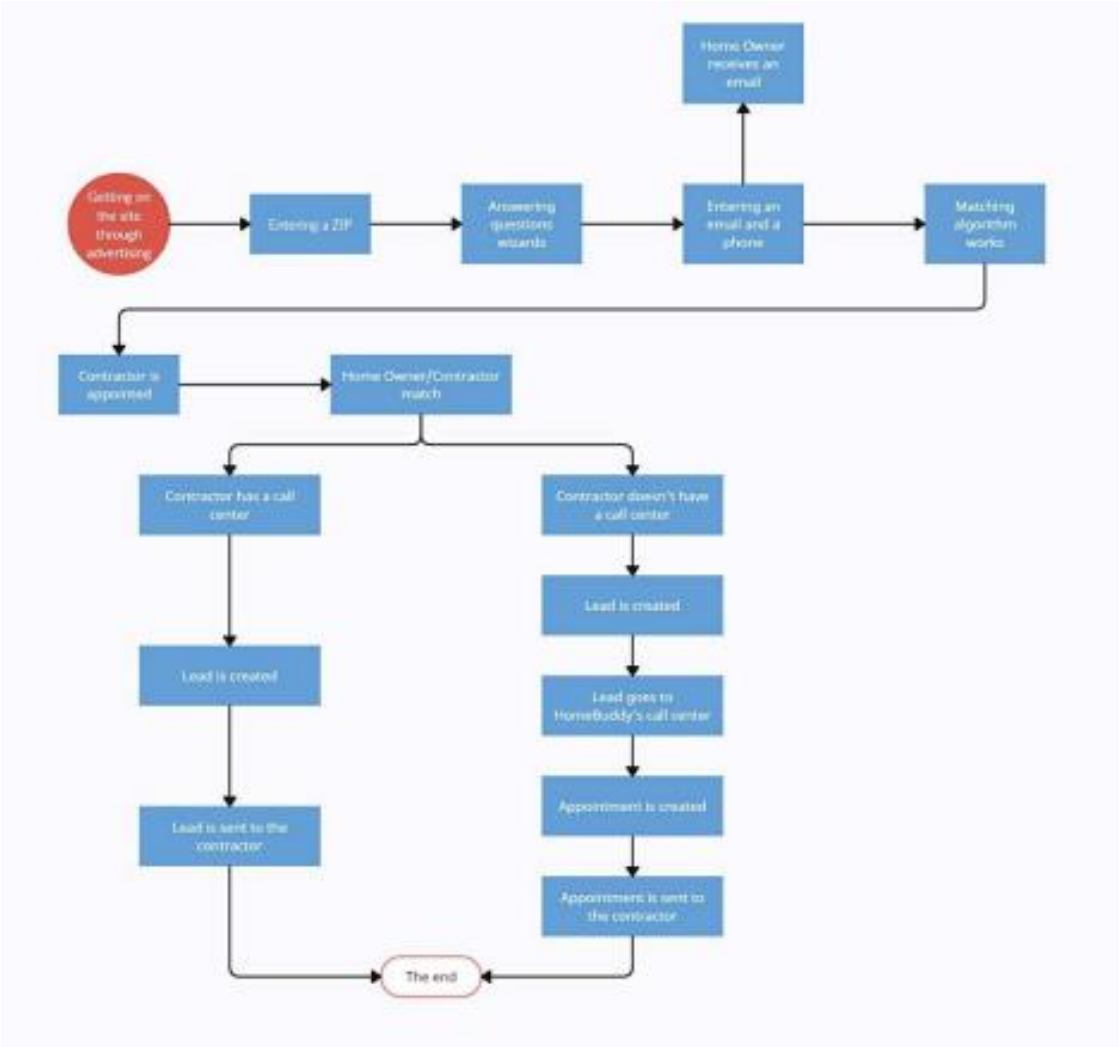
HomeBuddy is an online service project headquartered in Freienbach, Schwyz, Switzerland. The project was launched in early 2022 by The Siren Group company, with the CPO Andrey Markin and the CEO Max Entin leading the project. Previously, HomeBuddy was known as Siren Group AG, an agency that worked with large companies in the home improvement sphere. Having accumulated a lot of experience in this field, Max and Andrey decided it would be a great idea to launch their product in this niche.

Whether a homeowner is looking to remodel their kitchen, renovate their bathroom, or tackle a landscaping project, HomeBuddy provides a convenient and efficient way to find the right contractor for the work. The platform streamlines the entire process, from initial research and communication to hiring and managing the project, making home improvement projects easier and more transparent for homeowners. With HomeBuddy, homeowners can confidently take on their home improvement projects, knowing they have access to a network of trusted contractors committed to delivering high-quality work.

Contractors on HomeBuddy are carefully screened and verified to ensure they meet the platform's standards for quality and professionalism. It gives homeowners peace of mind knowing they are connecting with reliable and skilled professionals for their home improvement needs.

The project's main focus is providing services that simplify the process of finding and hiring contractors for home improvement projects in the United States of America. So, HomeBuddy does not provide services on its own, it only connects customers with contractors to complete home-improvement projects.

HomeBuddy targets renovations with a high average check, that is, major home improvements.



(Figure 1 - Company scheme workflow)

The workflow in Figure 1 summarizes the business process: the client accesses the website through an advertising or search page, provides all information about himself and his project, and submits the request. Next, HomeBuddy matches the homeowner with a contractor. Then two options are possible: the lead's scheme or the appointment's scheme. Usually, large and medium contractors work by leads, while small contractors work by appointment.

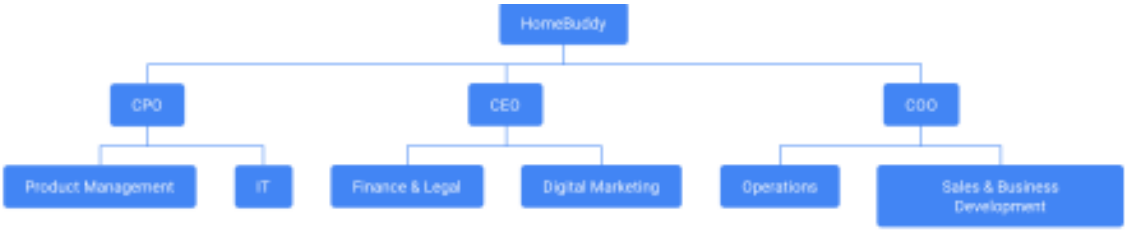
In the first case, the contractor is medium or large and has its own call center. Then HomeBuddy provides the homeowner's data and sells a lead to the contractor. After that, the contractor will call the homeowner themselves to schedule a time, and HomeBuddy gets paid for the lead.

In the second case, when the contractor is small and does not have its call center, HomeBuddy's Call Center calls the homeowners and schedules an appointment

based on the contractor's availability. Next, a meeting is held for estimating work, and HomeBuddy finally gets paid for the Appointment.

It is also important to mention that Contractors participate in an auction-based system for leads. This means that the price for each lead is not fixed and can vary every week for each Contractor. For instance, Contractor A may bid $20 per lead while Contractor B bids $25 per lead. As a result, Contractor B wins the lead. This auction rate for leads allows HomeBuddy to optimize its marketing budget and focus on high-quality leads that are more likely to convert into sales. Additionally, it provides contractors with a fair and transparent way to compete for business opportunities, ultimately benefiting both the company and the contractors.

1. Company Structure

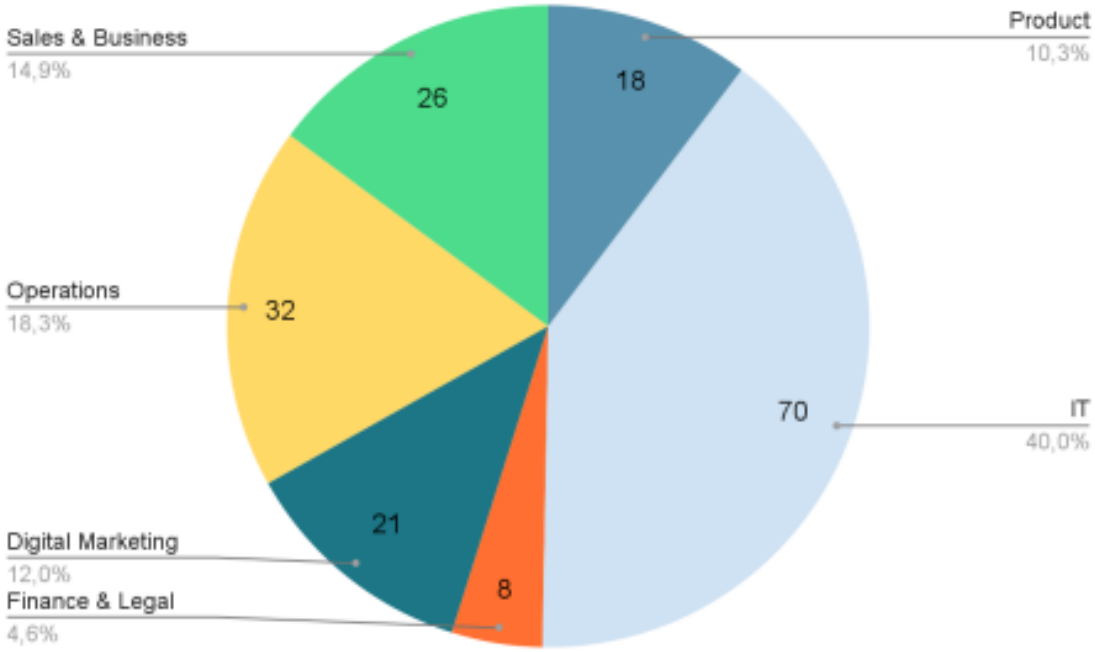


(Figure 2 - Company Scheme Structure)

HomeBuddy is structured into 6 main departments, each staffed with passionate individuals committed to continuous improvement. The major departments are the Operations department, Product Management, Digital Marketing, Finance & Legal, Sales & Business Development, and IT.

Since the focus of the company is on leads and their delivery, the department with the largest number of employees - 70 - is the IT department, as this is the one that handles the HomeBuddy platform.

Besides IT, Product Management also makes sure that the product (the platform itself) develops and grows. Digital Marketing handles advertising buying, Sales & Business Development is responsible for contracting with contractors, and Finance & Legal are in charge of the budget, Operations keeps track of the day-to-day running of the business.



