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Contents

Abstract	7
Introduction	8
Chapter 1 Internship Environment: EY Tunisia	9
1.1 Presentation of the Company	9
1.2 Key Figures	9
1.3 Corporate Values and Culture	9
1.4 EY Tunisia Overview	9
1.5 Conclusion	10
Chapter 2 Project Framework: Context, Methodology, and Technology	11
2.1 Project Context	11
2.1.1 Business Problem (Problematique)	11
2.1.2 Use Case: From Reactive to Proactive Sales Management	11
2.1.3 The Proposed Solution: An Integrated BI Framework	11
2.1.4 Use Case Diagram	11
2.2 Requirements and Security	12
2.2.1 Functional and Non-Functional Requirements	12
2.2.2 Multi-Layered Data Security Strategy	13
2.3 Project Management Methodology	14
2.3.1 The Agile Scrum Framework	14
2.3.2 Project Planning and Tracking	14
2.4 Technical Environment and Tools	16
Chapter 3 Data Integration and Warehousing	18
3.1 Sprints 1-4: The Complete ETL Process with SSIS	18
3.1.1 Lead Entity Migration (Sprint 1)	18
3.1.2 Account and Contact Migration (Sprint 2)	20
3.1.3 Product, Opportunity, and Quote Migration (Sprint 3)	25
3.1.4 Quote Lines and Sales Order Migration (Sprint 4)	39
3.2 Sprint 5: Data Warehouse Implementation	46
3.2.1 Architecture: The Constellation Schema	46
3.2.2 Dimension and Fact Tables	47
Chapter 4 Predictive Modeling for Quote Approval	49
4.1 Objective and Approach	49
4.2 Model Development and Comparison	49
4.2.1 Baseline Model: RandomForest Classifier	49
4.2.2 Champion Model: LightGBM (LGBM) Classifier	50

4.3	Conclusion	50
Chapter 5	Sales Intelligence: The Power BI Dashboards	51
5.1	KPI Strategy and Dictionary	51
5.2	Dashboard Implementation	53
5.2.1	The Sales Intelligence Hub	53
5.2.2	Sales Performance and Funnel Dashboards	54
5.2.3	Predictive Model Performance Dashboard	56
Chapter 6	The CRM BI Web Interface: A Centralized Hub	58
6.1	User Onboarding and Access	58
6.2	Core Application Features	61
6.2.1	Data Exploration ('Entities' Tab)	61
6.2.2	On-Demand ETL ('Data Integration' Tab)	63
6.2.3	Real-Time Predictions ('Predict' Tab)	64
Chapter 7	General Conclusion and Perspectives	66
7.1	Summary of Achievements	66
7.2	Challenges and Lessons Learned	66
7.3	Perspectives and Strategic Vision	66
Webography		67

List of Figures

1	High-Level Use Case Diagram for the CRM System	12
2	Multi-Layered Security Approach	13
3	The Agile Methodology Cycle	14
4	Project Gantt Chart for High-Level Planning	15
5	Azure DevOps Project Overview Dashboard for Real-Time Tracking	15
6	SSIS Data Flow: Initial Lead Data Cleaning	18
7	Enriched Lead Table After SQL Transformation	19
8	Column Mapping for Lead Migration	19
9	SSIS Data Flow: Lead Migration to CRM	20
10	Verification of Migrated Leads in Dynamics 365	20
11	SSIS Data Flow: Account Migration	21
12	Migrated Accounts in Dynamics 365	22
13	Derived Column for Contact Parent Entity Type	23
14	Parent Account Lookup Configuration for Contacts	24
15	SSIS Data Flow: Contact Migration	24
16	Verification of Migrated Contacts in CRM	25
17	SSIS Data Flow for Product Migration	26
18	Derived Column Transformation for Default Product Units	27
19	Product Lookup Transformation for Opportunity Lines	27
20	Field Mapping for Product Migration Destination	28
21	Verification of Migrated Products in Dynamics 365	28
22	SSIS Data Flow for Cleaning Opportunity Data	29
23	Result of Data Cleaning Transformations	29
24	Final SSIS Data Flow for Loading Opportunities	30
25	Derived Column Transformation for Opportunity Status	31
26	Field Mapping for Opportunity Destination	31
27	Verification of Migrated Opportunities in Dynamics 365	32
28	Opportunity Lines: Data Flow	33
29	Opportunity Lines: Source Configuration	34
30	Opportunity Lines: Destination Configuration	34
31	Opportunity Lines: Full Package View	35
32	Opportunity Lines: Verification in CRM	35
33	Loading Primary Quote Data to Staging	36
34	Loading Secondary Quote Data to Staging	36
35	Main SSIS Data Flow for Merging and Loading Quotes	37
36	Derived Column Transformation for Quote Customer Type	37
37	Field Mapping for Quote Destination	38
38	Verification of Migrated Quotes in Dynamics 365	39
39	Complete SSIS Data Flow for Quote Line Migration	40
40	Verification of Migrated Quote Lines in Dynamics 365	41

41	SSIS Data Flow: Sales Order Migration	42
42	Verification of Migrated Sales Orders in CRM	43
43	Sales Order Lines: Data Flow	44
44	Sales Order Lines: Source Configuration	44
45	Sales Order Lines: Destination Configuration	45
46	Sales Order Lines: Full Package View	45
47	Sales Order Lines: Verification in CRM	46
48	The Constellation Schema of the CRM Data Warehouse	47
49	Implemented DWH Tables in SQL Server	48
50	Classification Report and Confusion Matrix for the Baseline RandomForest Model	49
51	Final Comparison of Quote Approval Model Performance	50
52	KPI Dictionary: Commercial Performance Monitoring	51
53	KPI Dictionary: Marketing & Sales Funnel Analysis	52
54	KPI Dictionary: Predictive Model Monitoring	52
55	The Sales Intelligence Hub Home Page	53
56	Hub Page with the KPI Dictionary Pop-up	54
57	Sales Performance Analysis Dashboard	55
58	Sales Performance Analysis Dashboard Details	55
59	Sales Funnel and Conversion Analysis Dashboard	56
60	Predictive Model Performance and Explainability Dashboard	57
61	Secure Login Page for the BI Interface	58
62	The Welcome Page for New Users	59
63	User Guide - Part 1: Quick Start	59
64	User Guide - Part 2: Key Features	60
65	User Guide - Part 3: Help and Support	60
66	Navigation Menu for Entity Selection	61
67	Quotes Management List with Filtering	62
68	Detailed View of a Single Quote	62
69	ETL Control Panel for On-Demand Package Execution	63
70	Real-Time Feedback after a Successful Package Execution	63
71	Interactive Form for the Quote Approval Prediction Model	64
72	Real-Time Prediction Result with Confidence Score	64
73	Live LGBM Model Performance Metrics in the BI Interface	65

Abstract

This project addresses the challenge of transforming underutilized CRM data into a strategic asset for EY. The core problem lies in siloed data that is difficult for non-technical users to access, analyze, and use for proactive decision-making.

To solve this, a comprehensive, end-to-end Business Intelligence solution was developed. This solution integrates multiple components into a single, cohesive framework. The backend consists of a robust ETL pipeline, built with SSIS, to extract, clean, and load data from Dynamics 365 into a structured constellation-schema Data Warehouse. The analytics layer features a high-accuracy machine learning model (LGBM classifier, 80.04% accuracy) to predict quote approval and a suite of interactive Power BI dashboards for performance monitoring.

All these components are unified in a custom-built ASP.NET Core web application. This central interface provides secure access and empowers business users with self-service capabilities, including on-demand ETL execution, data exploration, dashboard visualization, and real-time predictions. The project successfully demonstrates a scalable model for data democratization and data-driven decision-making within the enterprise.

Introduction

In today's data-driven economy, successful customer relationship management (CRM) is critical for any organization aiming to remain competitive. While CRM systems like Microsoft Dynamics 365 are powerful tools for managing sales, marketing, and customer service processes, they also generate vast, complex datasets that often obscure valuable insights. The core challenge this project addresses is transforming this raw data into actionable insights for strategic decision-making.

This report details the development of a comprehensive Business Intelligence (BI) solution for EY Tunisia, designed to optimize CRM performance analysis. The project follows an **Agile methodology**, specifically Scrum, breaking down the work into iterative sprints to deliver value incrementally. This approach was chosen to effectively manage the project's complexity, from data integration to predictive modeling.

The key deliverables of this project include:

- **A robust ETL (Extract, Transform, Load) pipeline** built with SQL Server Integration Services (SSIS) to clean, transform, and integrate data from various sources into a unified data warehouse.
- **An accurate predictive model for quote approval**, developed using a comparative machine learning approach to select the best algorithm.
- **Interactive dashboards and reports** in Power BI, designed to track Key Performance Indicators (KPIs) and provide actionable insights to both technical and non-technical stakeholders.
- **A centralized web interface** that unifies all project components, providing tools for data exploration, on-demand ETL management, and real-time predictions.

Ultimately, this project aimed to create a scalable BI framework that addresses immediate business needs at EY and serves as a template for future analytical initiatives. This report will walk through the project's context, the Agile management approach, the technical environment, and a detailed account of the implementation sprints.

Chapter 1: Internship Environment: EY Tunisia

This chapter provides the professional context for the project by introducing the host company, EY (Ernst & Young). It details the firm's global scale, core values, and specific operations in Tunisia, setting the stage for the business challenges addressed by this internship.

1.1 Presentation of the Company

In today's constantly evolving global economy, organizations seek trusted partners to support their transformation and long-term growth. EY stands out as one of the world's leading professional services firms in assurance, consulting, tax, law, and transaction services. This internship was conducted within this dynamic context of excellence, innovation, and responsibility.

1.2 Key Figures

- 400,000 professionals worldwide
- 750 offices across the globe
- 152 countries

These figures highlight EY's extensive global reach and significant operational scale, underscoring its position as a major player in professional services. The firm's presence across 152 countries enables it to serve a diverse international clientele and offer robust solutions adapted to various market needs.

1.3 Corporate Values and Culture

At the heart of EY's identity are its people—professionals who embody integrity, mutual respect, and team spirit. The company fosters dynamic teams driven by leadership, enthusiasm, and a shared vision of success. These core values are integral to EY's operational philosophy, promoting an environment of collaboration, ethical conduct, and continuous improvement. The emphasis on team spirit and leadership development ensures that employees are not only technically proficient but also excellent communicators and problem-solvers.

1.4 EY Tunisia Overview

EY Tunisia has maintained a local presence since 1987, establishing itself as one of the leading professional services firms in the country. With over 900 collaborators and 25 partners, EY Tunisia provides a wide range of services across multiple professions and has successfully supported businesses and public organizations for over three decades. Locally, EY Tunisia is recognized as the #1 Business Consulting Firm. This strong local foundation, combined with global best practices, allows EY Tunisia to deliver tailored and impactful solutions to its clients, contributing significantly to the national economy.

1.5 Conclusion

Through its strong global presence and decades of experience in Tunisia, EY demonstrates a robust organizational structure that combines technical excellence with operational efficiency. Its multidisciplinary service lines, supported by dynamic business services teams, reflect a firm committed to innovation and client satisfaction. This solid environment provided an ideal framework for a meaningful and enriching internship experience, grounding the project in real-world business needs.

Chapter 2: Project Framework: Context, Methodology, and Technology

This chapter outlines the project's strategic framework and technical foundation. It defines the business problem and use case, presents the proposed solution, details its requirements (including security), outlines the Agile methodology used for management, and presents the technology stack.

2.1 Project Context

2.1.1 Business Problem (Problematique)

Many organizations, including EY, collect vast amounts of customer data within their CRM systems. However, this data often remains siloed, unstructured, and difficult for business users to analyze effectively. This fragmentation impedes the derivation of actionable insights, leading to reactive decision-making, inefficient resource allocation, and a dependency on technical teams. The core challenge is to transform this underutilized data into a driver of CRM performance and business growth. This problem highlights a critical gap between data collection and data utilization, preventing organizations from fully leveraging their valuable customer information.

2.1.2 Use Case: From Reactive to Proactive Sales Management

To illustrate the problem and its solution, consider a sales manager evaluating a new quote. Without this solution, they rely on intuition, often discovering risks too late. With this solution, they can enter the quote into the BI interface, receive an instant risk score, analyze predictive factors, and intervene proactively to save the sale. This shifts the team from analyzing past failures to preventing future ones. This specific use case demonstrates the tangible benefits of the BI solution by enabling real-time, data-driven interventions that can significantly improve sales outcomes.

2.1.3 The Proposed Solution: An Integrated BI Framework

To address the stated problem, this project proposed the development of a comprehensive, end-to-end Business Intelligence solution. The goal was to create a single, unified framework that centralizes data, enables predictive analytics, and empowers business users with accessible, self-service tools. This integrated approach aims to break down data silos and democratize access to critical business insights, fostering a more informed and agile decision-making culture within EY.

2.1.4 Use Case Diagram

The following diagram illustrates the primary actors and their interactions with the system. It defines the main functionalities available to both administrative and business user roles. This visual representation provides a clear overview of how different users interact with the BI solution

and the key functions they can perform, such as managing ETL processes, viewing dashboards, or accessing predictive analytics.