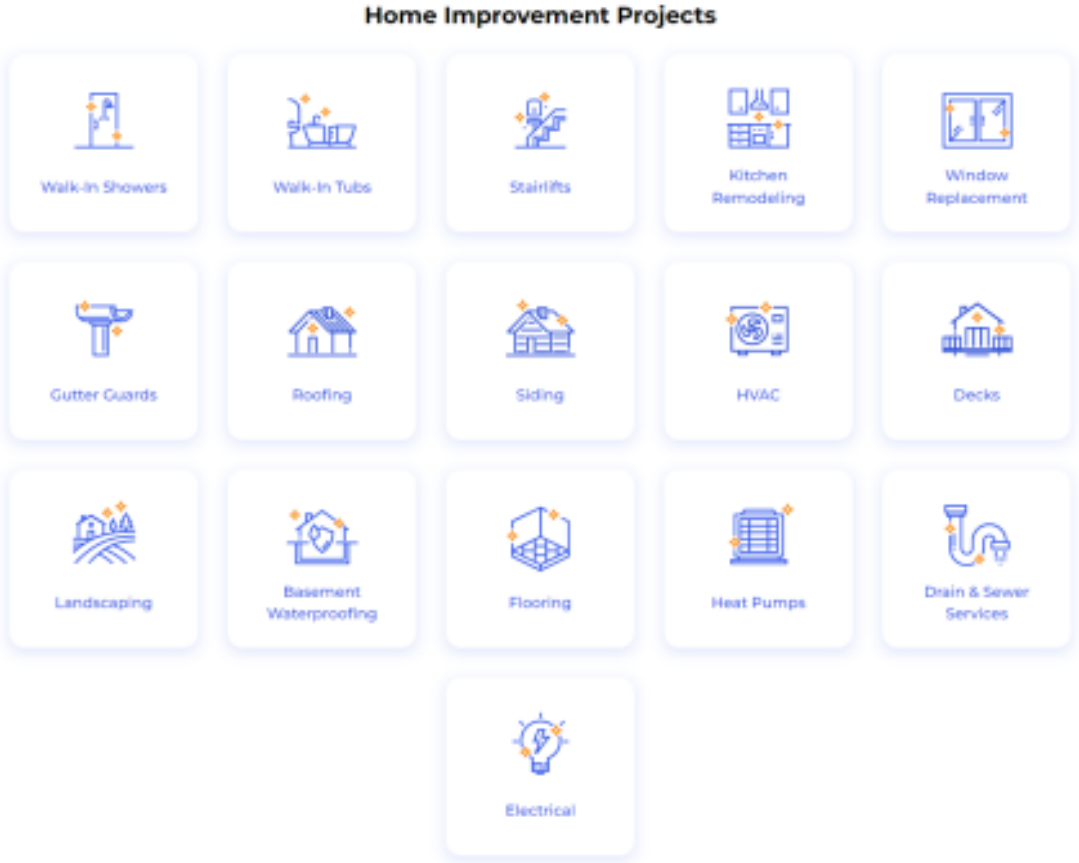
(Figure 3 - Employees distribution per department)

2. Target and Services

Regarding its customers, HomeBuddy has two main target groups of clients: a homeowner and a contractor. At the same time, there are three types of contractors: large (national), medium, and small.

The HomeBuddy platform is visited about 500 thousand times a month depending on the season. Audience composition can reveal a site's current market share across various audiences. HomeBuddy's audience is 36.95% male and 63.05% female. The largest age group of visitors is 65+ years old.

HomeBuddy works with different types of home improvement services: outdoors and indoors.



Outdoors include **7 types of services**: Window and Roof Replacement, Gutter Guards, Siding, Decks, Heat Pumps and Landscape Design.

Indoors include **8 types of services**: Shower and Kitchen Remodeling, Stairlifts, HVAC Replacement & Installation, Basement Waterproofing, Flooring, Drain & Sewer Services, and Electrical Services. It is evident that there is 1 more indoor service than outdoor.

Determining the most profitable type of work (outdoors/indoors) and the regions (states) where it generates the most revenue is crucial for the development of the HomeBuddy project. This information will provide valuable insights into the main focus of the company.

3. Data Warehouse

The Data Warehouse (DW) is a collection of integrated, subject-oriented databases designed to support decision system functions, where each unit of data is non-volatile, meaning that once the data is entered into the warehouse data should not change, and is relevant to some moment in time (Sharda, Delen & Turban, 2017).

It serves as a central repository for business-related data, integrating information from various sources to support reporting, analytics, and decision-making processes. The primary goal of a data warehouse is to provide a consolidated and consistent view of an organization's data, allowing users to gain valuable insights and make informed decisions.

In a data warehouse, data is typically organized into two main types of tables: dimension tables and fact tables. Dimension tables store descriptive attributes, such as customer details or product information, while fact tables contain quantitative data like sales, revenue, or other measurable metrics. The schema of a data warehouse is crucial to its effectiveness, and common design patterns include star schema and snowflake schema.

3.1. Dimensional Model

There are two main methods to create/design a DW: Moody & Kortnik method and Ralph Kimball method. The first design method is based on the database structure and design, so it classifies the entities and identifies the hierarchies to develop the model (D. Moody, M. Kortink, n.d.). The second design, instead of the data structure, is based on the business problem and needs, and it follows 4 steps: identify the needs, the grain, the dimensions, and finally the fact tables (Kimball Group, 2016).

Step-by-Step Dimensional Modeling (Kimball’s “4-step recipe”):

3.2. Identify the business process

Identify the business process the DW will represent. This process will be the source of the metrics and measurements. In other words, what are we “really” trying to measure and analyze?

Kimball considers the business processes as the operational activities that are performed by the organization. Those processes are the metrics of performance that we want to measure in the fact table (Kimball Group, 2016).

According to the business context, it is possible to identify the following business processes:

Lead sales - HomeBuddy is a marketplace connecting homeowners seeking home improvement homeowners with contractors providing those services. When a homeowner requests services on the platform, HomeBuddy matches them with an appropriate service contractor. HomeBuddy charges the contractor a fee for providing this lead and facilitating the service matchmaking. So, the core business is centered around acquiring homeowners from ads and selling those leads to relevant contractors, generating revenue in the process.

3.3. Identify the grain

The grain represents the level of detail in the information considered for the business process and relies on the business needs (Kimball Group, 2016).

Based on the business needs and identification of the business process, the finest grain is:

- Sales by Lead (name, city, country), Contractors (name, city, country), Service (name, minimum bid for app, minimum bid for lead) zip code (zip code, state, city) and Date (year, quarter, month, day of the week).

3.4. Identify the dimensions

The dimensions should be, as much as possible, descriptive (stored as text type in database) and confirm the grain. Together, the set of dimensions will define the level of detail in our DW.

Date

In the date dimension, we can provide a timely context of when the lead and contractor were created. It provides context and structure to time-related data, allowing

for meaningful analysis and reporting. The date dimension is critical for time-based analysis. It enables users to answer questions such as when specific events occurred, how performance changes over time, and what trends or seasonality exist in the data.

In this dimension we have information on a day, week, month, quarter, and year basis, we also have the actual date.

Service

In the service dimension, we can understand more about the service, such as the full name, in which category fits, and the minimum bid for the app and lead.

Lead

In the lead dimension, we have the full name and the identification number of the lead.

Contractors

In the contractor's dimension we have more information about the contractors, such as the name of the contractor, what services they provide, and when they were created in the database.

Zip Code

In the Zip Code dimension, we have the name of the city, state, density, and population of each zip code and GDP for states, so we can analyse in which zip code we have the most leads, contractors, or services.

3.5. Finally identify the facts

• In this step the measures (or metrics or facts) are identified. These facts should be numerical and also confirm the grain defined in step #2. The quantities enable us to measure our transactions.

Lead Sales

The fact table Lead Sales measure allows Home Buddy to evaluate the amount of money they gain for lead. This table allows Home Buddy to quantify the amount of their sales with leads they sell to contractors and the profit they make in each lead. This fact is important and decisive for the company's decision-making, with that they can think of doing more advertisements for some zip codes, investing more in some contractors, and following up with leads.

The dimensional model is characterized by simplicity and ease of use, making it well-suited for business intelligence and reporting applications. Common dimensional modelling schemas include the star schema and snowflake schema. Dimensional modelling is a key component of effective data warehousing and facilitates the creation of user-friendly, high-performance analytical environments.

Business Needs

1) What were the company's top-selling services, categorized by type, city, and monthly sales?

In addressing the inquiry about the company's highest-selling services, we embark on a comprehensive analysis aimed at understanding the dynamics of service sales across various dimensions. This exploration involves categorizing services based on type, city, and the specific month in which these notable sales occurred.

We seek to identify the services that have consistently performed well, taking into account the geographic locations. By understanding the factors contributing to the success of specific services, we can tailor our strategies to maintain and enhance this performance.

By using location-specific data, we can identify profitable markets. Simultaneously, we can develop targeted marketing strategies to sustain growth in these profitable markets and explore opportunities to improve performance in underperforming regions.

Examining the months in which the company achieved its highest service sales provides insights into the effectiveness of past strategies. Identifying and reusing successful techniques can enhance future growth prospects, guiding the refinement of our approach to align with customer preferences.

2) What were the highest and lowest gross sales amounts monthly, categorized by state, city, services, and service category?

Analysing HomeBuddy gross sales amounts provides a comprehensive view across various dimensions. The assessment covers the highest and lowest gross sales figures, considering month, city and service. The breakdown by months helps identify peak and off-peak periods, allowing for a nuanced understanding of the effectiveness of sales strategies over time.

Categorizing sales by city unveils geographical trends, guiding targeted marketing efforts and interventions in underperforming regions. Examining gross sales amounts by service category offers insights into products significantly impacting overall sales,

facilitating resource allocation and strategic marketing decisions. Additionally, the analysis of gross sales in understanding customer preferences, guiding decisions to enhance customer retention and avoid potential revenue loss. In summary, these analyses provide valuable insights into HomeBuddy financial performance, guiding strategic decisions to refine approaches, address challenges, and capitalize on growth opportunities for overall customer satisfaction and sustained success.

3) In which state and service do we have the highest number of out-of-area homeowners, i.e., customers for whom we have no contractors?

Identifying services and states with lower coverage allows us to strategically allocate ad investments or boost contractor presence in those areas. This insight guides our approach to each state and service, ensuring a balanced and targeted strategy for optimal coverage and operational efficiency.

4) Which day of the week, and month of the year the company experienced the highest and lowest lead sales in the past year?

Analysing lead sales, we aim to identify the days of the week and months of the year with the highest and lowest sales. This detailed examination enables us to discern patterns that inform adaptations in our marketing strategy. By understanding the peak days and months for lead sales, we can predict the number of ads we need, manage service requests effectively, capitalize on strong periods, and intervene to enhance performance during weaker times. This comprehensive analysis of both weekly and monthly sales patterns is instrumental in optimizing our marketing strategies for sustained growth.

5) What regional dependencies exist in lead conversion rates categorized by state, city and ZIP?

There is interest in examining differences in lead conversion rates across geographic areas, specifically between states and cities. The goal is to uncover whether completion percentages for lead generation questionnaires vary notably depending on the customer’s location. Discovering regions with higher or lower conversion performance allows us to tailor our lead-generation tactics to local market dynamics, driving

improvements through targeted interventions. This granular data serves as an invaluable tool for refining our approach and aligning our efforts with the unique needs and behaviors of each region.

6) **How does the ratio of GDP correlate with the sales volume in each state?**

Examining the financial capacity of individuals in each state alongside their sales performance provides crucial insights for strategic decision-making. By identifying locations with higher economic affluence, we can strategically concentrate advertising efforts for optimal results. Furthermore, this analysis aids in planning business expansion by targeting areas with greater growth potential, aligning with their economic strength and sales performance.

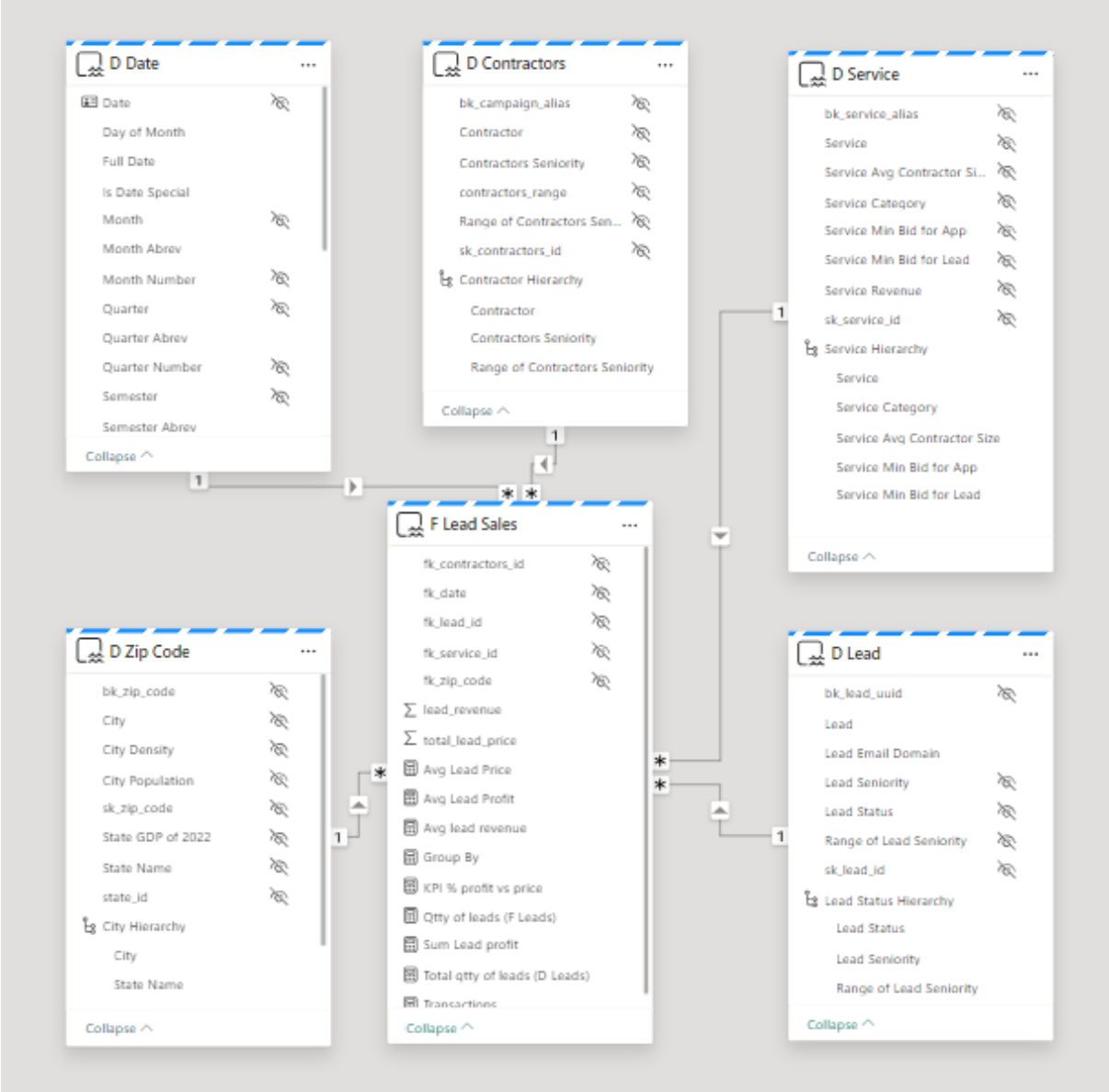
7) **What percentage of users opt not to complete the questionnaire and instead close the tab prematurely in different services?**

This metric serves as a crucial indicator of user engagement and satisfaction with the survey experience. By analyzing this abandonment rate, we gain insights into potential usability issues, content concerns, or other factors that may hinder users from completing the questionnaire. Understanding the reasons behind premature tab closures provides valuable information for refining the questionnaire design, optimizing content, and tailoring strategies to improve user retention.

8) What is the list of contractors, their seniority levels, and the average profit we make from selling each lead to these contractors?

Determining which contractors generate the highest average profit per lead can help identify the most valuable partners. This allows us to focus on strengthening relationships and offering incentives to these high-performing contractors.

Semantic Model



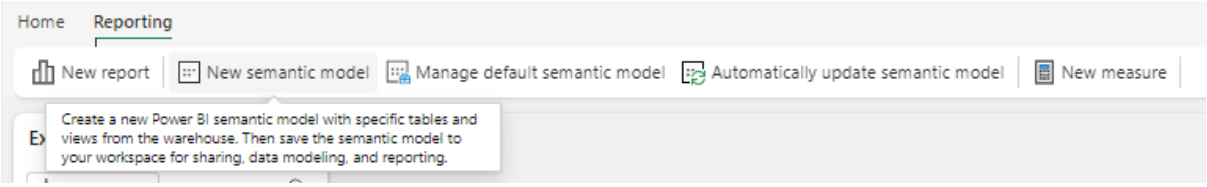
(Figure 4 – Semantic Model)

The semantic model developed by our group within Microsoft Fabric plays a crucial role represents the meanings and relationships of data elements within a specific context. Furthermore, semantic models support more efficient data integration and query capabilities, enabling organizations to leverage their data more effectively for decision-making and innovation.

Next, there is the steps that we followed to build an effective semantic model:

1st Step - Accessing the Data Warehouse

Navigate to the Data Warehouse section in Microsoft Fabric and create a New Semantic Model



2nd Step - Establish relationships between dimension tables and the fact table.

Leads Dimension Table:

Connect sk_lead from the leads dimension table to fk_lead in the fact table.

Contractors Dimension Table:

Connect sk_contractors_id from the contractors dimension table to fk_contractors_id in the fact table.

Service Dimension Table:

Connect sk_service_id from the service dimension table to fk_service_id in the fact table.

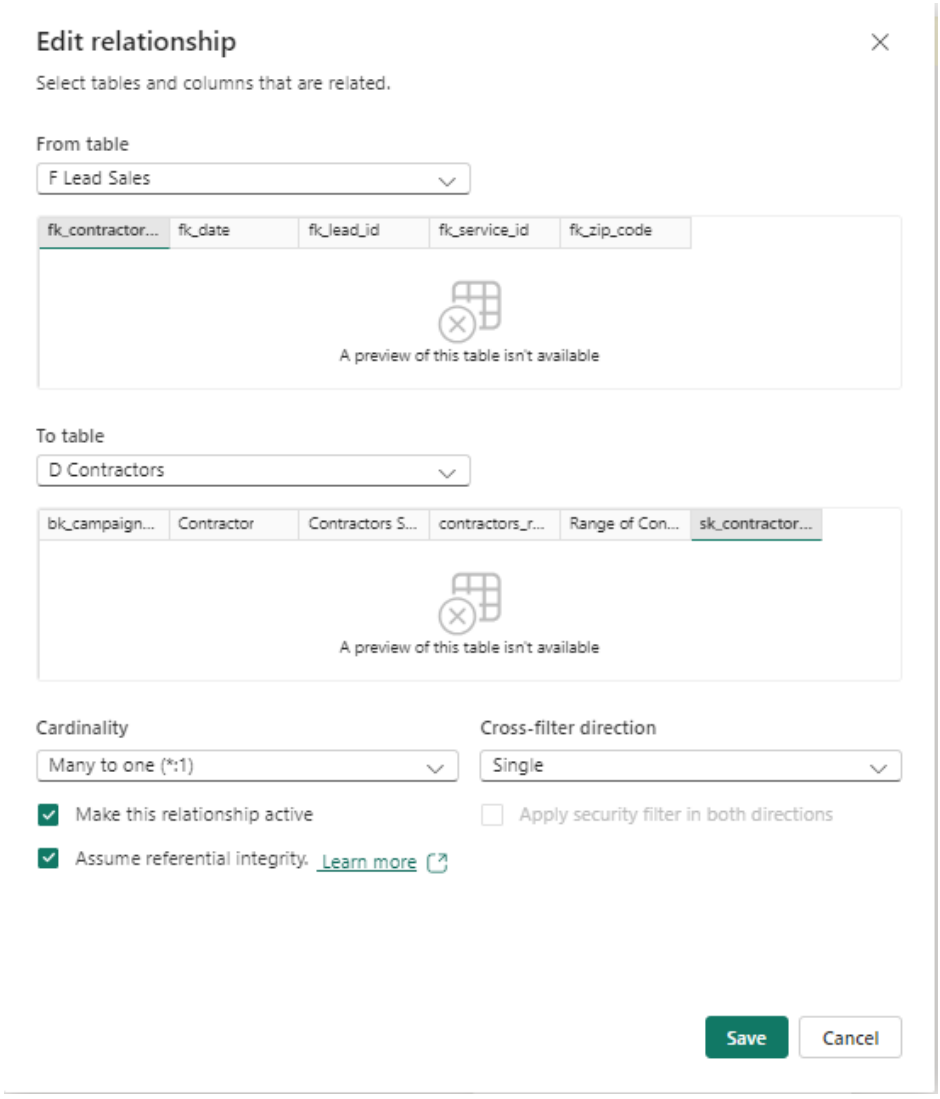
Zip Code Dimension Table:

Connect sk_zip_code from the zip code dimension table to fk_zip_code in the fact table.

Date Dimension Table:

Connect sk_date from the date dimension table to fk_date in the fact table.

All relationships were configured as **many-to-one** (many entries in the fact table correspond to a single entry in the dimension table) and always assuming referential integrity.


Edit relationship
Select tables and columns that are related.
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fk_contractor...
fk_date
fk_lead_id
fk_service_id
fk_zip_code
A preview of this table isn't available
To table
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bk_campaign...
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contractors_r...
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sk_contractor...
A preview of this table isn't available
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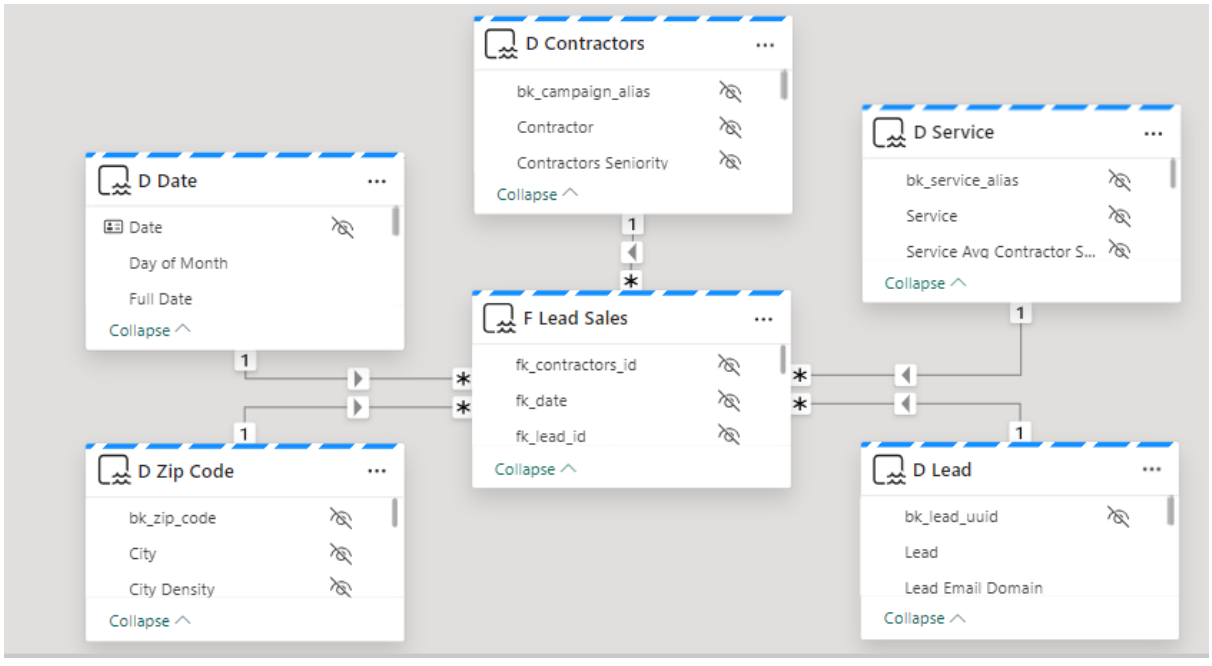
Many to one (*:1)
Cross-filter direction
Single
Make this relationship active
Apply security filter in both directions
Assume referential integrity.
Learn more
Save
Cancel