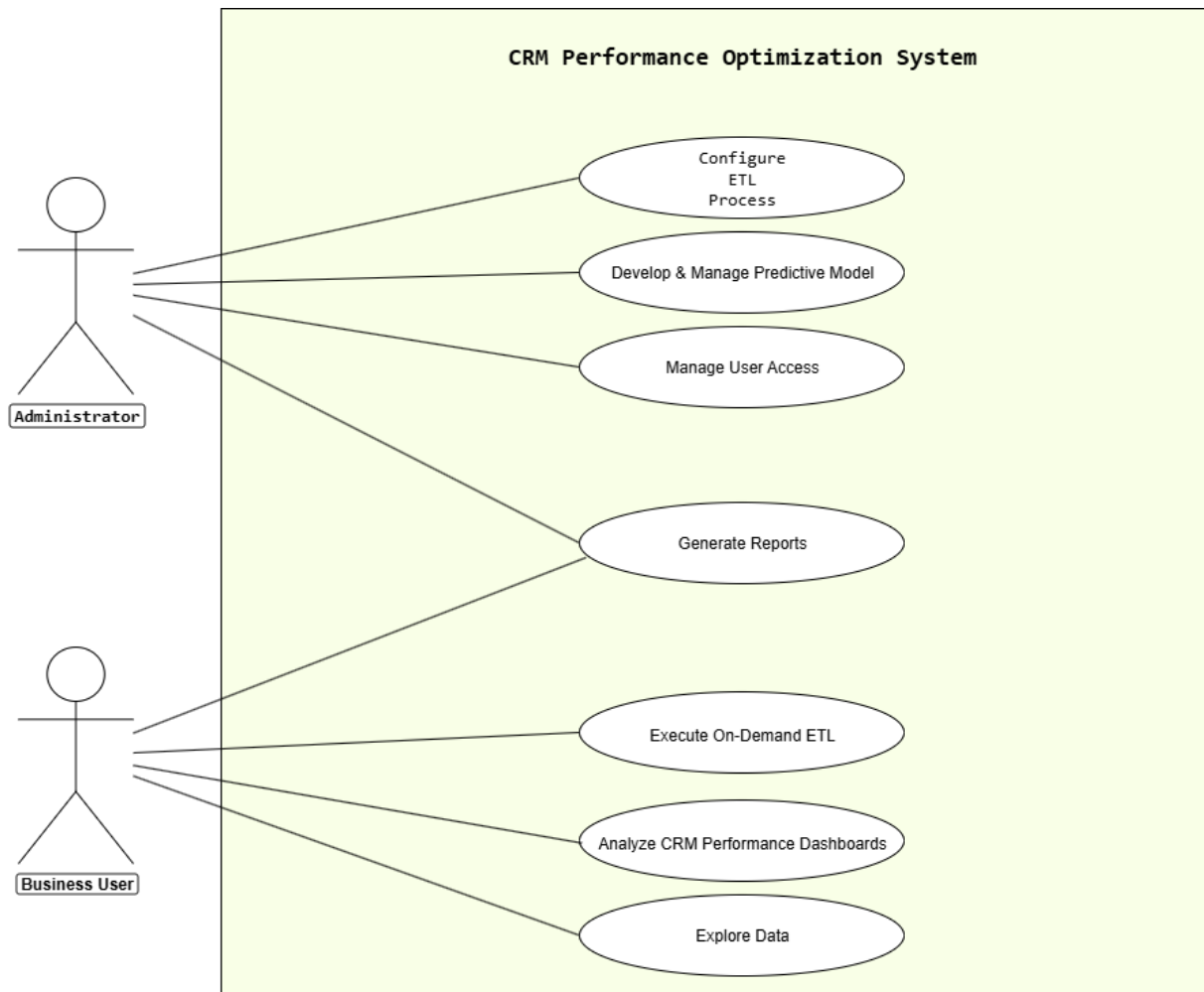


Figure 1: High-Level Use Case Diagram for the CRM System

2.2 Requirements and Security

2.2.1 Functional and Non-Functional Requirements

Functional: The solution must centralize data using a DWH and SSIS, generate insights via Power BI dashboards and predictive models, empower business users with a self-service interface for data exploration and management, and provide secure user authentication. These requirements ensure the system performs its intended tasks and delivers tangible business value.

Non-Functional: The system must be secure, performant, usable, maintainable, and scalable. These requirements address the quality attributes of the system, ensuring its reliability, efficiency, and adaptability for future growth and evolution.

2.2.2 Multi-Layered Data Security Strategy

To meet the security requirement, a robust, multi-layered data security strategy was implemented. This approach ensures protection at various points of interaction and data storage within the system.

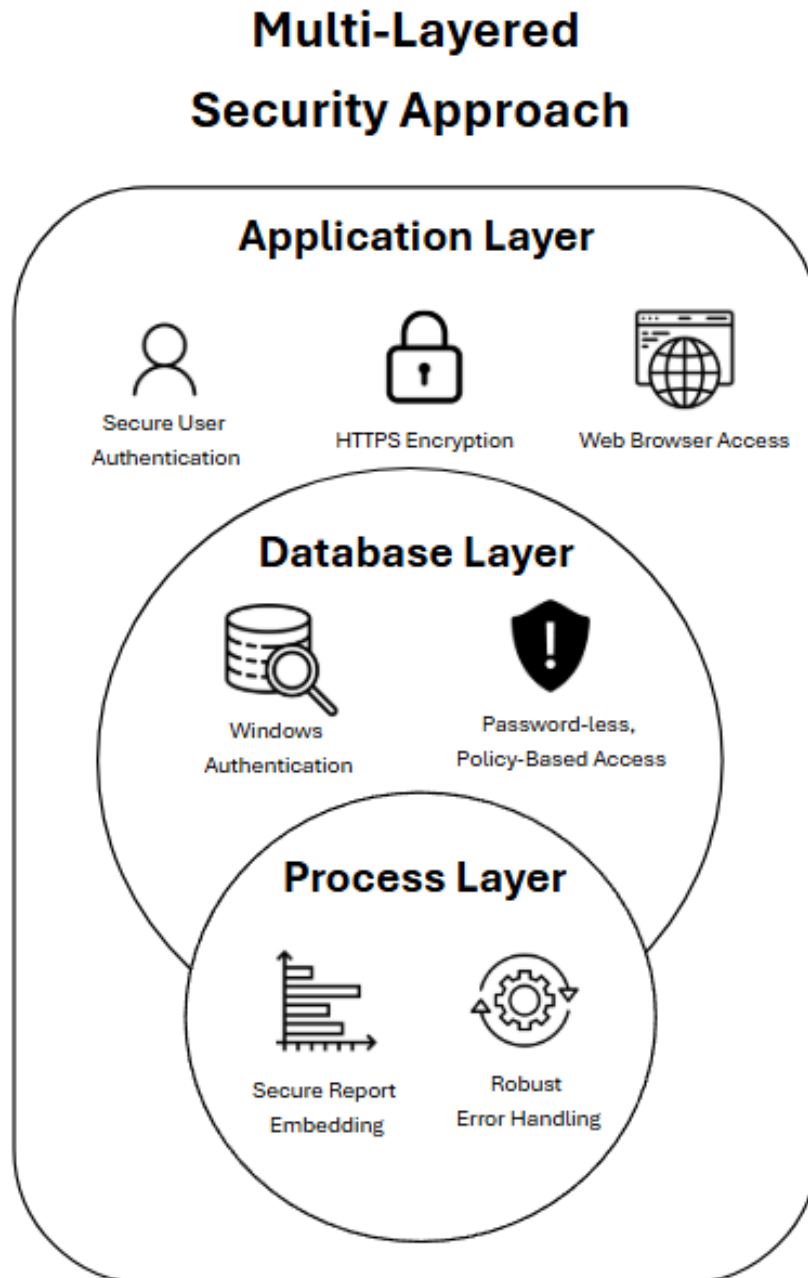


Figure 2: Multi-Layered Security Approach

- **Application Layer:** Secure user authentication controls access to the web interface, served over HTTPS. This prevents unauthorized access to the BI solution and encrypts data in transit.

- **Database Layer:** Windows Authentication is used for password-less, policy-based database access. This integrates with existing enterprise security protocols, simplifying management and strengthening access control.
- **Process Layer:** Power BI reports are embedded securely, and SSIS packages include robust error handling. This ensures that data access within reports is controlled and that data integration processes are resilient against failures and unauthorized modifications.

This comprehensive strategy minimizes vulnerabilities and protects sensitive CRM data throughout the entire BI ecosystem.

2.3 Project Management Methodology

2.3.1 The Agile Scrum Framework

An Agile methodology, specifically the Scrum framework, was chosen to guide the development. This iterative approach was well-suited for a complex project, allowing for flexibility and incremental delivery of value. Scrum's emphasis on adaptive planning, continuous improvement, and rapid response to change proved invaluable in managing the project's evolving requirements and technical challenges.

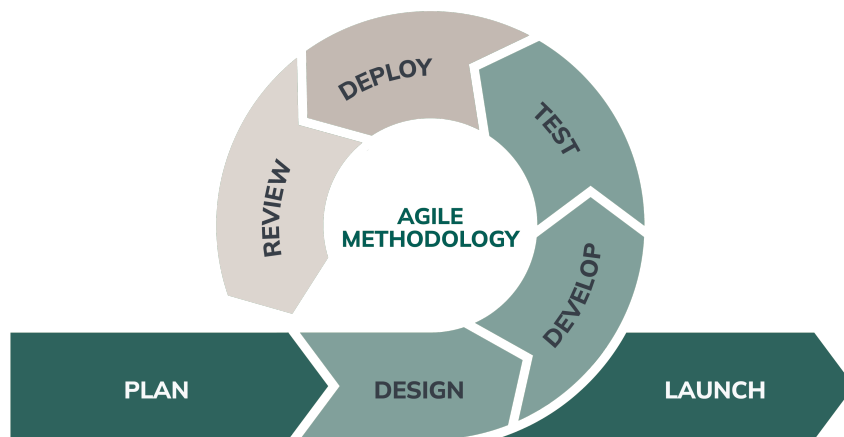


Figure 3: The Agile Methodology Cycle

2.3.2 Project Planning and Tracking

A Gantt chart was used at the outset for high-level planning. Azure DevOps served as the central tool for day-to-day project management, including backlog management, sprint planning, and progress tracking via Scrum boards. This dual approach allowed for both long-term strategic visualization and granular operational control, ensuring the project remained on schedule and within scope.

GANTT CHART – CRM BI PROJECT

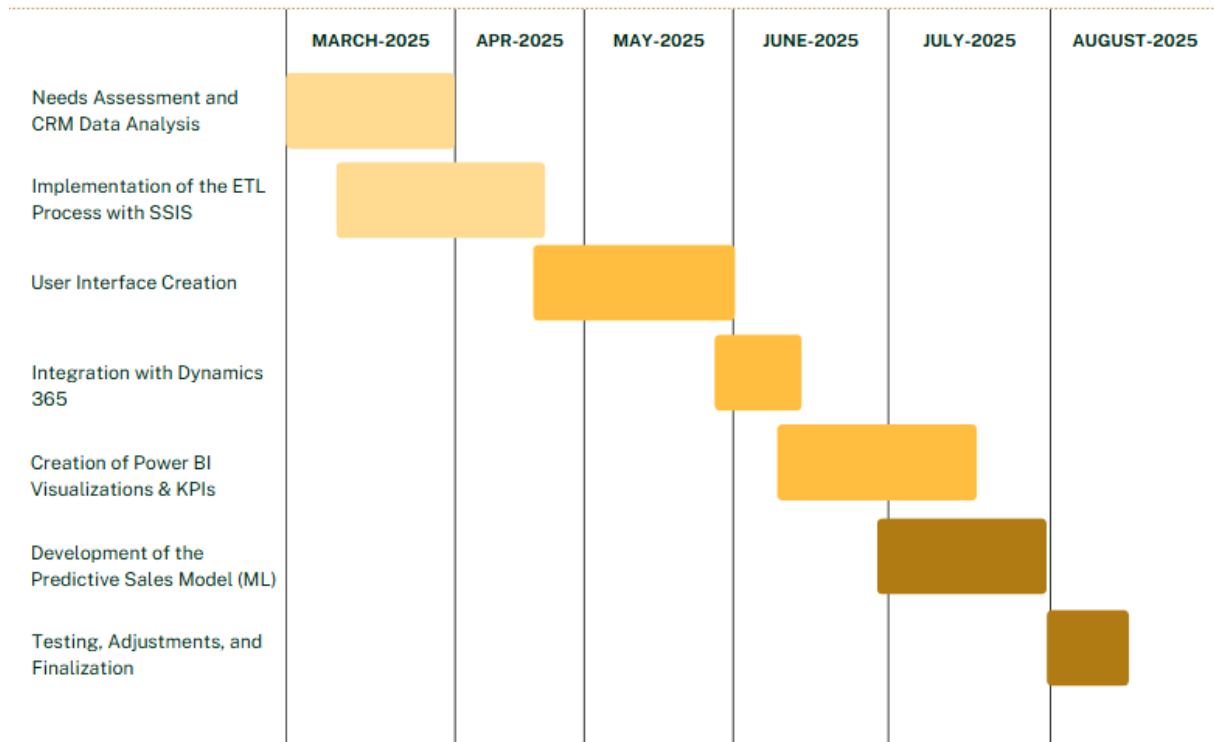


Figure 4: Project Gantt Chart for High-Level Planning

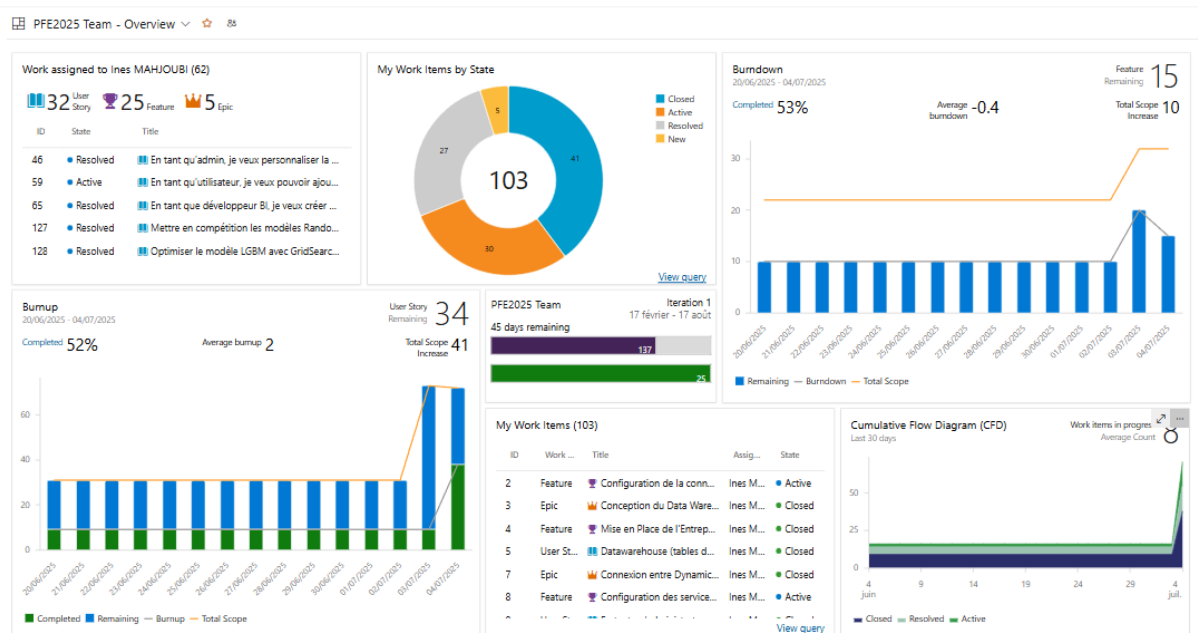


Figure 5: Azure DevOps Project Overview Dashboard for Real-Time Tracking

2.4 Technical Environment and Tools

The solution was built on the Microsoft technology stack, integrating a comprehensive suite of tools for every stage of the project. The core components are presented below, each playing a specific role in the end-to-end development of the Business Intelligence solution. This unified environment facilitated seamless integration and efficient development across all layers of the BI framework.