D Contractors
bk_campaign_alias
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D Service
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D Date
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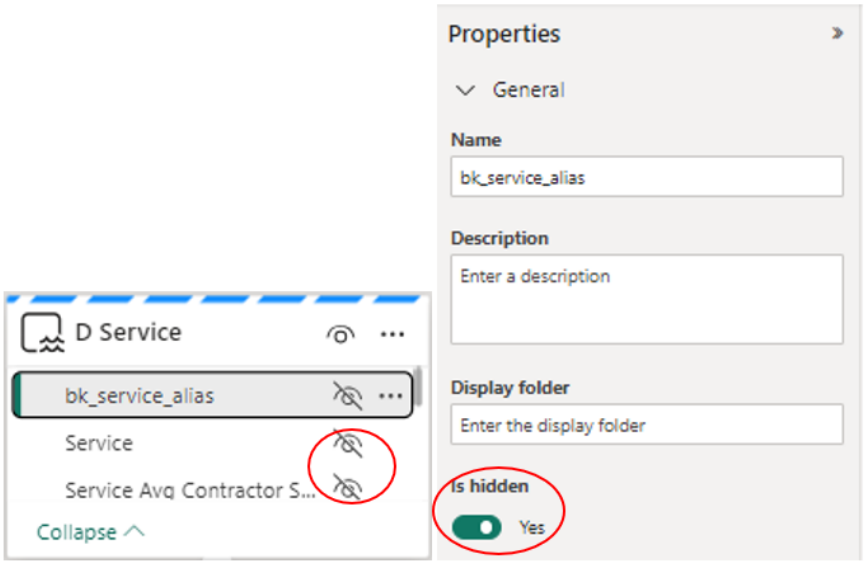
Collapse
F Lead Sales
fk_contractors_id
fk_date
fk_lead_id
Collapse
D Zip Code
bk_zip_code
City
City Density
Collapse
D Lead
bk_lead_uuid
Lead
Lead Email Domain
Collapse

3rd Step - Modify the names of columns and tables.

Change the names of columns and tables to more user-friendly terms to enhance understandability for the end user. Guarantee that the final model is intuitive and easily comprehensible for non-technical users.

4th Step – Hiding Technical Attributes

Hide all technical attributes that are not relevant to the end user, as surrogate keys, business keys, and other technical columns.



5th Step - Creating and Defining Hierarchies for Dimension Tables

Lead Dimension:

Hierarchy: Lead Status, Lead Seniority, Range of Lead Seniority.

Contractors Dimension:

Hierarchy: Contractor, Contractor Seniority, Range of Contractors Seniority.

Date Dimension:

Hierarchy: Year, Semester, Quarter, Month.

Service Dimension:

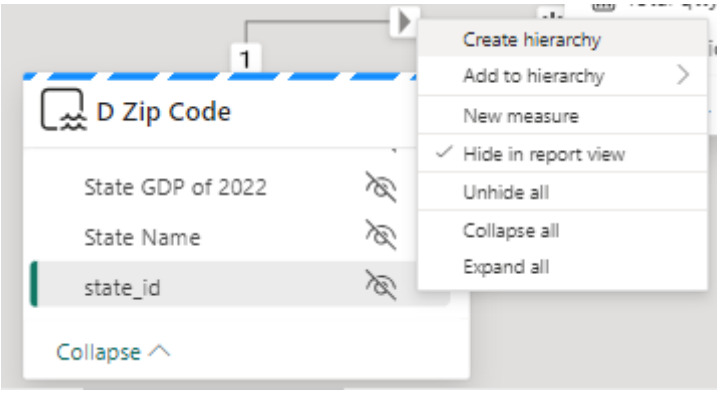
Hierarchy: Service, Service Category, Service Avg Contractor Size, Service Min Bid for App, Service Min Bid for Lead.

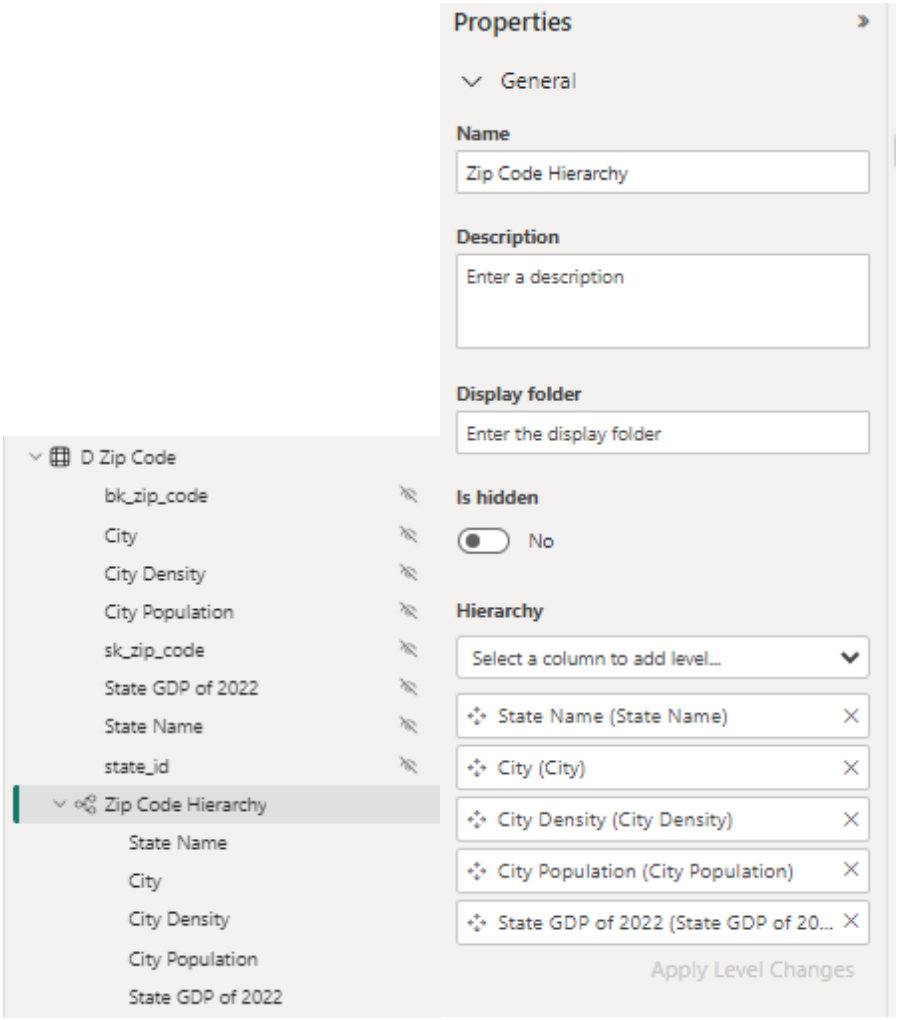
Zip Code Dimension:

Create hierarchy: City, State Name, City Density, City Population, State GDP of 2022.

Other steps to do after the creation of the hierarchy;

- Change the name of the hierarchy;
- Hide all attributes included in the hierarchies from the dimensions to avoid duplication in dashboards, paginated reports and other things we may need to do.




Properties
General
Name
Zip Code Hierarchy
Description
Enter a description
Display folder
Enter the display folder
Is hidden
No
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Select a column to add level...
State Name (State Name)
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City Density (City Density)
City Population (City Population)
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City Density
City Population
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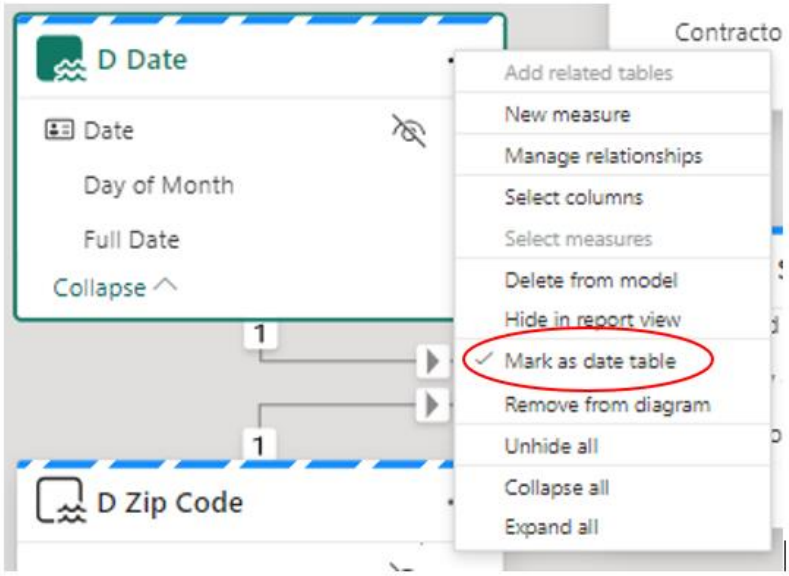
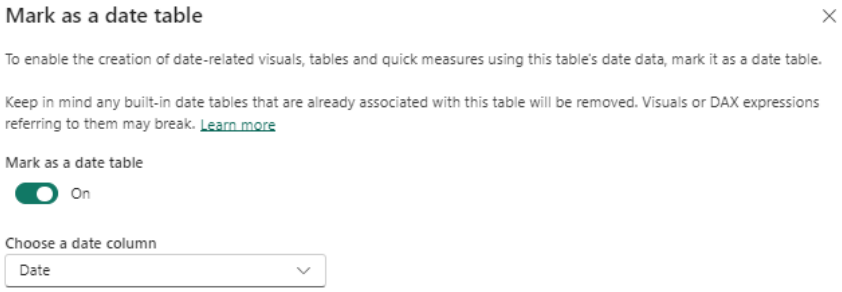
State Name
City
City Density
City Population
State GDP of 2022

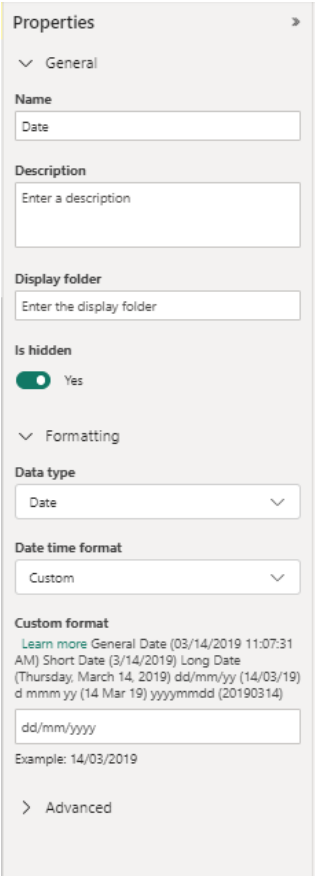
6th Step – Mark date dimension as Date Table





7th Step – Transform the properties of columns in Date Dimension

Change the data type of the date column to Date type and custom the format of the date to dd/mm/yyyy.



8th Step – Transforme Default Measures in Calculated measures in Fact Leads Table

In this step we transformed the default measures into calculated measures in order to be more explicit, however we could use the default measures.

So we did this to the default measures: - lead_revenue and total_lead_price, and transformed (by using Dax calculations “Sum”) that to Sum of Lead Revenue and Sum of Lead Price. After that we hide the default measures in order to don’t duplicate information.

9th Step – Calculate new measures in Fact Leads Table

We used Dax calculations to crrate measures in the fact leads table to facilitate specific calculations and analysis.

Measures

1st – Average Lead Price - Avg Lead Price = AVERAGE('F Lead Sales'[total_lead_price])

The main point of this measure is to see in average how much we pay, in annuncements, for lead.

2nd – Average Lead Revenue - Avg lead revenue = AVERAGE('F Lead Sales'[lead_revenue])

The second measure goal is to see how much we receive in average per lead we sold to the contractors.

3rd – Average Lead Profit – is the difference between the last two measures.

4th – Number of transactions - Nr of Transactions = COUNTROWS('F Lead Sales')

See the number of transactions we have in our fact lead sales.

5th – Quantity of leads in our fact leads- Qtty of leads (F Leads) = count('F Lead Sales'[fk_lead_id])

The main goal of this measure is to see how many rows we have in our fact lead sales

6th – Quantity of leads in our leads dimension - Qtty of leads (D Leads) = COUNTX('D Lead', "Out of area")

The goal of this measure is to see how many rows we have in our dimension leads in order to compare with the number of leads in our fact leads. So, we can see how many leads don’t match contractors, where and why.

7th – Gross Sales Value - Gross Sales Value = SUMX('F Lead Sales','F Lead Sales'[total_lead_price]*'F Lead Sales'[Qtty of leads (F Leads)])

KPI's

1st – KPI % profit vs price = ([Avg Lead Profit]-[Avg Lead Price])/[Avg Lead Price]

With this KPI we So, the formula is calculating the difference between the profit made and the selling price, divided by the selling price. This yields a measure of profitability relative to the selling price. In simple terms, it shows how much of the selling price is profit relative to the cost of the item.

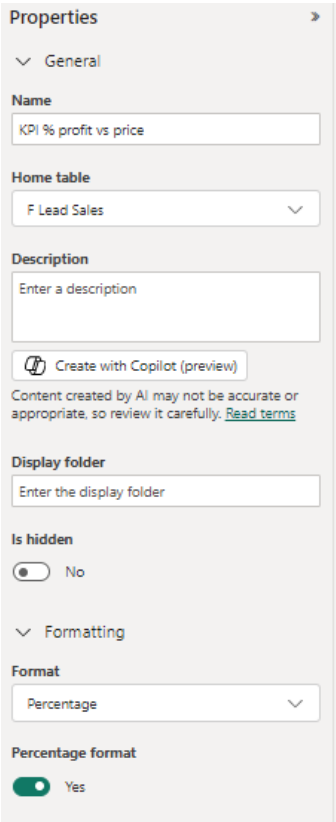
2nd – KPI % Converted Leads - KPI % Converted Leads = ('F Lead Sales'[Qtty of leads (F Leads)]/'F Lead Sales'[Qtty of leads (D Leads)])

This KPI help us to identify the % of leads that we could convert in real transactions and gave us some revenue.

3rd – KPI % Profit vs Revenue - KPI % Profit vs Revenue = ('F Lead Sales'[Sum Lead profit]/'F Lead Sales'[Sum of Lead Revenue])

This KPI give us the notion of what is the % of Profit take in consideration the total of revenue.

For the KPI's we applied the Percentage format, as shown below:



Reporting & Dashboarding

Paginated Reports

Fabric Paginated Report 1

BN 1 - What were the company's top-selling services, categorized by type, state, city, and monthly sales?

Year	Month	Service	City	lead_revenue
2021	January	Stair Lifts	Forest	$250
2021	January	Stair Lifts	Garyville	$250
2021	January	Stair Lifts	Goodland	$250
2021	January	Stair Lifts	Lewisville	$250
2021	January	Stair Lifts	Palmyra	$250
2021	January	Stair Lifts	South Otselic	$250
2021	January	Walk in Showers	Aberdeen Proving Ground	$247.5
2021	January	Walk in Showers	Addison	$247.5
2021	January	Walk in Showers	Aguilar	$247.5
2021	January	Walk in Showers	Albany	$247.5
2021	January	Walk in Showers	Aliquippa	$247.5
2021	January	Walk in Showers	Alma Center	$247.5
2021	January	Walk in Showers	Andover	$247.5
2021	January	Walk in Showers	Atwater	$247.5
2021	January	Walk in Showers	Auburn	$247.5
2021	January	Walk in Showers	Barry	$247.5
2021	January	Walk in Showers	Baxter	$247.5
2021	January	Walk in Showers	Beacon	$247.5
2021	January	Walk in Showers	Beavercreek	$247.5
2021	January	Walk in Showers	Beecher Falls	$247.5
2021	January	Walk in Showers	Beechgrove	$247.5
2021	January	Walk in Showers	Belcamp	$247.5
2021	January	Walk in Showers	Bentonville	$247.5
2021	January	Walk in Showers	Berwyn	$247.5
2021	January	Walk in Showers	Bessemer City	$247.5
2021	January	Walk in Showers	Big Lake	$247.5
2021	January	Walk in Showers	Big Rock	$247.5
2021	January	Walk in Showers	Birch Run	$247.5
2021	January	Walk in Showers	Blossvale	$247.5
2021	January	Walk in Showers	Bowling Green	$247.5
2021	January	Walk in Showers	Brainerd	$247.5
2021	January	Walk in Showers	Bronson	$247.5
Total				**$5,070,205**

With this Paginated Report we can see and answer our first business question, “What were the company’s top-selling services, categorized by type, city and monthly sales.

By analyzing service sales data over time, the company aims to pinpoint regions where services have performed well consistently. This analysis helps in developing targeted marketing strategies to sustain growth in profitable markets and improve performance in underperforming regions. Additionally, examining the months with the highest service sales provides insights into the effectiveness of past strategies. Identifying successful techniques from these insights can guide future growth by refining approaches to align with customer preferences.

Fabric Paginated Report 2

BN 2 - List of Gross Sales Amount per service, city and month

Year	Month	City	Service	Sum of Lead Revenue
2021	January	Aberdeen Proving Ground	Walk in Showers	$247.5
2021	January	Addison	Walk in Showers	$247.5
2021	January	Aguilar	Walk in Showers	$247.5
2021	January	Aiken	Walk in Tubs	$330
2021	January	Albany	Walk in Showers	$247.5
2021	January	Aliquippa	Walk in Showers	$247.5
2021	January	Allen	Walk in Tubs	$330
2021	January	Alma	Walk in Tubs	$330
2021	January	Alma Center	Walk in Showers	$247.5
2021	January	Amberson	Walk in Tubs	$330
2021	January	Andover	Walk in Showers	$247.5
2021	January	Arroyo Grande	Walk in Tubs	$330
2021	January	Atwater	Walk in Showers	$247.5
2021	January	Auburn	Walk in Showers	$247.5
2021	January	Ava	Walk in Tubs	$330
2021	January	Barry	Walk in Showers	$247.5
2021	January	Baxter	Walk in Showers	$247.5
2021	January	Beacon	Walk in Showers	$247.5
2021	January	Beavercreek	Walk in Showers	$247.5
2021	January	Beecher Falls	Walk in Showers	$247.5
2021	January	Beechgrove	Walk in Showers	$247.5
2021	January	Beggs	Walk in Tubs	$330
2021	January	Belcamp	Walk in Showers	$247.5
2021	January	Bentonville	Walk in Showers	$247.5
2021	January	Berkeley	Walk in Tubs	$330
2021	January	Berwyn	Walk in Showers	$247.5
2021	January	Bessemer City	Walk in Showers	$247.5
2021	January	Big Bear Lake	Walk in Tubs	$330
2021	January	Big Lake	Walk in Showers	$247.5
2021	January	Big Rock	Walk in Showers	$247.5
2021	January	Binger	Walk in Tubs	$330
2021	January	Birch Run	Walk in Showers	$247.5
Total				**$5,070,205**

With this Paginated Report we can see and almost answer our second business question, “What were the highest and lowest gross sales amounts monthly, categorized by city and services?”

Analyzing HomeBuddy's gross sales reveals insights across various dimensions, including month, city, and service category. This analysis helps identify peak and off-peak periods, geographical trends, and impactful products. Understanding leads preferences guides decisions to enhance retention and avoid revenue loss, informing strategic decisions for sustained success and customer satisfaction.

The highest and lowest gross sales amounts can only be determined by manually searching through the entire table.

Fabric Paginated Report 3

List of our Contractors with detail of seniority and Average Lead Profit

Contractor	Contractors Seniority	Average Lead Profit
A Safe Solution Walk In Tubs-WIS	9	$230.8333
A Safe Solution Walk In Tubs-WIT	9	$280
Affordable Walk Ins-WIT	9	$310
Ageless Bathing-WIT	9	$330
Alenco, Inc.-WIS	11	$212.6923
Alenco, Inc.-WIT	11	$305
Alenco, Inc.-WR	11	$210
All American Roofing Co.-WR	11	$85
All County One Day Bath-WIS	9	$247.5
All State Spa Tubs and Showers-WIS	9	$247.5
All State Spa Tubs and Showers-WIT	9	$330
All States Home Improvement LLC-WIS	11	$221.3043
Alure Home Improvements - Nassau & Suffolk KR-SD	12	$245
Alure Home Improvements - Nassau & Suffolk KR-WIS	12	$219.45
Alure Home Improvements - Nassau & Suffolk KR-WIT	12	$305
Alure Home Improvements - Nassau & Suffolk KR-WR	12	$163
Amazing Walk-In Tubs-WIT	9	$322
AmeriBath-WIS	7	$224.7727
American lotus-WIS	9	$222.5
American lotus-WIT	9	$305
American Masters Walk-In Tubs-WIT	9	$309.3103
American Standard-WIT	9	$311.2787
American Walk In Tub Factory-WIT	9	$296.6667
Ameritech Windows-WR	9	$162.5
Atlas DC-KR	13	$270
Total		**$242.5539**

With this Paginated Report, we can explore and nearly answer our business question, “What is the list of contractors, their seniority levels, and the average profit we make from selling each lead to these contractors?”

Analyzing this report on contractors reveals insights across various dimensions, including contractor names, their seniority levels, and the average profit from leads. This

analysis helps identify trends in contractor performance, the impact of seniority on profitability, and the most lucrative partnerships. Understanding these factors guides decisions to optimize contractor relationships, enhance profitability, and inform strategic decisions for sustained success and customer satisfaction.