Microsoft Dynamics 365 Logo This is the foundational CRM system, serving as the primary source of raw customer and sales data.



Power Apps Logo Power Apps can be used for building custom applications that interact with Dynamics 365 and Dataverse, though its primary role here is context for the Microsoft ecosystem.



Dataverse Logo The underlying data platform for Dynamics 365 and Power Apps, providing a secure and scalable storage for business data.



SQL Server Management Studio (SSMS) Logo This tool was essential for managing SQL Server databases, including the Data Warehouse, and for writing and executing SQL queries.



SQL Server Integration Services (SSIS) Logo SSIS was utilized to develop the robust ETL pipelines, orchestrating the extraction, transformation, and loading of data from Dynamics 365 into the Data Warehouse.



KingswaySoft Logo KingswaySoft's SSIS Integration Toolkit provided specialized connectors to efficiently integrate with Microsoft Dynamics 365 and other platforms.



ASP.NET Core Logo This framework was used to build the custom web application that serves as the centralized user interface for the BI solution.



Power BI Logo Power BI was the chosen tool for developing interactive dashboards and reports, visualizing the insights derived from the Data Warehouse.



Python Logo Python, along with its rich libraries (e.g., scikit-learn, pandas), was used for developing and optimizing the machine learning models.



Azure DevOps Logo Azure DevOps was the central platform for project management, including source control, sprint planning, and continuous integration/delivery.

Chapter 3: Data Integration and Warehousing

This chapter details the foundational technical work of the project, combining the data integration sprints and the subsequent implementation of the Data Warehouse. This entire process formed the backend of the Business Intelligence (BI) solution.

3.1 Sprints 1-4: The Complete ETL Process with SSIS

Goal: Execute a series of dependent sprints to migrate and integrate all critical CRM entities, respecting their relationships to create a clean, unified dataset for the warehouse. Each step is documented below to provide full evidence of the work performed. These sprints collectively ensured that raw, disparate data from Dynamics 365 was transformed into a high-quality, consistent format suitable for analytical consumption.

3.1.1 Lead Entity Migration (Sprint 1)

The process began with Leads. Raw data was extracted, cleaned, enriched, and carefully mapped before being loaded into Dynamics 365. This initial sprint laid the groundwork for managing potential customer interactions effectively.

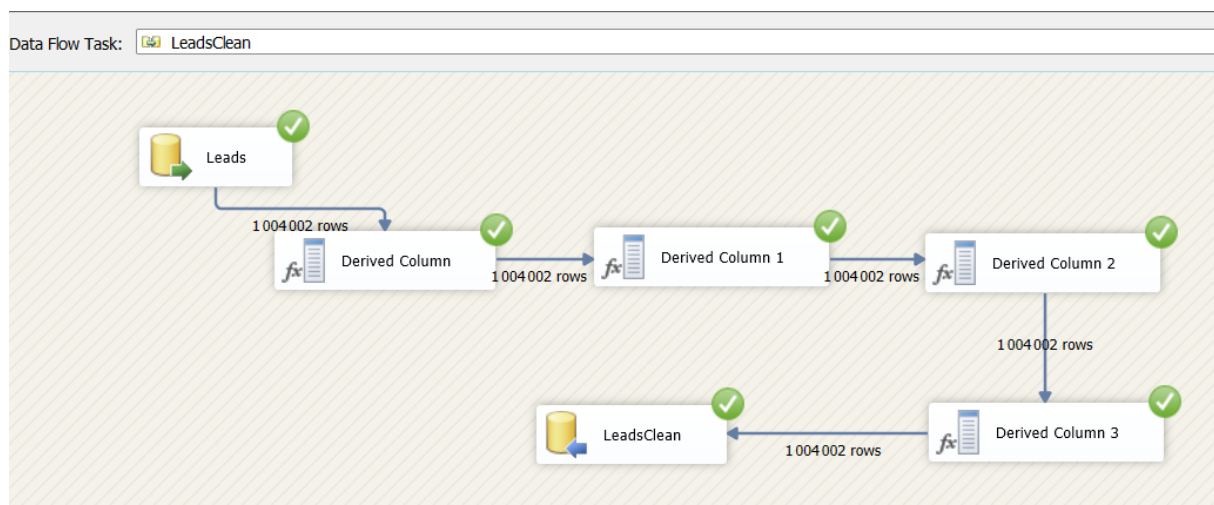


Figure 6: SSIS Data Flow: Initial Lead Data Cleaning

This SSIS data flow illustrates the initial stages of cleansing the raw lead data, including tasks like removing duplicates, standardizing formats, and correcting errors.

Revenue_Poten...	Last_Contact_D...	Full_Name_Clean	First_Name	Middle_Na...	Last_Na...	Status_Co...	State_Co...	Lead_Source_c...	Industry_co...
1626634.00	26/11/2023	James Contreras	James		Contreras	4	2	7	37
2595167.00	27/11/2024	Jean Mercado	Jean		Mercado	2	0	7	36
4299847.00	29/01/2025	Sheryl Smith	Sheryl		Smith	4	2	5	34
4735992.00	05/02/2024	Christopher Lowery	Christopher		Lowery	4	2	5	40
3266003.00	26/06/2023	Michael Jacobson	Michael		Jacobson	1	0	4	34
2544138.00	24/11/2023	David Miller	David		Miller	1	0	1	39
4131354.00	26/05/2023	Krystal Chandler	Krystal		Chandler	4	2	7	36
494576.00	09/05/2023	Justin Williams	Justin		Williams	1	0	3	39
515137.00	20/06/2023	Kendra Whitaker	Kendra		Whitaker	4	2	2	39
2308256.00	11/11/2024	Trevortkins	Trevortkins			1	0	5	39
3463896.00	08/03/2023	John Mccullough	John		Mccullo...	1	0	6	40

Figure 7: Enriched Lead Table After SQL Transformation

The enriched lead table showcases the results of SQL transformations applied to the data, adding calculated fields or consolidating information to make it more useful.

CDS/CRM Destination Editor - v24.1.1 (24.1.1.24301)

CDS/CRM Destination Component Editor
Specify how you want to write data into Dataverse, CDS (2.0), PowerApps, and Microsoft Dynamics 365 CE/CRM Server

General
Columns
Error Handling

☐ Hide Mapped Fields ☒ Hide Unmapped Fields Find:

Input Column	Target Field	Text Lookup	Option Value Mapping	Data Type	Unmap
Company_Name	companyname			nvarchar (100)	
Email	emailaddress1			nvarchar (100)	
Last_Contact_Date	estimatedclosedate			date	
First_Name	firstname			nvarchar (50)	
Industry_code	industrycode		☒ Yes	int	
Last_Name	lastname			nvarchar (50)	
Lead_Source_code	leadsourcecode		☒ Yes	int	
Phone_Number	mobilephone			nvarchar (50)	
Revenue_Potential	revenue			decimal	
State_Code	statecode		☒ Yes	int	
Status_Code	statuscode		☒ Yes	int	

Refresh Metadata Map Unmapped Fields Clear All Mappings OK Cancel

Figure 8: Column Mapping for Lead Migration

This figure demonstrates the precise mapping of source columns to destination columns in Dynamics 365, ensuring that each piece of data is placed correctly within the CRM system.

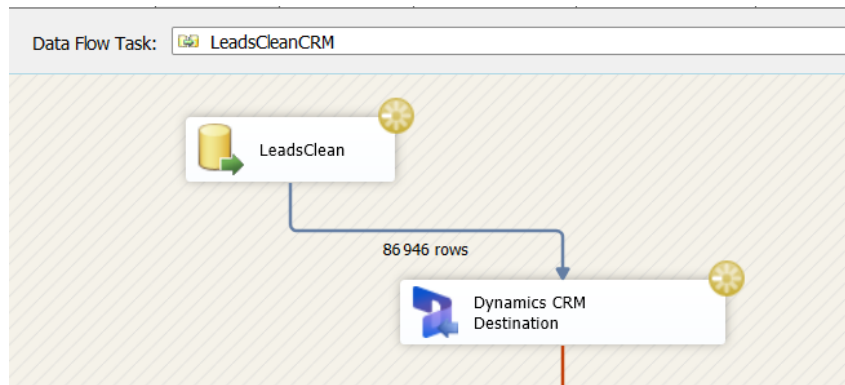


Figure 9: SSIS Data Flow: Lead Migration to CRM

This SSIS data flow represents the complete process of migrating cleaned and transformed lead data directly into the Dynamics 365 CRM, marking the culmination of Sprint 1’s efforts.

Prénom	Nom	Création le	Secteur d'a...	Raison du...	Statut	Source du p...	Revenu a...	Téléphone	E-mail	Nom de la société	Date de ferme...
Andrew	Frost	28/04/2025 15:51	Manufacturing	New	Ouvrte	Website	2 045 616.00	+1-921-954-418...	christopher80@yahoo.com	:	19/01/2024
Misty	Stephenson	28/04/2025 15:45	Technology	New	Ouvrte	Event	2 419 080.00	001-856-911-02...	carlyrygnet@topac.com	Aakus-Perez	19/01/2025
Jonathan	Smith	28/04/2025 15:31	Healthcare	Qualified	Indus	Email Campa...	112 812.00	698-054-0414	harveyrichard@yahoo.com	Aaxi, Hopkins and Johnson	16/09/2023
James	Jones	28/04/2025 15:31	Education	Contacted	Ouvrte	Cold Call	1 089 478.00	001-384-911-79...	michael80@white.org	Aasi, Whitaker and Hernandez	24/01/2025
Dana	Weaver	28/04/2025 15:24	Real Estate	Qualified	Indus	Cold Call	4 111 000.00	(213)664-0584x3...	jessicalhaine@smith.net	Abbott and Sons	11/07/2024
Cheryl	Vargas	28/04/2025 15:31	Retail	Qualified	Indus	Event	1 769 381.00	111.620.3381	wmiller@gmail.com	Abbott and Sons	07/05/2023
Sarah	Mills	28/04/2025 16:11	Retail	Contacted	Ouvrte	Website	1 472 290.00	(527)088-2055x1...	jwalker@blevins.info	Abbott and Sons	02/02/2024
Robert	Palmer	28/04/2025 15:24	Manufacturing	Qualified	Indus	Social Media	4 509 305.00	+1-902-415-577...	ccaramonia@hotmail.com	Abbott Group	08/11/2023
Jennifer	Hernandez	28/04/2025 15:31	Healthcare	New	Ouvrte	Website	1 970 462.00	-1115	summerjaguirre@adams.net	Abbott Group	05/08/2024
Clayton	Brown	28/04/2025 15:57	Manufacturing	Lost	Exclus	Website	1 517 541.00	(876)311-1647x6...	mathewmunoz@gmail.com	Abbott Group	15/05/2024
Luis	Osborne	28/04/2025 15:24	Real Estate	New	Ouvrte	Email Campa...	1 983 987.00	(604)530-7280x6...	robert58@campbell.net	Abbott Inc	10/06/2023
Justin	Jones	28/04/2025 15:57	Manufacturing	Contacted	Ouvrte	Website	3 867 218.00	(401)754-6821x6...	dommy32@yahoo.com	Abbott Inc	04/02/2025
Rhonda	Ferguson	28/04/2025 16:11	Healthcare	New	Ouvrte	Social Media	3 704 725.00	001-899-282-36...	asmith@herring.net	Abbott Inc	15/01/2024
Christopher	Soto	28/04/2025 15:19	Technology	Qualified	Indus	Advertisement	3 776 540.00	001-851-964-01...	ycdonnell@gmail.com	Abbott LLC	02/04/2023
Lisa	Fisher	28/04/2025 15:25	Education	New	Ouvrte	Event	4 064 999.00	927-125-1978x5...	rgonzalez@hotmail.com	Abbott LLC	21/02/2024
James	Buck	28/04/2025 15:30	Education	Lost	Exclus	Website	4 792 294.00	001-399-921-63...	wendy10@yahoo.com	Abbott LLC	15/05/2023
Margaret	Murray	28/04/2025 15:31	Retail	Qualified	Indus	Referral	4 340 540.00	001-866-794-99...	koehicks@gmail.com	Abbott LLC	11/04/2023
Eric	Santos	28/04/2025 15:31	Retail	Qualified	Indus	Advertisement	607 745.00	519-048-1849x3...	victoriabuch@coleman.com	Abbott LLC	03/09/2023
Corey	Cook	28/04/2025 15:38	Education	Contacted	Ouvrte	Referral	1 120 626.00	001-407-716-08...	william76@yahoo.com	Abbott LLC	11/05/2024
Daniel	Fox	28/04/2025 15:46	Finance	Contacted	Ouvrte	Event	2 733 382.00	-2697	sheppalmer@hotmail.com	Abbott LLC	03/05/2023
William	Hardy	28/04/2025 15:46	Real Estate	Qualified	Indus	Cold Call	3 568 494.00	(385)856-2658	brownamanda@clark.com	Abbott LLC	02/12/2024
Clayton	Smith	28/04/2025 15:46	Education	Contacted	Ouvrte	Cold Call	2 010 974.00	(817)528-7266x1...	carrie88@gmail.com	Abbott LLC	30/06/2023
Jennifer	Boone	28/04/2025 15:57	Finance	Lost	Exclus	Event	2 482 652.00	(411)027-0060x5...	margaret23@yahoo.com	Abbott LLC	17/06/2023
Robert	Jones	28/04/2025 16:03	Education	Qualified	Indus	Advertisement	2 323 258.00	+1-127-807-227...	rhill@yahoo.com	Abbott LLC	17/06/2023
Cameron	Moore	28/04/2025 16:03	Technology	Qualified	Indus	Advertisement	968 999.00	-960	franciscocourney@gmail.com	Abbott LLC	12/08/2023
David	Hicks	28/04/2025 16:10	Finance	Lost	Exclus	Advertisement	1 281 251.00	+1-440-814-643...	schmidtjenifer@simpson-shaw.c...	Abbott LLC	03/05/2023
Cindy	Sullivan	28/04/2025 16:10	Real Estate	Lost	Exclus	Advertisement	1 679 954.00	001-320-084-06...	williambrown@yahoo.com	Abbott LLC	23/05/2024
Gary	Delgado	28/04/2025 16:11	Real Estate	New	Ouvrte	Advertisement	4 019 058.00	828.606.5026x67...	mellisimon@yahoo.com	Abbott LLC	28/11/2023
Jason	Johnson	28/04/2025 15:25	Technology	New	Ouvrte	Website	3 436 754.00	(655)504-5668x3...	tpowell@gmail.com	Abbott Ltd	15/05/2023

Figure 10: Verification of Migrated Leads in Dynamics 365

This screenshot confirms the successful migration of lead data by showing the newly populated lead records directly within the Dynamics 365 interface, validating the ETL process.