The exact details of contractor seniority and average profit can only be determined by manually searching through the entire table.

Fabric Paginated Report 4

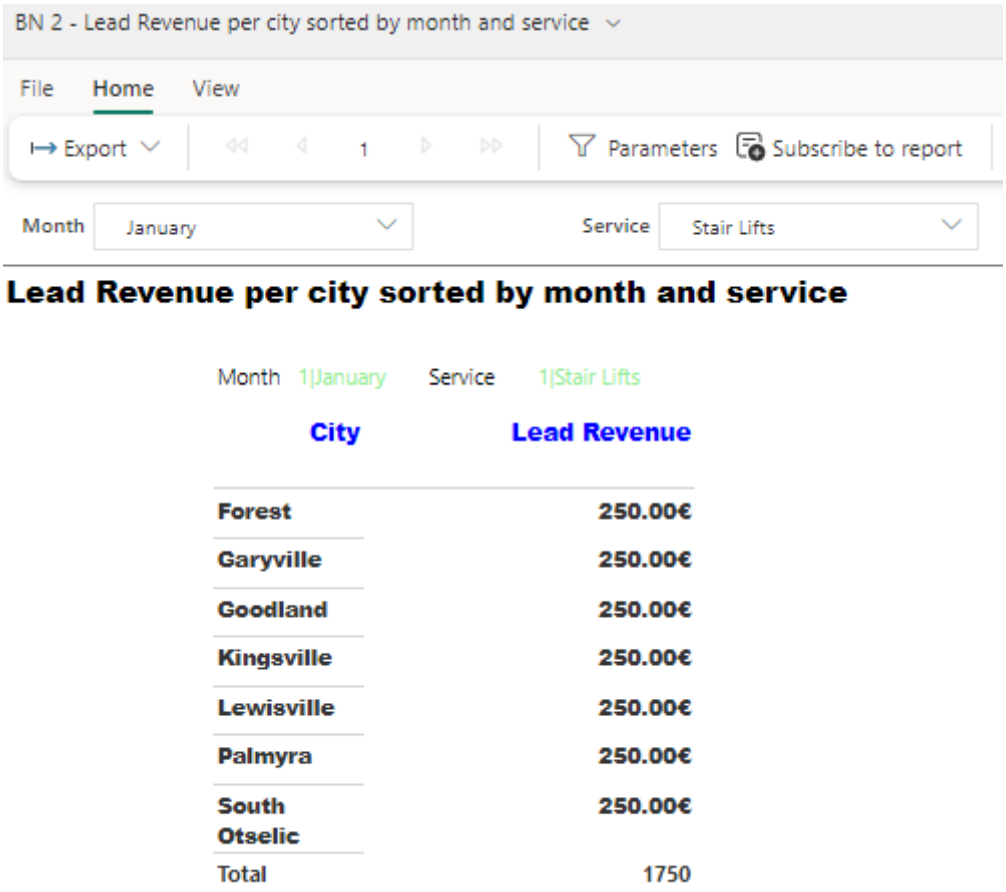
BN 6 - How does the ratio of GDP correlate with the sales volume in each state

State Name	State GDP of 2022	Sum of Lead Revenue
Alabama	235807.3	$90,440
Alaska	50315.1	$660
Arizona	403474.2	$76,102.5
Arkansas	137355.5	$51,210
California	3167460.8	$331,050
Colorado	416114.4	$95,987.5
Connecticut	276668.8	$825
Delaware	75172.6	$13,785
District of Columbia	144029.6	$4,965
Florida	1218430.2	$224,305
Georgia	655827.3	$123,415
Hawaii	85211.4	$330
Idaho	91683.7	$43,807.5
Illinois	864170.9	$249,402.5
Indiana	396009.2	$163,067.5
Iowa	197846.3	$124,327.5
Kansas	174794.6	$85,390
Kentucky	217568.1	$90,790
Louisiana	231262.3	$72,300
Maryland	412282.6	$95,685
Massachusetts	604357.7	$990
Michigan	539898.2	$203,870
Minnesota	379111.5	$142,035
Mississippi	114152.9	$47,962.5
Missouri	336625.8	$147,252.5
Montana	53983.4	$35,557.5
Nebraska	137078.1	$42,772.5
Nevada	187226.2	$30,922.5
New Hampshire	90150.5	$742.5
New Jersey	646731.3	$1,072.5
New Mexico	101315	$41,460
New York	1763524.6	$335,820
North Carolina	609058.2	$172,425
Total		$5,070,205

With this Paginated Report, we can explore and almost answer our business question, “How does the ratio of GDP correlate with the sales volume in each state?”

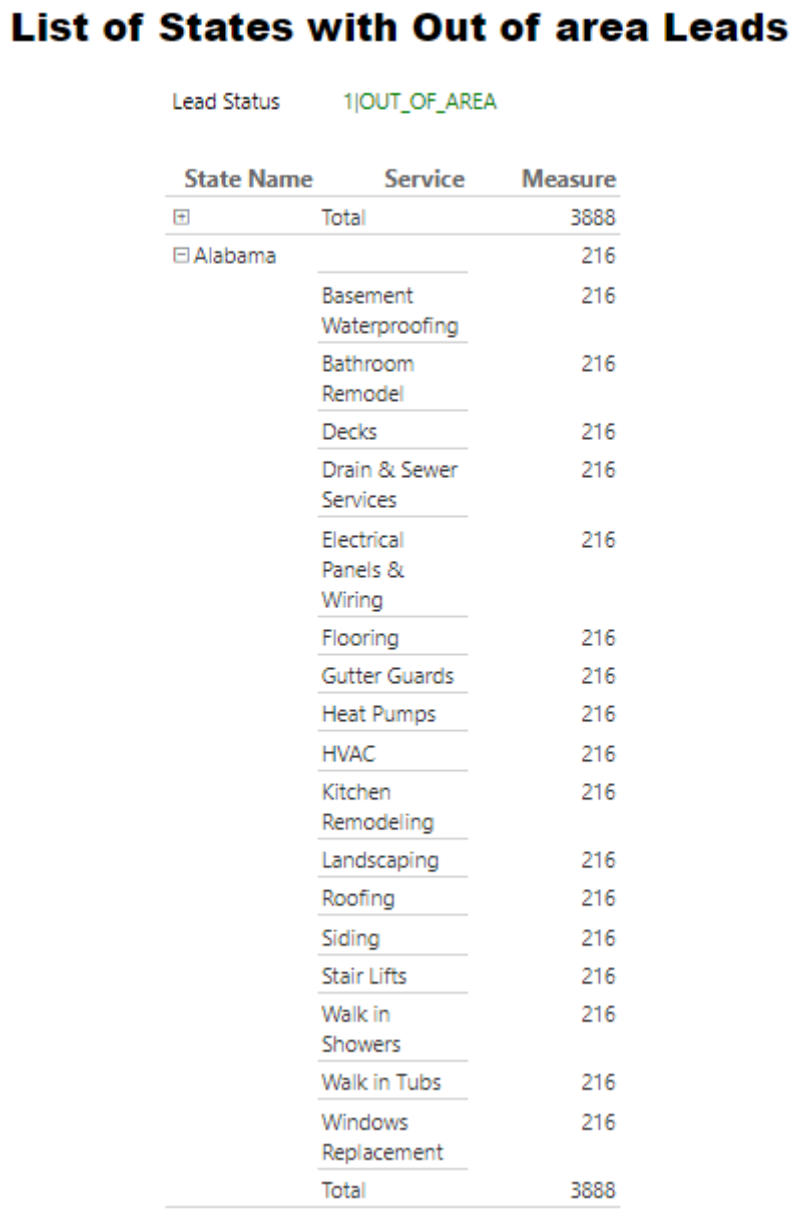
Understanding the correlation between the GDP ratio and sales volume in each state can help identify whether economic activity is a significant driver of sales. This can reveal how economic health impacts our business performance. For instance, regions with high GDP but low sales might need a different approach compared to regions with high sales relative to their GDP.

Power BI Report Builder Paginated Report 1



Our paginated report in Power BI Report Builder enables users to analyze lead revenue by city and service. By selecting specific months and service categories, users can obtain insights into revenue trends across different locations and service types. With that users can make data-driven decisions, and track revenue performance over time and across locations.

***Power BI* Report Builder Paginated Report 2**



List of States with Out of area Leads

Lead Status 1|OUT_OF_AREA

State Name	Service	Measure
⊞	Total	3888
⊟ Alabama		216
	Basement Waterproofing	216
	Bathroom Remodel	216
	Decks	216
	Drain & Sewer Services	216
	Electrical Panels & Wiring	216
	Flooring	216
	Gutter Guards	216
	Heat Pumps	216
	HVAC	216
	Kitchen Remodeling	216
	Landscaping	216
	Roofing	216
	Siding	216
	Stair Lifts	216
	Walk in Showers	216
	Walk in Tubs	216
	Windows Replacement	216
	Total	3888

Our paginated report in Power BI Report Builder enables users to identify the states in which exists out of area contractors. Out of area contractors means that there isn't a contractor to do the work and therefore there is a potential lead that can't find a company. With that users can to catch more contractors and try to sell the leads to this contractors.

Power BI Report Builder Paginated Report 3

Lead	Sum of Lead Revenue
'- Wallace Close	330
	330
.Charlotte fidler	247.5
	247.5
.mj wheat	247.5
	247.5
A a	247.5
	247.5
A davis	247.5
	247.5
A Gilbertson	300
	300
A Harris	247.5
	247.5
A Jesmote	247.5
	247.5
A Joyce	247.5
	247.5
A m	247.5
	247.5
A Palcko	247.5
	247.5
A Romo	247.5
	247.5
A Stevens	247.5
	247.5
Aaron Budge	247.5
	247.5
Aaron Burres	247.5
	247.5
Aaron Hibbard	247.5
	247.5
Aaron Jablonowski	330
	330
Aaron Major	247.5
	247.5

Our paginated report in Power BI Report Builder enables users to see a list of all of ours leads and the corresponding revenue. This is a powerful information for a company, to see the “product” and the revenue that they are making from each one.

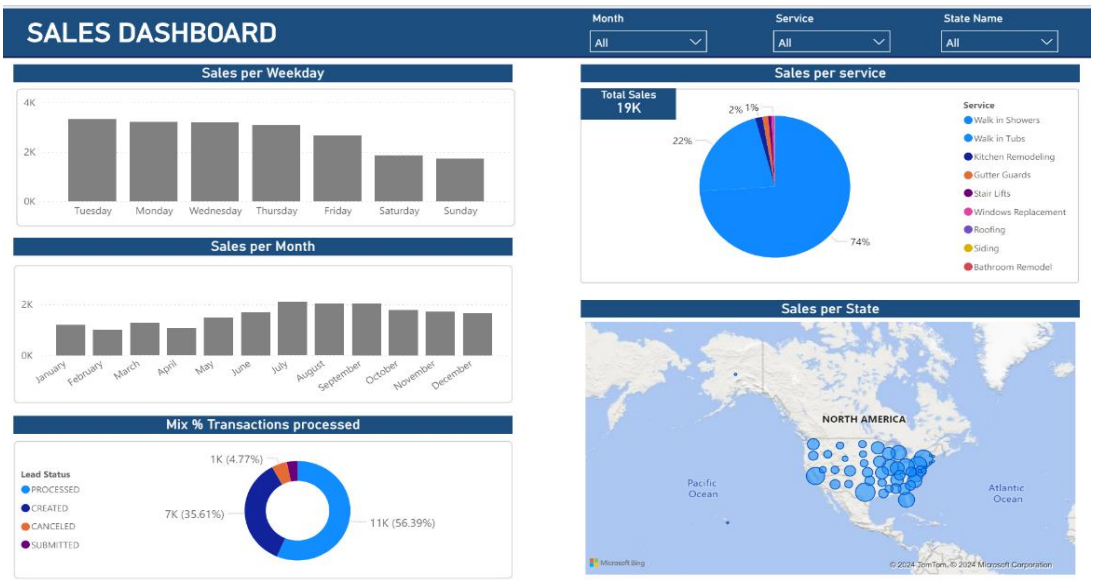
DASHBOARDS

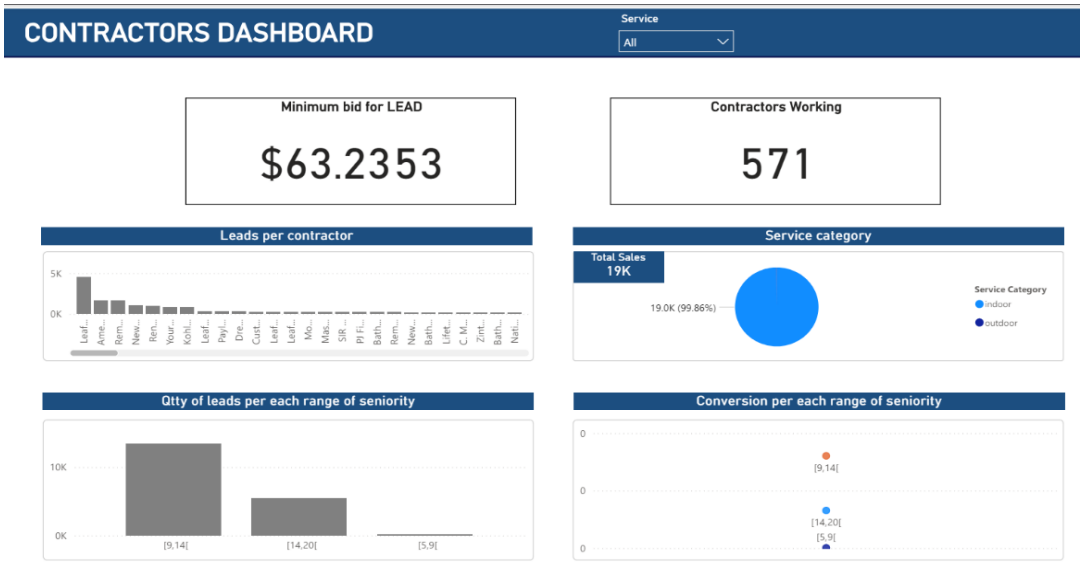
PURPOSE

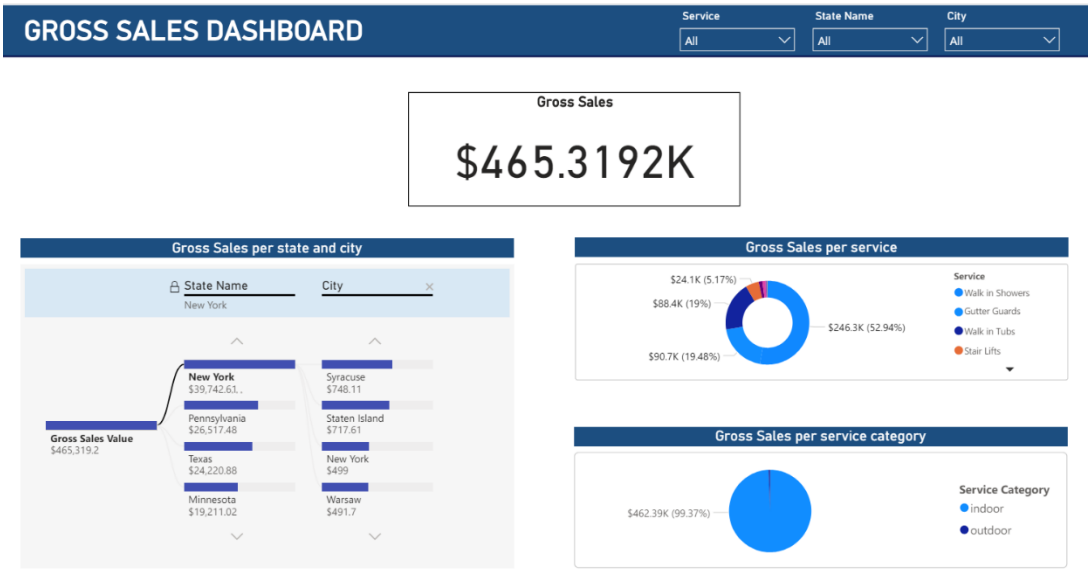
The objective of this report is to provide a comprehensive overview of our sales performance, detailed insights into contractor efficacy and bidding, and a comparative analysis of economic indicators and sales metrics by state. The sales dashboard offers granular visibility into sales trends by month and weekday. The contractor dashboard highlights sales per contractor, the minimum bid for leads, and performance across different seniority ranges, giving a clear view of contractor efficiency and lead acquisition costs. The gross sales dashboard presents total gross sales and breaks down sales by state and city, as well as by service and service category, allowing for interactive exploration of the data. The state dashboard compares each state's GDP in 2022 with sales volume, and analyzes average lead prices and profits, providing a strategic understanding of market dynamics. The profit dashboard gives insights into the profitability of leads by contractor and seniority range, with key metrics on total and average lead profit. The date dashboard provides important information about profitability patterns by quarter, day type, and month.

This report will enable the Board to effectively track and monitor the company's performance and growth, ensuring data-driven decision-making and strategic planning.

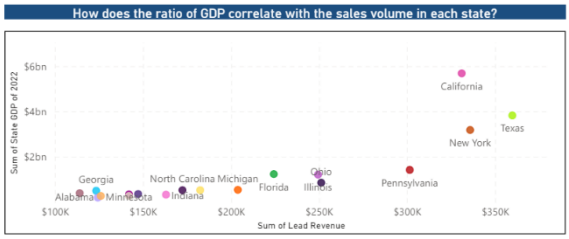
PAGES OVERVIEW

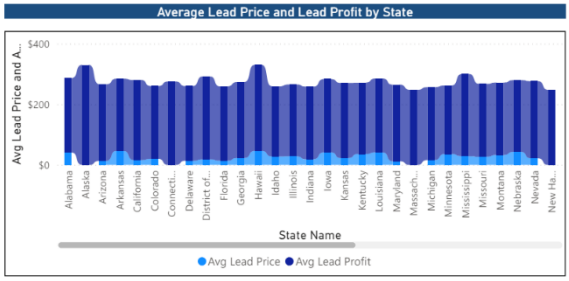

SALES DASHBOARD
Month
All
Service
All
State Name
All
Sales per Weekday
Tuesday
Monday
Wednesday
Thursday
Friday
Saturday
Sunday
Sales per service
Total Sales
19K
22%
2% 1%
74%
Service
Walk in Showers
Walk in Tubs
Kitchen Remodeling
Gutter Guards
Stair Lifts
Windows Replacement
Roofing
Siding
Bathroom Remodel
Sales per Month
January
February
March
April
May
June
July
August
September
October
November
December
Sales per State
NORTH AMERICA
Pacific Ocean
Atlantic Ocean
Mix % Transactions processed
Lead Status
PROCESSED
CREATED
CANCELED
SUBMITTED
1K (4.77%)
7K (35.61%)
11K (56.39%)

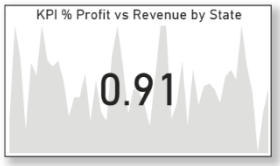

CONTRACTORS DASHBOARD
Service
All
Minimum bid for LEAD
$63.2353
Contractors Working
571
Leads per contractor
Service category
Total Sales
19K
19.0K (99.86%)
Service Category
indoor
outdoor
Qtty of leads per each range of seniority
[9,14[
[14,20[
[5,9[
Conversion per each range of seniority


GROSS SALES DASHBOARD
Service
All
State Name
All
City
All
Gross Sales
$465.3192K
Gross Sales per state and city
State Name
New York
City
Gross Sales Value
$465,319.2
New York
$39,742.61..
Pennsylvania
$26,517.48
Texas
$24,220.88
Minnesota
$19,211.02
Syracuse
$748.11
Staten Island
$717.61
New York
$499
Warsaw
$491.7
Gross Sales per service
$24.1K (5.17%)
$88.4K (19%)
$90.7K (19.48%)
$246.3K (52.94%)
Service
Walk in Showers
Gutter Guards
Walk in Tubs
Stair Lifts
Gross Sales per service category
$462.39K (99.37%)
Service Category
indoor
outdoor

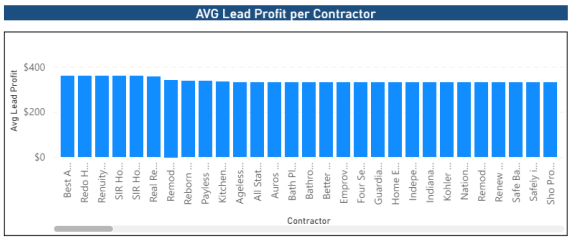
STATES DASHBOARD

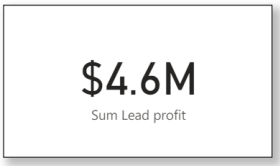


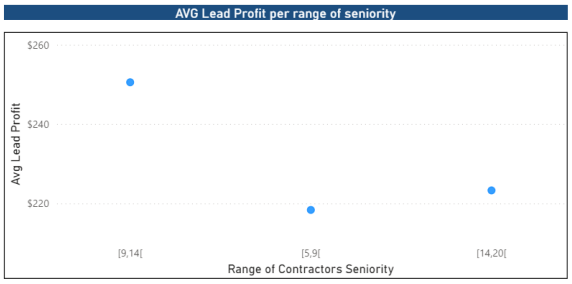


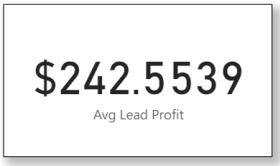


PROFIT DASHBOARD

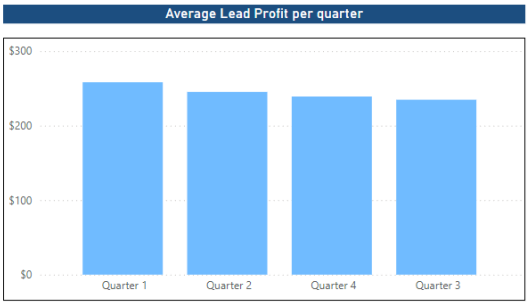


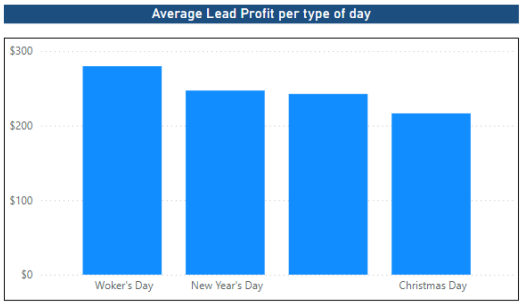


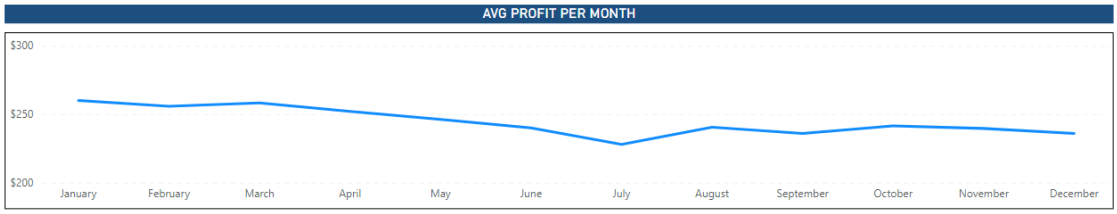




DATE DASHBOARD







Quickly explanation of the different pages of the two dashboards:

SCORECARD overview

The first sheet of our Power BI report features a clear and user-friendly entry point, with two fast and direct navigation buttons to access the subsequent pages.