3.1.2 Account and Contact Migration (Sprint 2)

This phase established the foundational customer records, using lookup transformations in SSIS to correctly link contacts to their parent accounts. This ensures that the relationships between accounts and contacts are accurately maintained within the CRM.

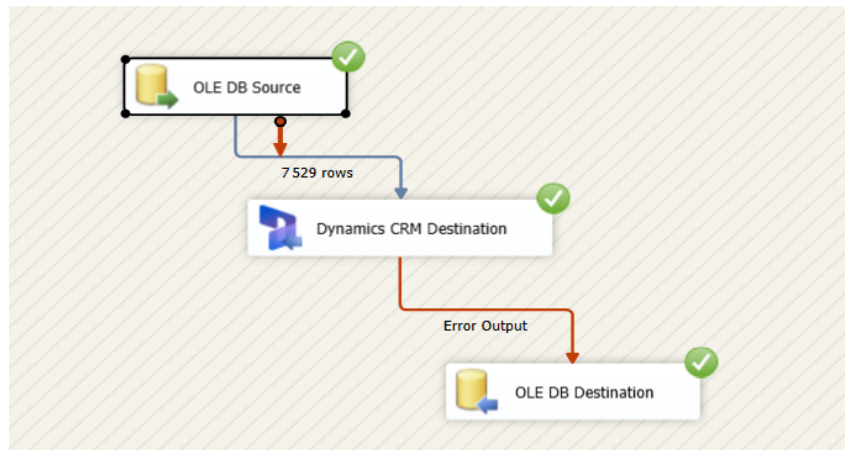
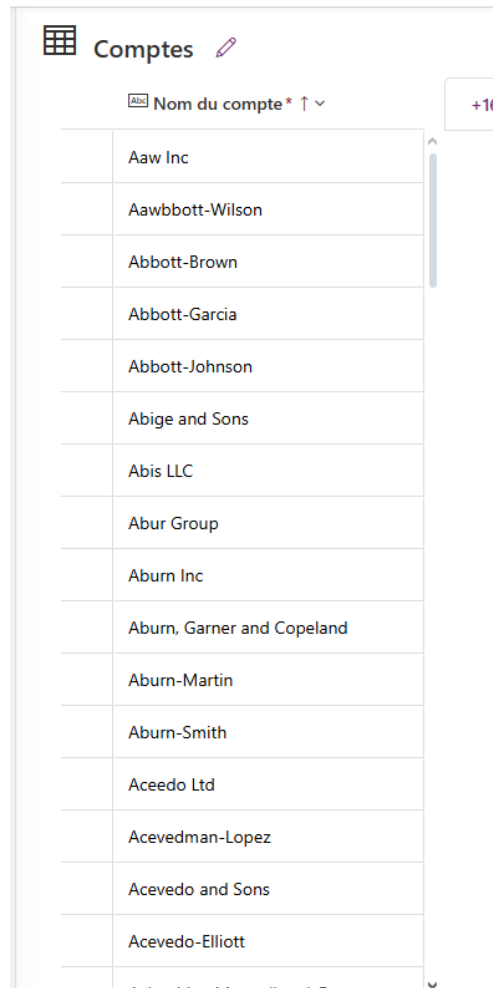


Figure 11: SSIS Data Flow: Account Migration

This data flow details the process of extracting, cleaning, and loading account information into Dynamics 365, setting up the primary organizational entities.



The screenshot shows the 'Comptes' (Accounts) section in Dynamics 365. At the top, there is a header with a grid icon, the title 'Comptes', and an edit icon. Below the header is a search bar with the placeholder text 'Nom du compte * ↑ ↓' and a '+16' indicator. The main area contains a table with 16 rows, each representing an account. The accounts listed are: Aaw Inc, Aawbbott-Wilson, Abbott-Brown, Abbott-Garcia, Abbott-Johnson, Abige and Sons, Abis LLC, Abur Group, Aburn Inc, Aburn, Garner and Copeland, Aburn-Martin, Aburn-Smith, Aceedo Ltd, Acevedman-Lopez, Acevedo and Sons, and Acevedo-Elliott. The table has a vertical scrollbar on the right side.

Nom du compte
Aaw Inc
Aawbbott-Wilson
Abbott-Brown
Abbott-Garcia
Abbott-Johnson
Abige and Sons
Abis LLC
Abur Group
Aburn Inc
Aburn, Garner and Copeland
Aburn-Martin
Aburn-Smith
Acedo Ltd
Acedman-Lopez
Acedo and Sons
Acedo-Elliott

Figure 12: Migrated Accounts in Dynamics 365

A view of the Dynamics 365 interface confirming that the account records have been successfully migrated and are visible within the system.

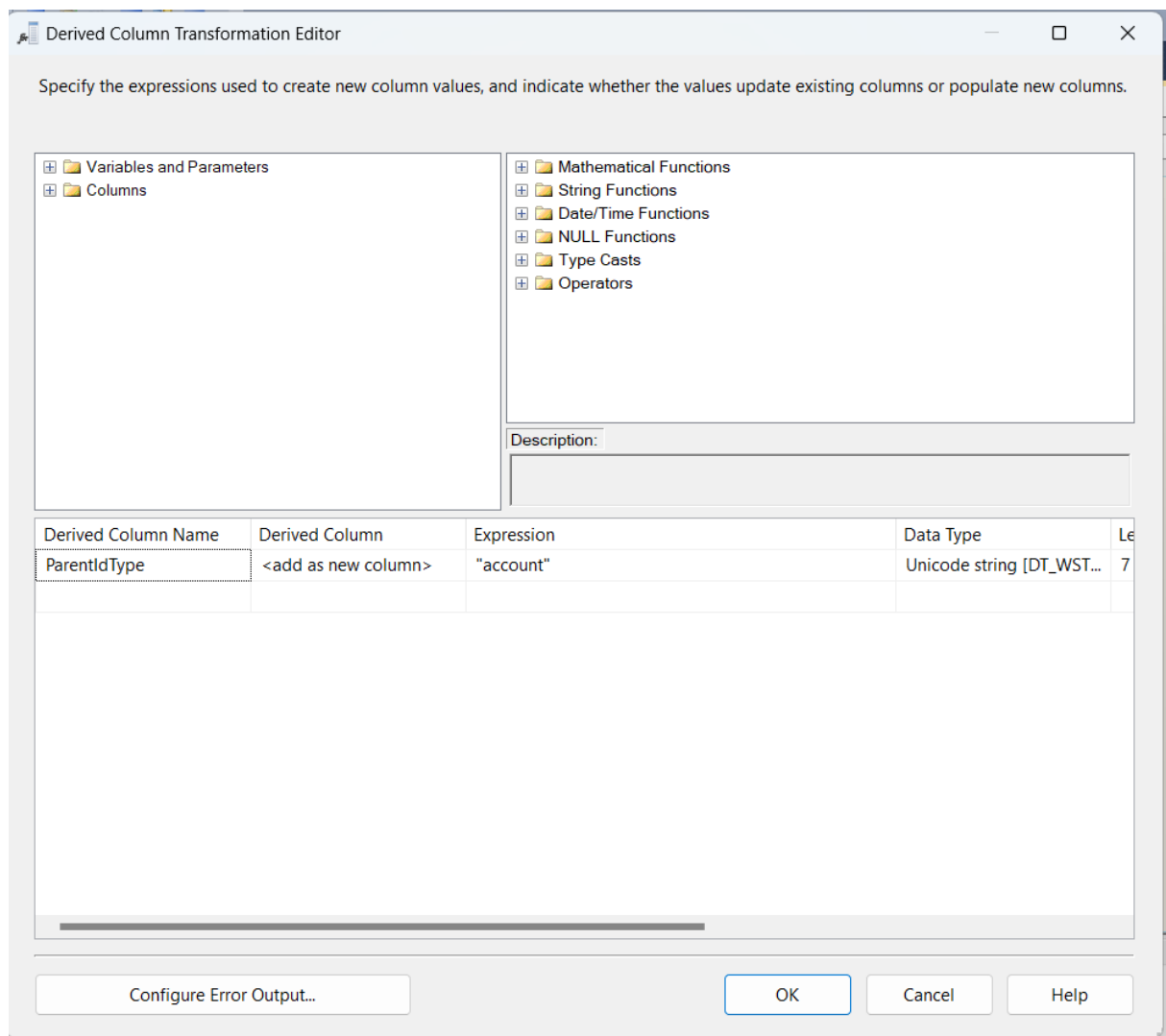


Figure 13: Derived Column for Contact Parent Entity Type

This transformation adds a derived column to specify the parent entity type for contacts, crucial for establishing hierarchical relationships.

Text Lookup - v24.1.1 (24.1.1.24301)

Text Lookup Editor
Specify how text lookup is performed for 'parentcustomerid' field of 'contact' entity.

☐ Do not Use Text Lookup (Input values are provided in GUID format)
☐ Use Primary Field (All)
☒ Choose Target Field(s)

☐ Opt out all

Target entity	Lookup method	Target text/integer field	Secondary lookup field (as needed)		Write NULL on empty value(s)	Smart Name Match ^	Exclude inactive *	Optional default value (if no match) *
			Input column	Target field				
account	Manually Specify	name			☐	☐	☐	
contact	Primary Field				☐	☐	☐	

Advanced Options *

☐ Ignore Case *
☐ Ignore Diacritics/Accents **
☐ Ignore Leading Whitespace **
☐ Ignore Trailing Whitespace **
☐ Report Error on Duplicates *
☐ Skip Record if Lookup Fails *

Cache Strategy *

☒ Full Cache *
☐ Partial Cache (make sure the chosen fields are covered by db indexes) *

* Not applicable to Alternate Key lookup
 * Option is fully supported by the Full Cache mode. For Partial Cache, the rule is only applied to input values
 ^ Only applicable to person names in typical writing formats (Firstname Lastname and Lastname, Firstname)

OK Cancel

Figure 14: Parent Account Lookup Configuration for Contacts

This screenshot illustrates the configuration of the lookup transformation, which links contacts to their respective parent accounts using shared identifiers.

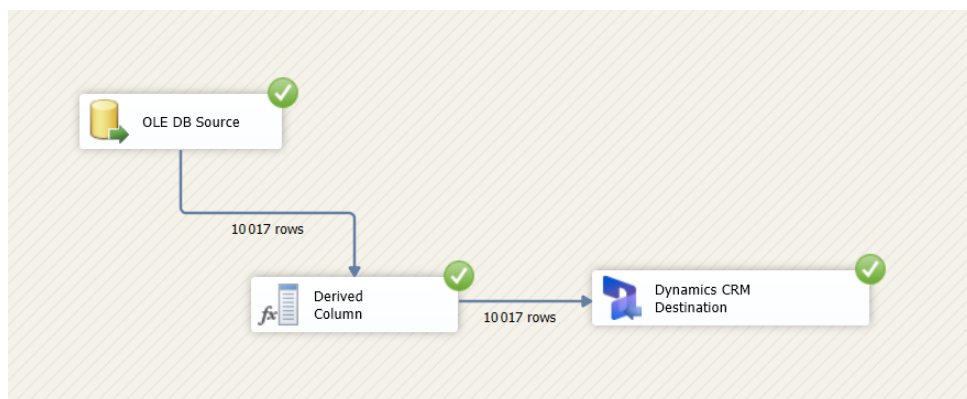


Figure 15: SSIS Data Flow: Contact Migration

The complete SSIS data flow for migrating contact information, including the lookups to associate them with existing accounts.