SALES DASHBOARD overview

In this dashboard, we created **two stacked column charts** that help us read the **sales trend across weekdays and months**. Visualizing these trends enables the company to allocate resources more efficiently, ensuring we meet demand patterns accurately.

We also incorporated a **donut chart** to provide insights into the **distribution and outcomes of the majority of our leads**. This visualization helps us understand at which stages most leads are successful or fall off, allowing us to identify critical points where additional efforts or interventions may be needed to improve lead conversion rates.

On the right side of the dashboard, a **pie chart segments sales by service type**. This chart allows us to see which services are the most and least sold, providing valuable information for resource allocation and strategic planning. By identifying high-demand services, we can ensure we are adequately prepared to continue delivering these services effectively.

Additionally, we have a **filled map** that displays **sales distribution across states**. The size of the bubbles on the map corresponds to the sales volume in each state, giving a clear visual representation of geographical sales performance. This helps in identifying key markets and regions that may need more focus or potential expansion.

At the top of the sheet, there are **three important slicers** for filtering the data by **month, service, and state**. These slicers allow users to segment their analysis, enabling a more detailed examination of specific time periods, service types, or geographic areas. This level of detailed filtering supports more targeted decision-making and strategic planning.

Overall, this dashboard provides a comprehensive tool for monitoring and analyzing sales performance. By leveraging these visualizations, the company can gain actionable insights, optimize resource allocation, and improve overall operational efficiency.

With the Sales Dashboard we were able to give answer to the following questions:

- What were the company's top-selling services, categorized by type, city, and monthly sales?
- Which day of the week, and month of the year the company experienced the highest and lowest lead sales in the past year?
- What percentage of users opt not to complete the questionnaire and instead close the tab prematurely in different services?

CONTRACTORS DASHBOARD

In this contractors dashboard, we have **two prominent cards** that display key metrics: **the minimum bid for a lead and the total number of contractors currently working**. These data points are crucial for the company to understand resource availability and the baseline cost for generating leads, which ultimately influences service provision.

We also included **two stacked column charts**. The first chart shows **sales per contractor**, allowing the company to monitor individual contractor performance. This insight helps identify contractors who may need additional support or incentives to improve their sales. The second stacked column chart **segments sales by seniority range**, providing an understanding of which groups of contractors are generating the most sales. This information is valuable for workforce planning and targeted training initiatives.

On the right side of the dashboard, a **pie chart segments sales by service category**. This visualization highlights the distribution of sales across different service types, demonstrating a preference for contractors specializing in indoor services. This insight can guide recruitment and training efforts to focus on high-demand service areas.

Lastly, we included a **scatter chart** that illustrates **conversion rates across different seniority ranges**. This indicator is critical for understanding which groups of contractors are the most effective at closing sales, allowing for more informed decisions on contractor development and resource allocation.

At the top of the dashboard, a **slicer** allows users to filter data by **service type**, enabling a detailed view of specific service categories across the various visualizations. This functionality enhances the dashboard's flexibility and usability, supporting more granular analysis and strategic planning.

Overall, this contractors dashboard provides comprehensive insights into contractor performance, helping the company optimize its contractor management strategies, improve sales effectiveness, and allocate resources more efficiently.

GROSS SALES Dashboard

The gross sales dashboard provides a comprehensive view of our total sales performance. It features a **card** displaying the **total gross sales**, offering a quick snapshot of overall revenue.

A **dynamic tree map** breaks down gross sales **by state and further into cities**, allowing users to explore the data interactively and gain insights into regional performance. This interactive visualization helps identify high-performing areas and potential growth opportunities.

On the right side, the dashboard includes a **donut chart** showing gross **sales per service**, providing a clear view of which services contribute most to our revenue.

Additionally, there is a **donut chart depicting gross sales by service category**, helping to identify trends and prioritize resources accordingly. These visualizations together offer a detailed and dynamic analysis of our sales distribution, enabling more informed decision-making and strategic planning.

With the Gross Sales Dashboard we were able to give answer to the following question:

- What were the highest and lowest gross sales amounts monthly, categorized by state, city, services and service category?

STATES DASHBOARD

In the States dashboard, we feature several key visualizations to provide deep insights into our sales performance across different states. We plot a **scatter chart** that shows the **ratio of GDP per state compared to the sales volume**, serving as a valuable indicator of the quality of life and the volume of services provided in each state. By comparing GDP and sales, we can identify states with high economic activity and potential for growth.

Additionally, we have a **ribbon chart** that provides detailed information on **the average lead price and lead profit by state**. This chart helps us understand pricing

trends and profitability across different regions, enabling us to identify which states offer the highest returns on our leads.

We also include **two KPIs** that measure critical profit indicators, offering quick insights into the company's financial health and profitability. Having detailed information on profit metrics prepares the company to make informed decisions and strategic business calls

Overall, the States dashboard offers comprehensive insights into regional sales performance and profitability, helping the company allocate resources effectively, identify growth opportunities, and make data-driven decisions to enhance overall business performance across their territory.

With the States Dashboard we were able to give answer to the following question:

- How does the ratio of GDP correlate with the sales volume in each state?

PROFIT DASHBOARD

The profit dashboard provides crucial insights into the profitability of our leads. It displays the **average lead profit per contractor** and the **average lead profit by seniority range**, offering a detailed analysis of which contractors and seniority groups are most financially beneficial. This analysis helps identify top-performing contractors and understand the profitability dynamics across different levels of experience.

On the right side, **two cards** show key financial metrics: the **total lead profit** and the **average lead profit**. These metrics provide a quick overview of overall profitability and the average earnings per lead, helping to gauge the effectiveness of our sales and lead generation strategies.

Together, these elements of the profit dashboard enable the company to make informed decisions about resource allocation, contractor incentives, and strategic planning to maximize profitability.

With the Profit Dashboard we were able to give answer to the following question:

- What is the list of contractors, their seniority levels, and the average profit we make from selling each lead to these contractors?

DATE DASHBOARD

Lastly, we have the Date dashboard, which begins with a comprehensive view of **average lead profit per quarter and average lead profit by type of**

day. This provides critical insights into how profitability varies across different times of the year and different days of the week, helping to identify patterns and trends that can inform strategic planning and operational adjustments.

Additionally, the dashboard features a **line chart** that tracks **average profit per month**, allowing us to observe monthly fluctuations and trends in profitability over time. This detailed temporal analysis helps in understanding seasonal impacts on sales and identifying the most and least profitable periods, which is essential for optimizing marketing and operational efforts throughout the year.

8. Critical assessment

During the execution of our Business Intelligence I and II project, the group encountered several challenges and gained significant insights that greatly contributed to our professional and academic growth.

Firstly, we had to redo all the work from the previous semester's BI I project. In the first semester, we identified errors in the data, which forced us to delete many records due to duplications caused by poor initial data extraction. This critical review and data sources correction resulted in a substantial improvement: we increased our fact table from just 280 rows to a robust 19,000 rows. This experience underlined the importance of ensuring data quality and integrity from the very beginning of the BI process.

Furthermore, we faced significant challenges related to team dynamics. We started the project with four members and, due to various circumstances, ended up with only two. This unexpected situation forced us to develop skills in managing people and setting priorities. We learned to distribute tasks more efficiently and to maintain motivation and concentration.

Technically, all BI project brought an evolution in our understanding and application of BI tools. While in the first semester we focused on building the data warehouse, a task more oriented towards data engineering, this time we had the opportunity to create dashboards, paginated reports and observe the practical application of data in generating useful information, this time more business analytics work. This transformation of data into actionable information highlighted the importance of data visualization in making informed decisions.

In addition, this experience has allowed us to understand the various potential problems that can arise when working with data. Data isn’t always perfectly formatted or structured and there are often gaps in information, data deficiencies and errors. We had to learn how to deal with these situations and find the best ways to overcome them.

Moreover, it was extremely rewarding to realize that the dashboards and reports we created could be used to improve processes and support daily decision-making in organizations. Knowing that our work contributes to generating real, tangible value for data users is undoubtedly one of the greatest rewards for all the effort invested in the project.

9. Conclusion

The creation and implementation of our Power BI dashboards has provided the company with important practical knowledge and operational advantages.

Here are the main conclusions from a business point of view:

- User-Friendly navigation and quick access:

The SCORECARD overview offers a clear and intuitive entry point with quick navigation buttons.

- Resource allocation based on sales trends:

The Sales Dashboard allows to visualize sales trends across weekdays and months. This enables the company to allocate resources more efficiently, ensuring we meet demand patterns.

- Improve Lead Conversion rates:

The Sales Dashboard help us understand at which stages most leads are successful or fall off, with that we can identify critical points for intervention and create some automate e-mails to remember persons the importance of finishing the questionnaire.

- Geographical Sales insights:

It is very important identifying key markets and regions that may need more focus or potential expansions, with that we can target our efforts effectively and explore new growth opportunities. In other hand, we can keep pushing the countries with the higher sales values.

- Contractor performance management:

The contractor dashboard provides insights on sales per contractor, and we can see some correlations between the seniority and the sales. In addition, each contractor buys leads from us with different values, so we should improve our strategy and try to sell the lead with a higher rate and, therefore, get more revenue.

- Service insights:

With some graphs we can see a distribution of sales by different services, demonstrating a greater preference for “Walk in Showers”. So, this gives us some insights for interacting with new contractors and improving training efforts to focus on high-demand areas. From another perspective, we should check if the other services with lower preference are being executed with quality, in order to see customer satisfaction.

- Economic and sales correlation:

The STATES DASHBOARD's scatter chart comparing GDP per state to sales volume helps us understand the correlation between economic activity and sales. This allows for more informed decisions about market focus and potential expansion areas.

- Temporal profit trends:

The DATE DASHBOARD gives us insights about the seasonal impacts on sales. This helps optimize marketing and operational efforts, ensuring we capitalize on the most profitable periods.

Overall, either the dashboards or the paginated reports enable the organization to monitor, analyze and act upon various aspects of the business. By leveraging these detailed visualizations, the company can make more informed decisions, improve operational efficiency and optimize business outcomes.