Contacts 					
Nom complet ▾	Nom de la société ▾	Nom de famille* ▾	Prénom ▾	Téléphone ... ▾	Courrier électronique ▾
Christopher Sanchez	Butler	Sanchez	Christopher	+1-140-709-264...	aanderson@yahoo.com
Alexandra Lowman	Sanchez, Campbell and Scott	Lowman	Alexandra	(250)429-3605x4...	aaron@yahoo.com
Timothy Hawkins	Hurley, Lede and Wiggins	Hawkins	Timothy	+1-462-697-364...	aaron00@johnson.com
Ashley Marshall	Martinez-Jones	Marshall	Ashley	001-384-359-12...	aaron15@gmail.com
David Mathews	Potter Ltd	Mathews	David	891.953.6610	aaron19@gmail.com
Elizabeth Howard	Harrison, Bailey and Butler	Howard	Elizabeth	(927)317-3274x8...	aaron20@ramirez.com
Loretta Chavez	Conrad PLC	Chavez	Loretta	508.856.9403	aaron25@gmail.com
Chsea Garrett	Smith, Fisher and Romero	Garrett	Chsea	(180)528-2245	aaron32@martinez.org
Elizabeth Guzman	Butler, McGee and Gamble	Guzman	Elizabeth	001-713-707-56...	aaron32@yahoo.com
Cheryl Nguyen	Smith, Stephenson and Ray	Nguyen	Cheryl	(721)199-0723x3...	aaron36@harris.com
Christopher Moran	Dean, Malone and Anderson	Moran	Christopher	+1-635-600-227...	aaron41@yahoo.com
Tabie Shaw	Hicks and Sons	Shaw	Tabie	(811)619-3648x3...	aaron45@gmail.com
Mary Rea	Taylor, Davies and Ortiz	Rea	Mary	(792)622-7141x2...	aaron51@jones-griffith.com
Krystal Braunrd	Larson-Jones	Braunrd	Krystal	-1684	aaron60@miller.org
Joshua Ortega	Newman-Santiago	Ortega	Joshua	(803)364-8727	aaron60@moore-miller.com
Michelle Morgan	Lawson-Burton	Morgan	Michelle	+1-716-177-154...	aaron62@taylor.org
Elizabeth Kelly	Bell-Bock	Kelly	Elizabeth	+1-4493-326-88...	aaron65@gmail.com
Michael Weber	Carter-Ramirez	Weber	Michael	001-271-711-26...	aaron68@yahoo.com
Diane Black	Johnson, Blanch and Howard	Black	Diane	001-420-712-90...	aaron70@yahoo.com
Christopher DVM	Jackson, Stephenson and Sandoval	DVM	Christopher	+1-224-455-297...	aaron78@yahoo.com
Timothy Perry	Hawkins Inc	Perry	Timothy	(477)492-5741	aaron81@qalhoun-lopez.com

Figure 16: Verification of Migrated Contacts in CRM

A screenshot from Dynamics 365 displaying the newly migrated contact records, confirming their presence and correct association with accounts.

3.1.3 Product, Opportunity, and Quote Migration (Sprint 3)

This sprint focused on transactional data, migrating Products, Opportunities, and Quotes, and linking them back to Accounts and Contacts. This complex phase involved handling multiple interconnected entities to capture the full sales process.

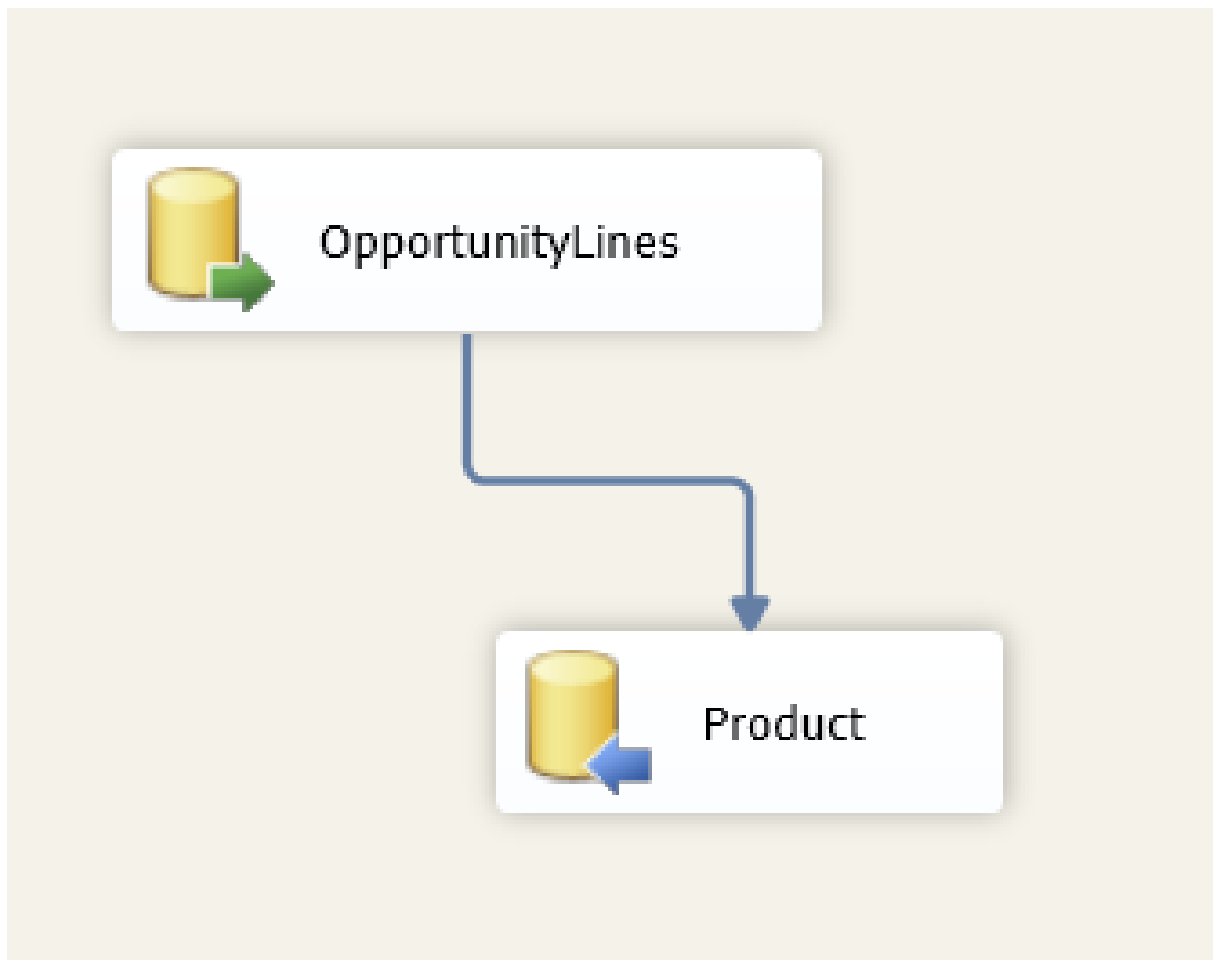


Figure 17: SSIS Data Flow for Product Migration

This SSIS data flow outlines the steps involved in extracting, cleaning, and loading product data into Dynamics 365, ensuring all product details are correctly captured.

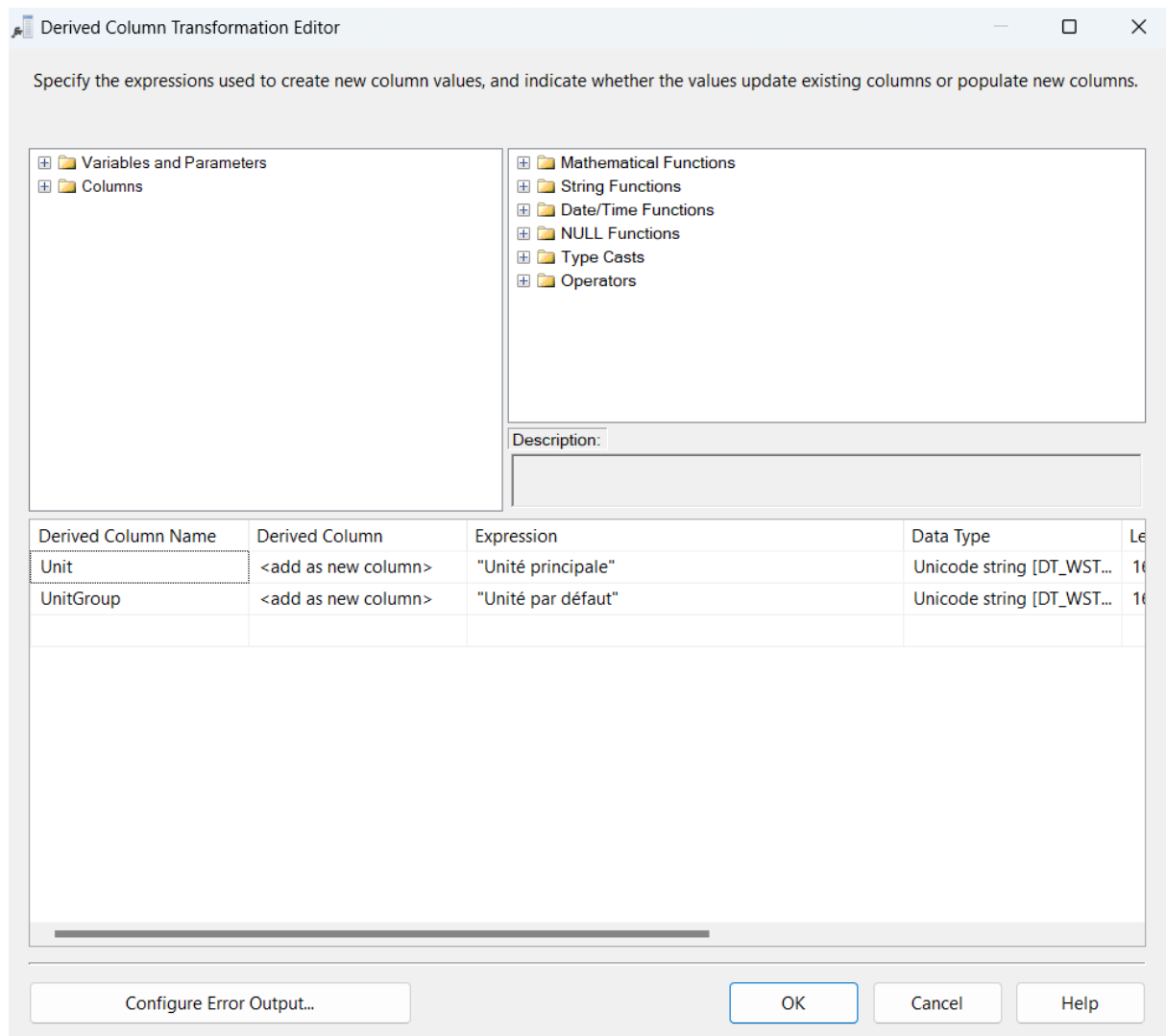


Figure 18: Derived Column Transformation for Default Product Units

The derived column transformation is used to assign default units to products, ensuring consistency in inventory and sales reporting.

☐ Hide Mapped Fields ☒ Hide Unmapped Fields		Find:			
Input Column	Target Field	Text Lookup	Option Value Mapping	Date Type	Unmap
Unit	defaultunitid	☒ Yes		uniqueidentifier	☒
UnitGroup	defaultunitgroupid	☒ Yes		uniqueidentifier	☒
Product Name	name			nvarchar (100)	☒
Unit Price	price			decimal	☒

Figure 19: Product Lookup Transformation for Opportunity Lines

This shows how product information is looked up and linked when migrating opportunity line items, ensuring that each line item correctly references an existing product.

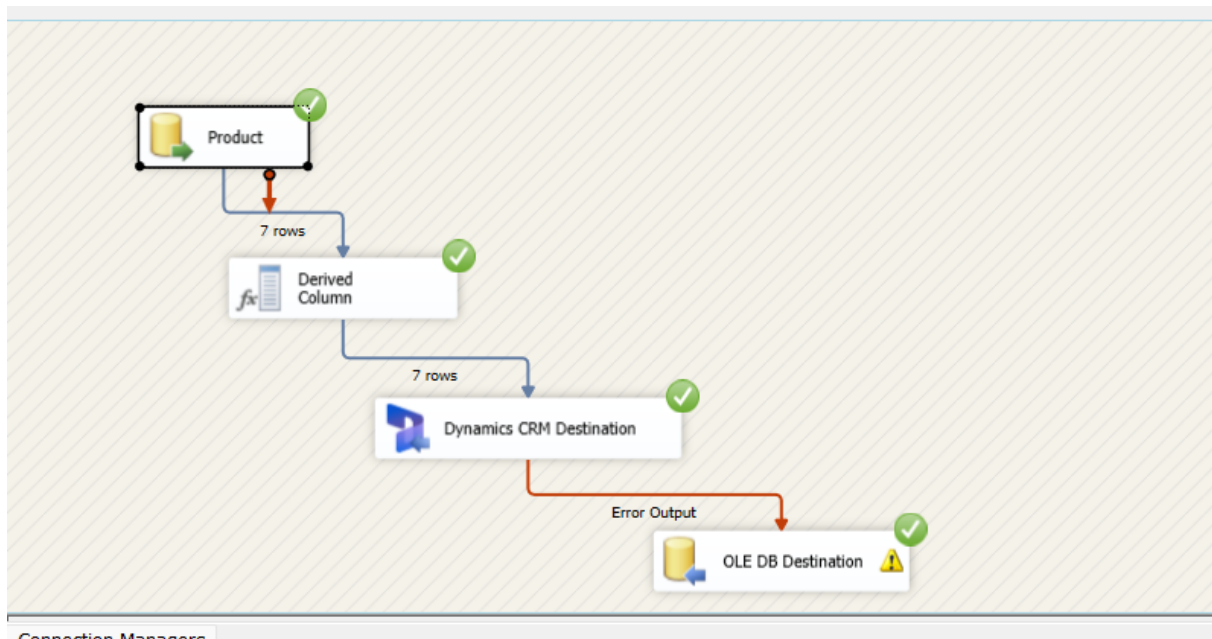


Figure 20: Field Mapping for Product Migration Destination

This image details the specific mapping between source product fields and their corresponding fields in the Dynamics 365 product entity.

Produits				
Nom * 1	Tarif	Groupe d'unités *	Unité par défaut *	
Business Analytics	7 000,00	Unité par défaut	Unité principale	
Cloud Hosting	3 000,00	Unité par défaut	Unité principale	
CRM Software	5 000,00	Unité par défaut	Unité principale	
Custom Development	10 000,00	Unité par défaut	Unité principale	
Cybersecurity Suite	8 000,00	Unité par défaut	Unité principale	
ERP System	20 000,00	Unité par défaut	Unité principale	
IT Support	4 000,00	Unité par défaut	Unité principale	
Enter text	Enter number	Select lookup	Select lookup	

Figure 21: Verification of Migrated Products in Dynamics 365

A screenshot from Dynamics 365 confirming the successful migration and availability of product records within the CRM system.

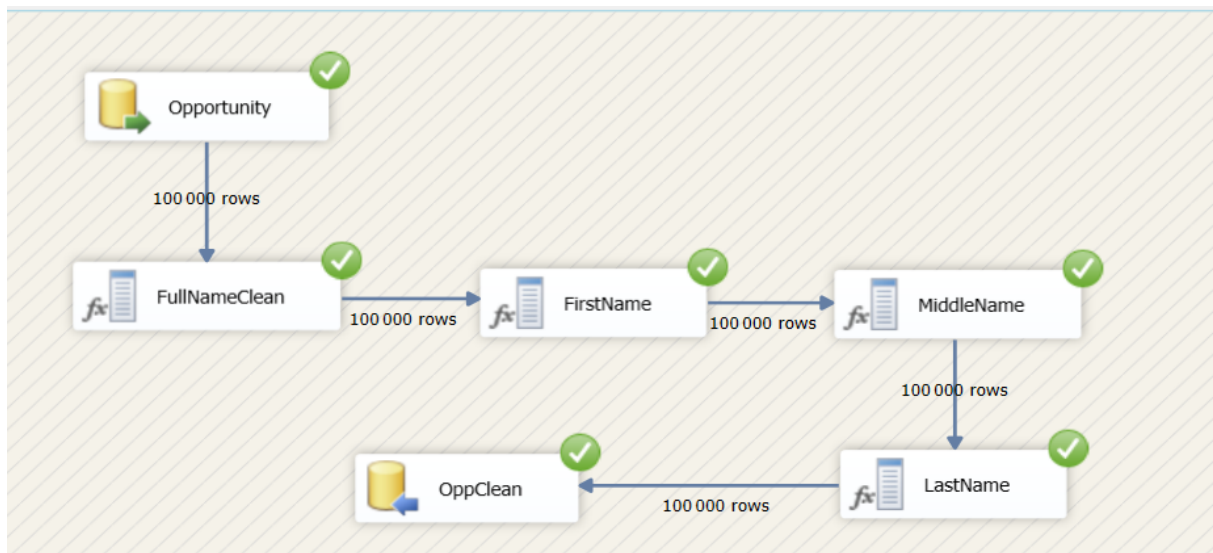


Figure 22: SSIS Data Flow for Cleaning Opportunity Data

This data flow details the initial cleaning processes applied to raw opportunity data to standardize formats and remove inconsistencies before further processing.

Revenue_Poten...	Expected_Close_D...	Full_Name_Cle...	First_Na...	Middle_Na...	Last_Na...
51055,59	08/10/2025	Gary Greena	Gary		Greena
7398,16	30/06/2024	Jerry Wilson	Jerry		Wilson
89927,56	01/06/2024	Michelle Green	Michelle		Green
76286,69	09/08/2025	Ashley Moore	Ashley		Moore
17217,6	30/01/2025	Alexander Moss	Alexander		Moss
74494,19	08/11/2025	Cheryl Moss	Cheryl		Moss
45440,73	29/06/2025	Gary Jenkins	Gary		Jenkins
75044,38	01/07/2025	John Mckay	John		Mckay
77124,17	16/10/2025	Jason Poole	Jason		Poole
67876,56	25/11/2024	Dawn Curtis	Dawn		Curtis
62953,95	08/10/2025	Randy Bullock	Randy		Bullock

Figure 23: Result of Data Cleaning Transformations

A sample of the opportunity data after being subjected to the cleaning transformations, showing improved data quality and consistency.

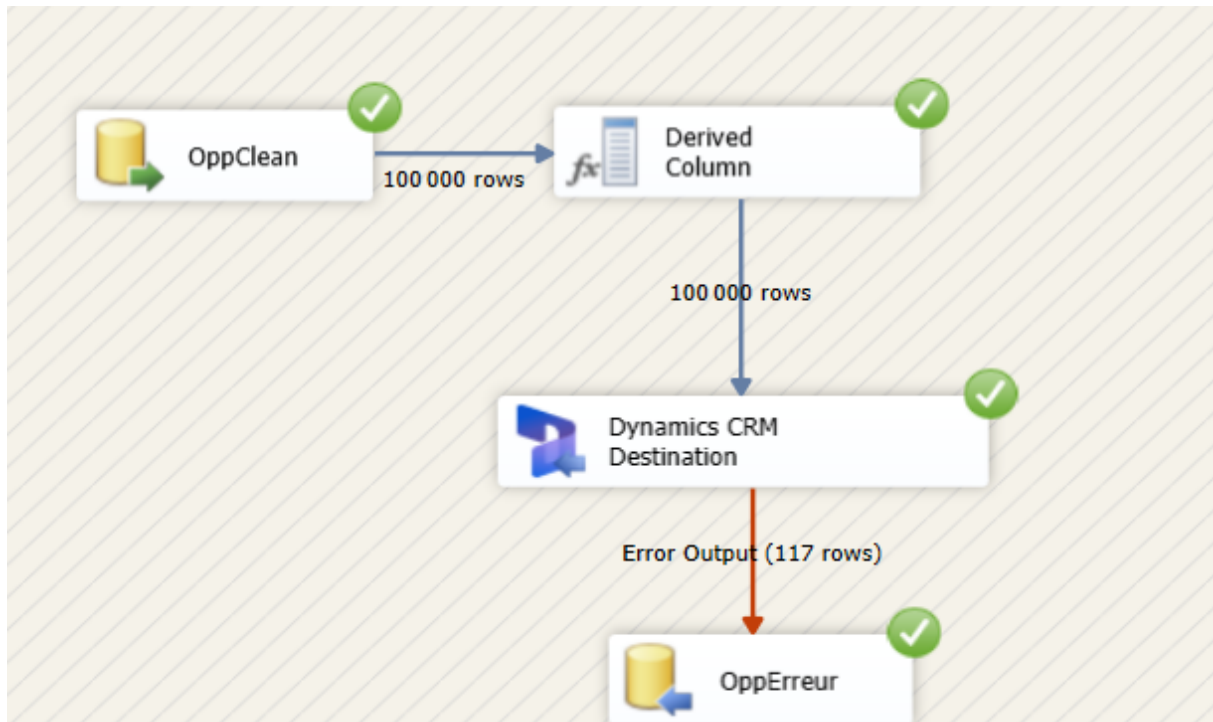


Figure 24: Final SSIS Data Flow for Loading Opportunities

This comprehensive data flow illustrates the entire process of preparing and loading opportunity data into Dynamics 365, including all necessary transformations and lookups.

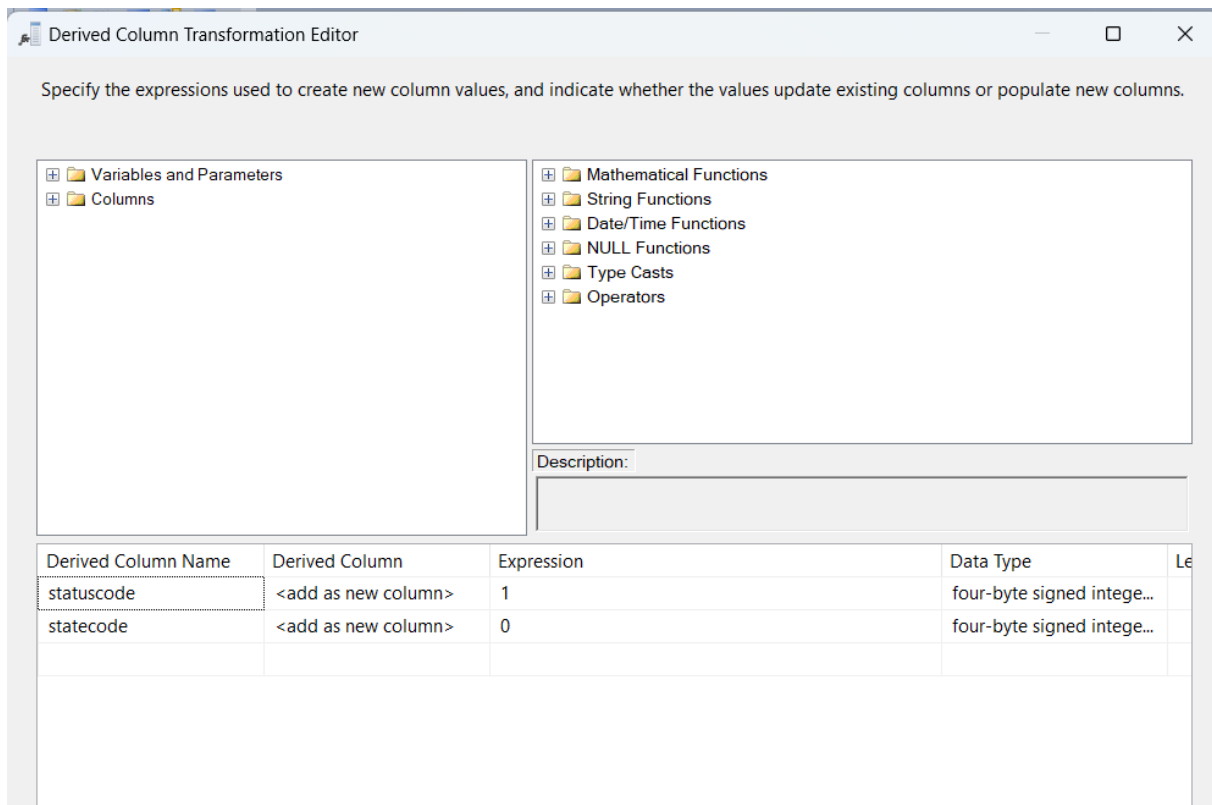


Figure 25: Derived Column Transformation for Opportunity Status

A derived column transformation is applied here to standardize or categorize the status of opportunities, which is crucial for sales funnel analysis.

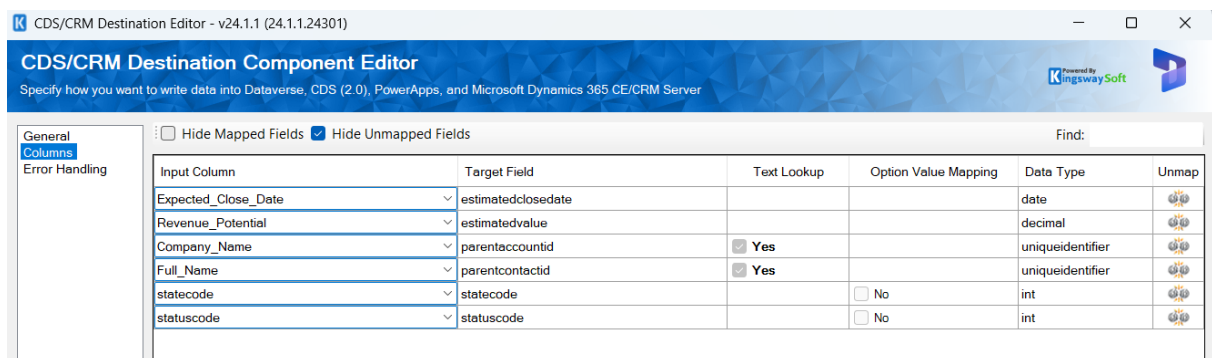


Figure 26: Field Mapping for Opportunity Destination

This image displays the precise mapping of source data fields to the target fields within the Dynamics 365 Opportunity entity.

Opportunités									
Client potentiel	Opportunité	Compte	Contact	Classement	Revenu es...	Date de fer...	Raison du...	Statut	
Duncan-Mendez	59b3af86-232b-d011-8c4d-000d3aae6635	Duncan-Mendez	Brian Miller	Intéressé	56 314,37	18/06/2024	En cours	Ouvert(e)	
Campbell, Smith and Jones	5ab3af86-232b-d011-8c4d-000d3aae6635	Campbell, Smith and Jones	Ashley Martin	Intéressé	49 095,52	01/01/2026	En cours	Ouvert(e)	
Bates, Clay and Burch	5bb3af86-232b-d011-8c4d-000d3aae6635	Bates, Clay and Burch	Elizabeth Garcia	Intéressé	82 638,24	27/08/2025	En cours	Ouvert(e)	
Roth	5cb3af86-232b-d011-8c4d-000d3aae6635	Roth	Leon Lyn	Intéressé	79 813,15	18/04/2025	En cours	Ouvert(e)	
Simon-Lowe	5db3af86-232b-d011-8c4d-000d3aae6635	Simon-Lowe	Leslie Brown	Intéressé	60 564,49	10/05/2025	En cours	Ouvert(e)	
Brown, Peters and Foster	5eb3af86-232b-d011-8c4d-000d3aae6635	Brown, Peters and Foster	Roberta Gutierrez	Intéressé	60 036,39	15/02/2024	En cours	Ouvert(e)	
Edwards, Hall and Ross	5fb3af86-232b-d011-8c4d-000d3aae6635	Edwards, Hall and Ross	Valeruela Boyd	Intéressé	37 668,11	09/01/2026	En cours	Ouvert(e)	
Flores-Jenkins	60b3af86-232b-d011-8c4d-000d3aae6635	Flores-Jenkins	Robert Terry	Intéressé	54 939,67	22/01/2025	En cours	Ouvert(e)	
Fox Inc	61b3af86-232b-d011-8c4d-000d3aae6635	Fox Inc	Jan Olson	Intéressé	74 284,90	01/06/2025	En cours	Ouvert(e)	
Hammond-Palmer	62b3af86-232b-d011-8c4d-000d3aae6635	Hammond-Palmer	Steven Santos	Intéressé	95 568,82	24/07/2024	En cours	Ouvert(e)	
Harrison Ltd	63b3af86-232b-d011-8c4d-000d3aae6635	Harrison Ltd	Ty Reynolds	Intéressé	35 022,65	02/02/2025	En cours	Ouvert(e)	
Smith-Jenkins	64b3af86-232b-d011-8c4d-000d3aae6635	Smith-Jenkins	Cheryl Nguyen	Intéressé	39 883,62	07/03/2025	En cours	Ouvert(e)	
Wolina, Mcgee and Williams	65b3af86-232b-d011-8c4d-000d3aae6635	Wolina, Mcgee and Williams	Cheryl Nguyen	Intéressé	54 667,56	15/07/2024	En cours	Ouvert(e)	
Banks Ltd	66b3af86-232b-d011-8c4d-000d3aae6635	Banks Ltd	Cheryl Nguyen	Intéressé	46 791,77	23/06/2025	En cours	Ouvert(e)	
Garcia, Palmer and Gamble	67b3af86-232b-d011-8c4d-000d3aae6635	Garcia, Palmer and Gamble	Ronald Robinson	Intéressé	49 615,40	08/12/2025	En cours	Ouvert(e)	
Frye-Pugh	68b3af86-232b-d011-8c4d-000d3aae6635	Frye-Pugh	David Gross DDS	Intéressé	25 807,02	20/06/2025	En cours	Ouvert(e)	
Smith Inc	69b3af86-232b-d011-8c4d-000d3aae6635	Smith Inc	Ronald Stevenson	Intéressé	61 863,02	28/06/2024	En cours	Ouvert(e)	
Rose, Cooper and Chapman	6ab3af86-232b-d011-8c4d-000d3aae6635	Rose, Cooper and Chapman	Sarah Valentine	Intéressé	56 792,15	03/07/2024	En cours	Ouvert(e)	
Gutierrez, Davis and Wilson	6bb3af86-232b-d011-8c4d-000d3aae6635	Gutierrez, Davis and Wilson	Elizabeth Robinson	Intéressé	15 128,61	14/05/2025	En cours	Ouvert(e)	
Jones, Hanson and Chapman	6cb3af86-232b-d011-8c4d-000d3aae6635	Jones, Hanson and Chapm...	Alan Jenkins	Intéressé	55 854,80	06/11/2025	En cours	Ouvert(e)	
Livingston Moncure Inc	6db3af86-232b-d011-8c4d-000d3aae6635	Livingston Moncure Inc	Gary Greena	Intéressé	51 055,59	08/10/2025	En cours	Ouvert(e)	

Figure 27: Verification of Migrated Opportunities in Dynamics 365

This screenshot confirms the successful migration of opportunity records, showing their presence and details within the Dynamics 365 CRM.



Figure 28: Opportunity Lines: Data Flow

This SSIS data flow illustrates the steps taken to process and integrate individual line items associated with each sales opportunity, detailing products and quantities.

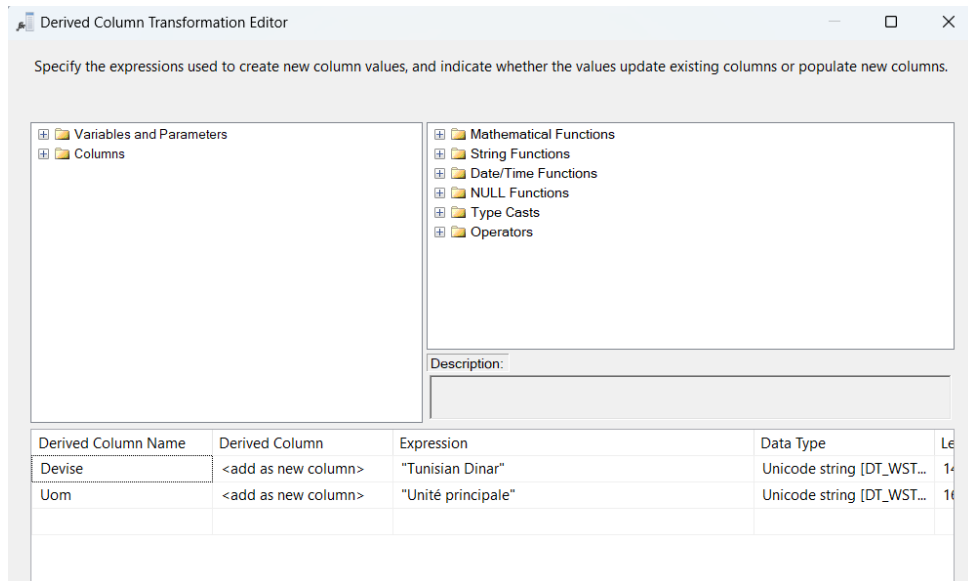


Figure 29: Opportunity Lines: Source Configuration

This configuration shows the setup for extracting opportunity line data from its source, specifying connection details and initial queries.

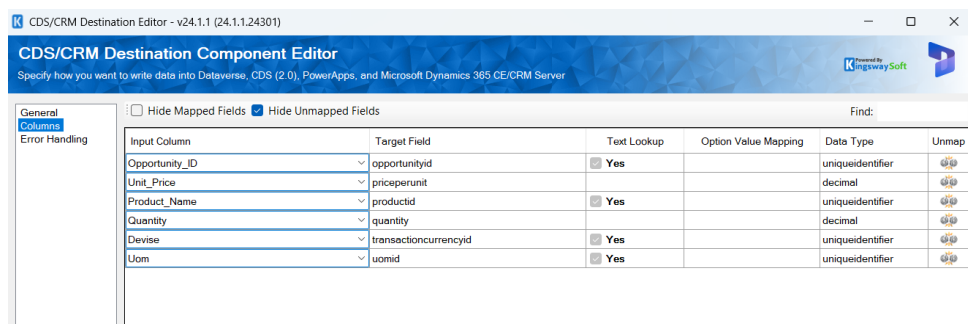


Figure 30: Opportunity Lines: Destination Configuration

This configuration details how the processed opportunity line data is mapped and loaded into the Dynamics 365 destination, ensuring correct field alignment.

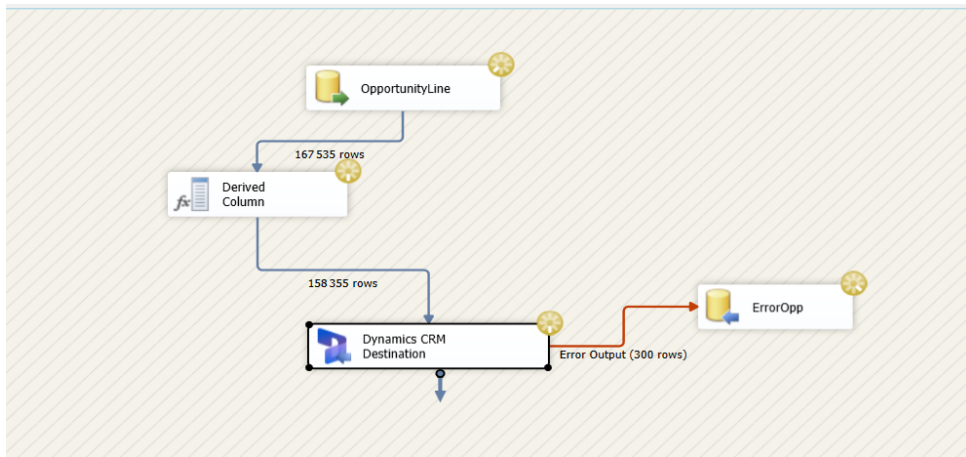


Figure 31: Opportunity Lines: Full Package View

A complete view of the SSIS package dedicated to opportunity lines, showing the sequence of tasks and data flow components.

Nom du produit	Quantité	Prix unitaire	Devise	Produit d'opportunité	Opportunité	Unité	Created On
Business Analytics	6,00000	7 000,00	Tunisian Dinar	c3b21544-102f-f011-8c4d-000d3...	9b-de57-4f33-bda5-86d9b2aa883c	Unité principale	12/05/2025 10:05
Custom Development	9,00000	10 000,00	Tunisian Dinar	c4b21544-102f-f011-8c4d-000d3...	a6-595c-4e8b-9e85-63def0ef60a4	Unité principale	12/05/2025 10:05
ERP System	4,00000	20 000,00	Tunisian Dinar	c5b21544-102f-f011-8c4d-000d3...	70-ee82-4c14-ad12-09a2c0340e1b	Unité principale	12/05/2025 10:05
ERP System	9,00000	20 000,00	Tunisian Dinar	c6b21544-102f-f011-8c4d-000d3...	f5-adc7-4608-b8a3-0643a2102548	Unité principale	12/05/2025 10:05
Business Analytics	10,00000	7 000,00	Tunisian Dinar	c7b21544-102f-f011-8c4d-000d3...	20-5422-4d99-bc06-40559b7f006f	Unité principale	12/05/2025 10:05
IT Support	8,00000	4 000,00	Tunisian Dinar	c8b21544-102f-f011-8c4d-000d3...	ae-2892-4afe-8f99-0e22da45a528	Unité principale	12/05/2025 10:05
ERP System	1,00000	20 000,00	Tunisian Dinar	c9b21544-102f-f011-8c4d-000d3...	93-3d61-475e-b92d-a1eb4dc4600e	Unité principale	12/05/2025 10:05
ERP System	7,00000	20 000,00	Tunisian Dinar	cab21544-102f-f011-8c4d-000d3...	32-4e61-4691-a92b-7178d5ab574b	Unité principale	12/05/2025 10:05
Custom Development	5,00000	10 000,00	Tunisian Dinar	cbb21544-102f-f011-8c4d-000d3...	cd-a0b5-49da-a40c-f5cc693fda97	Unité principale	12/05/2025 10:05
ERP System	6,00000	20 000,00	Tunisian Dinar	ccb21544-102f-f011-8c4d-000d3...	4b-e245-4b36-a48f-7de661381089	Unité principale	12/05/2025 10:05
ERP System	6,00000	20 000,00	Tunisian Dinar	cdb21544-102f-f011-8c4d-000d3...	34-d447-4b76-8df5-5cd652a42558	Unité principale	12/05/2025 10:05
Business Analytics	5,00000	7 000,00	Tunisian Dinar	ceb21544-102f-f011-8c4d-000d3...	8a-fe44-4af3-a4a4-6f080937162	Unité principale	12/05/2025 10:05
CRM Software	5,00000	5 000,00	Tunisian Dinar	cfb21544-102f-f011-8c4d-000d3a...	37-71d0-44fa-b874-485dc9491890	Unité principale	12/05/2025 10:05
Cybersecurity Suite	4,00000	8 000,00	Tunisian Dinar	d0b21544-102f-f011-8c4d-000d3...	b7-f15d-4822-be69-e131ec61d610	Unité principale	12/05/2025 10:05
Business Analytics	6,00000	7 000,00	Tunisian Dinar	d1b21544-102f-f011-8c4d-000d3...	93-8e96-43b4-a888-39a86e4194cf	Unité principale	12/05/2025 10:05
Custom Development	3,00000	10 000,00	Tunisian Dinar	d2b21544-102f-f011-8c4d-000d3...	e3-6671-4b6e-bee7-dcae4906a3b5	Unité principale	12/05/2025 10:05
Cloud Hosting	2,00000	3 000,00	Tunisian Dinar	d3b21544-102f-f011-8c4d-000d3...	aa-13c2-48aa-bebe-1c45c847cb4d	Unité principale	12/05/2025 10:05
Custom Development	9,00000	10 000,00	Tunisian Dinar	d4b21544-102f-f011-8c4d-000d3...	78-4b66-4d35-93d0-3aa7692f2c95	Unité principale	12/05/2025 10:05
CRM Software	6,00000	5 000,00	Tunisian Dinar	d5b21544-102f-f011-8c4d-000d3...	e6-21a4-489b-85f2-e5b1c8b36f18	Unité principale	12/05/2025 10:05
Cybersecurity Suite	8,00000	8 000,00	Tunisian Dinar	d6b21544-102f-f011-8c4d-000d3...	42-f17c-4cef-b7d8-c0f1990d1869	Unité principale	12/05/2025 10:05
ERP System	8,00000	20 000,00	Tunisian Dinar	d7b21544-102f-f011-8c4d-000d3...	78-aab1-470f-807f-8a3b294bccdd	Unité princiale	12/05/2025 10:05

Figure 32: Opportunity Lines: Verification in CRM

A screenshot from Dynamics 365 confirming that the individual opportunity line items have been successfully migrated and are linked to their respective opportunities.

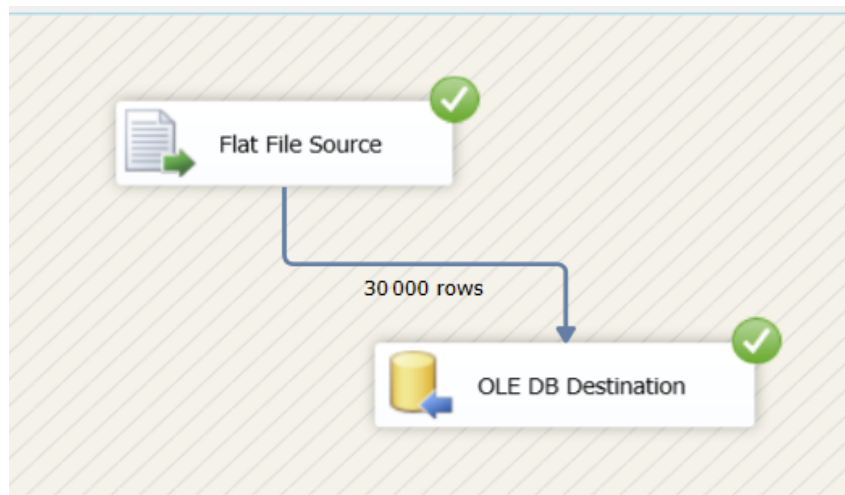


Figure 33: Loading Primary Quote Data to Staging

This data flow depicts the initial loading of core quote data into a staging area, where it undergoes preliminary processing before being merged.

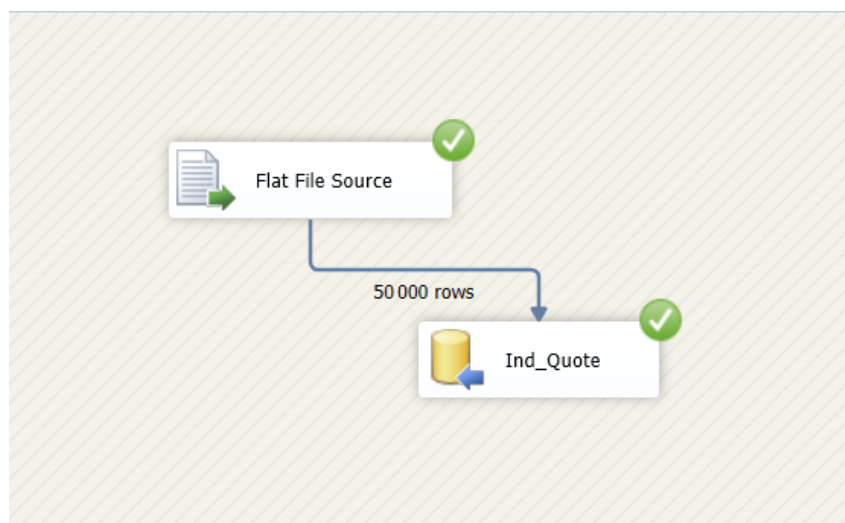


Figure 34: Loading Secondary Quote Data to Staging

This flow shows the loading of supplementary quote data, often from different sources, into another staging area for eventual combination with the primary data.

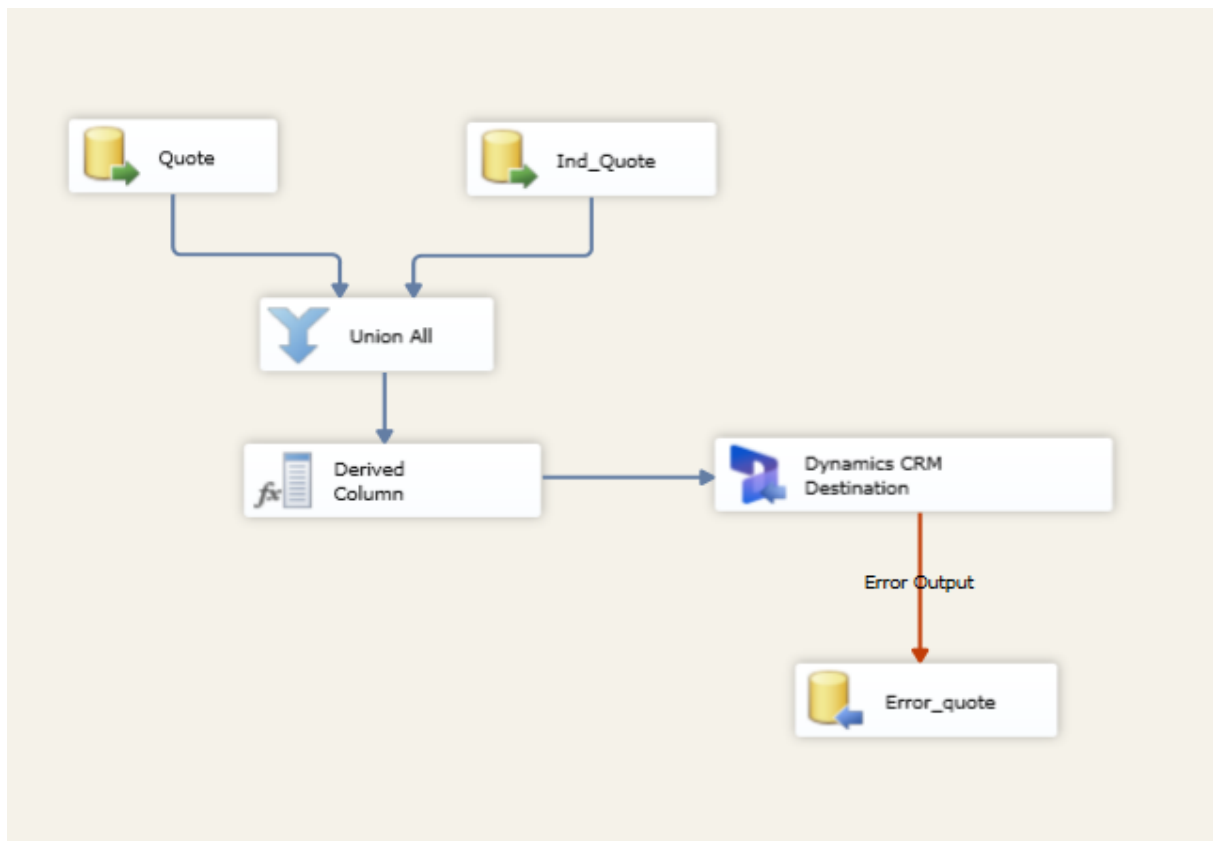


Figure 35: Main SSIS Data Flow for Merging and Loading Quotes

This comprehensive SSIS data flow illustrates the merging of primary and secondary quote data from staging, followed by transformations and final loading into Dynamics 365.

Derived Column Name	Derived Column	Expression	Data Type	Length
CustomeridType	<add as new column>	"account"	Unicode string [DT_WST...	7

Figure 36: Derived Column Transformation for Quote Customer Type

This transformation adds a derived column to categorize the customer type associated with each quote, aiding in segmentation and analysis.

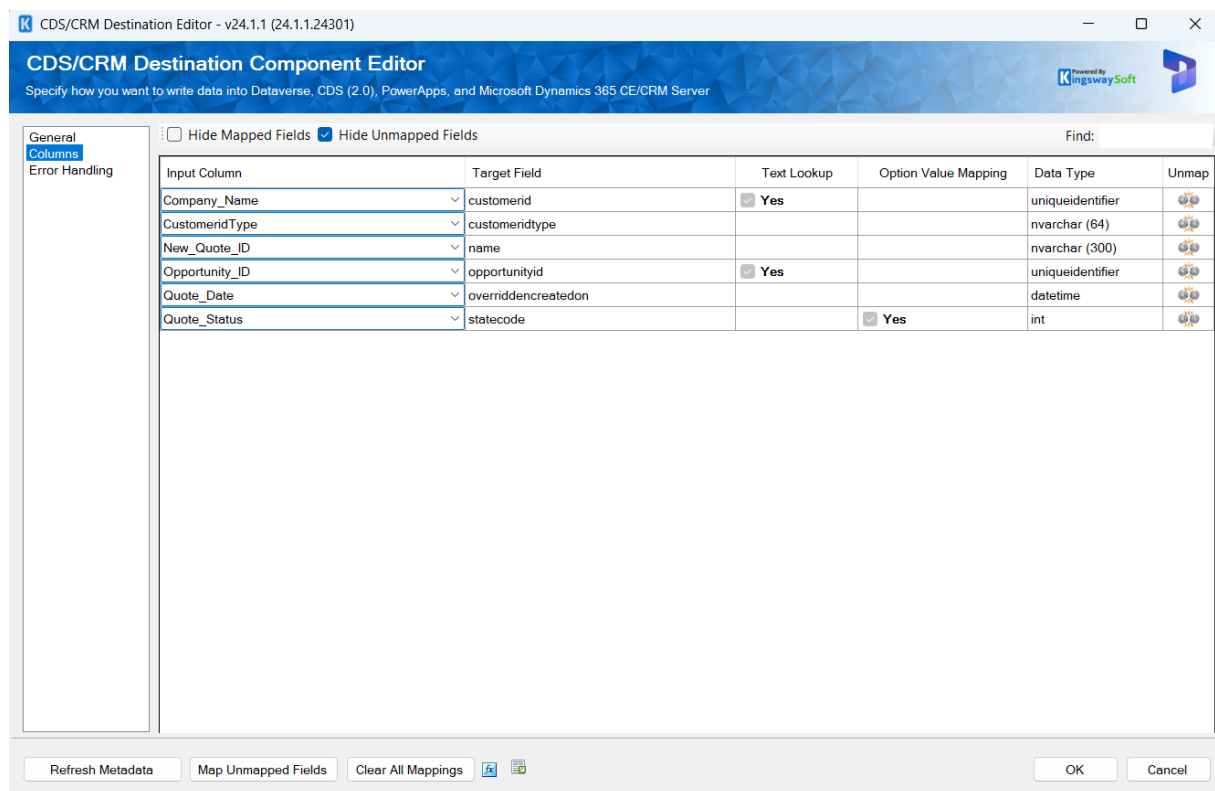


Figure 37: Field Mapping for Quote Destination

This image details the precise mapping of source quote fields to the corresponding fields in the Dynamics 365 Quote entity.

Name	Quote	Potential Customer	Status	Total amount	Created On
7462	ccf68180-a446-f011-877a-6045bdde7aad	Lawloyd, Evans and Sharson	Draft	224,628.70	2/6/2025 1:00 AM
18062	ed17fa50-aa46-f011-877a-6045bdde7aad	Williams Inc	Draft	224,355.90	2/6/2025 1:00 AM
17905	1d19fa50-aa46-f011-877a-6045bdde7aad	Stantdd Inc	Draft	219,350.50	2/6/2025 1:00 AM
4139	5ae72ca3-a346-f011-877a-6045bdde7aad	Price-Fitter	Draft	219,103.70	2/6/2025 1:00 AM
13009	bd9ce69e-a846-f011-877a-6045bdde7aad	Boyd Inc	Draft	217,797.30	2/6/2025 1:00 AM
10745	0d0c6cb7-a746-f011-877a-6045bdde7aad	Kerrano, Smith and Jacobs	Draft	215,972.40	2/6/2025 1:00 AM
8032	418314ad-a446-f011-877a-6045bdde7aad	Martinez-Gamble	Draft	211,487.30	2/6/2025 1:00 AM
3279	9ea85d79-a346-f011-877a-6045bdde7aad	Moore, Torres and Mccoyle	Draft	210,024.60	2/6/2025 1:00 AM
5828	22b43640-a446-f011-877a-6045bdde7aad	Owens-Lara	Draft	209,506.20	2/6/2025 1:00 AM
8058	698314ad-a446-f011-877a-6045bdde7aad	Smith, Hogan and Willis	Draft	208,967.70	2/6/2025 1:00 AM
6664	13d8026b-a446-f011-877a-6045bdde7aad	Tanton, Simster and Jackson	Draft	207,669.90	2/6/2025 1:00 AM
19707	8ef125a0-aa46-f011-877a-6045bdde7aad	Williams-Sims	Draft	207,450.00	2/6/2025 1:00 AM
7081	a7f78180-a446-f011-877a-6045bdde7aad	Crosby-Lucero	Draft	205,465.60	2/6/2025 1:00 AM
13610	984d25cd-a846-f011-877a-6045bdde7aad	Jackson Ltd	Draft	204,842.16	2/6/2025 1:00 AM
1645	abc1053c-a346-f011-877a-6045bdde7aad	Baldwin, Garner and Jones	Draft	204,307.50	2/6/2025 1:00 AM
10247	91f759a0-a746-f011-877a-6045bdde7aad	Knap-Scott	Draft	203,612.31	2/6/2025 1:00 AM
18485	ed40316f-a446-f011-877a-6045bdde7aad	Gardner, Chavez and Dawson	Draft	202,640.30	2/6/2025 1:00 AM
3612	5d2ba68b-a346-f011-877a-6045bdde7aad	Carrington LLC	Draft	202,527.09	2/6/2025 1:00 AM
8006	0f8314ad-a446-f011-877a-6045bdde7aad	Taylor, Gibson and Dunn	Draft	202,120.29	2/6/2025 1:00 AM
4809	8b3cadb7-a346-f011-877a-6045bdde7aad	Jones, Byrd and Blank and Wright	Draft	201,407.22	2/6/2025 1:00 AM
1526	2e9d58fb-a246-f011-877a-6045bdde7aad	Ward-Owens	Draft	200,869.11	2/6/2025 1:00 AM

Figure 38: Verification of Migrated Quotes in Dynamics 365

A screenshot from Dynamics 365 confirming the successful migration of quote records, showing their details and associated information within the CRM.

3.1.4 Quote Lines and Sales Order Migration (Sprint 4)

The final integration sprint handled line-item details for quotes and the full migration of Sales Orders and their corresponding lines, completing the sales lifecycle data. This ensured that all aspects of sales transactions, from initial quotes to final orders, were accurately captured and integrated.

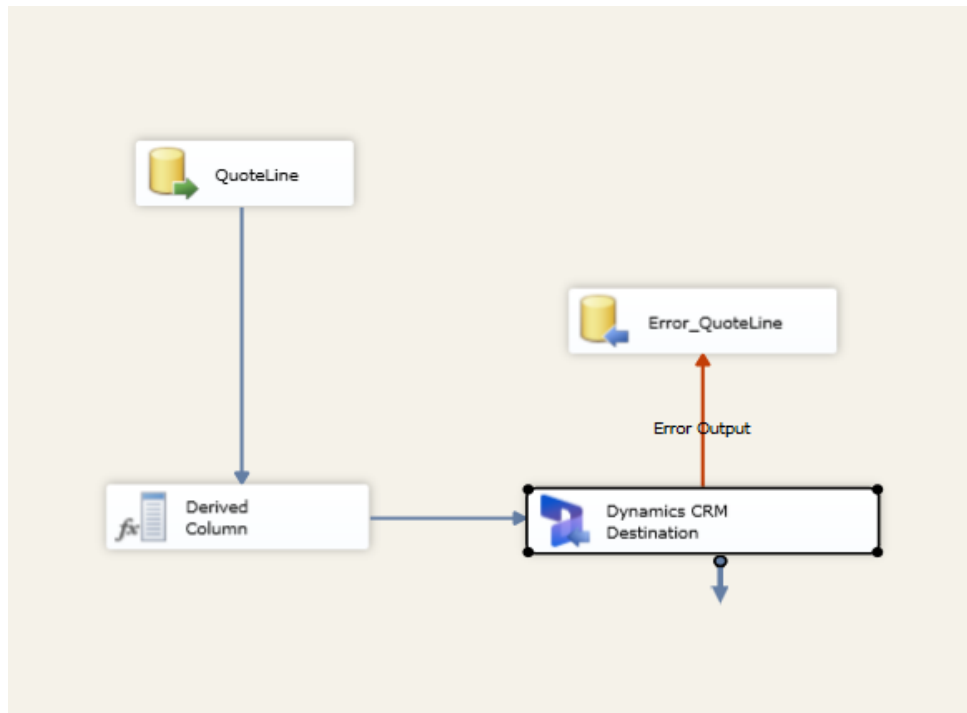


Figure 39: Complete SSIS Data Flow for Quote Line Migration

This SSIS data flow illustrates the entire process of migrating individual line items associated with sales quotes, including lookups to parent quotes and products.

Quote Products 						
Product Name ▾	Property Configuration ▾	Quantity ▾	Unit ▾	Price Per Unit ▾	Extended Amo... ▾	+62 more ▾ +
Cloud Hosting	Edit	1.00000	Primary Unit	2,603.13	2,603.13	
Cloud Hosting	Edit	1.00000	Primary Unit	2,610.42	2,610.42	
Cloud Hosting	Edit	1.00000	Primary Unit	2,620.61	2,620.61	
Cloud Hosting	Edit	1.00000	Primary Unit	2,650.56	2,650.56	
Cloud Hosting	Edit	1.00000	Primary Unit	2,650.83	2,650.83	
Cloud Hosting	Edit	1.00000	Primary Unit	2,724.26	2,724.26	
Cloud Hosting	Edit	1.00000	Primary Unit	2,738.67	2,738.67	
Cloud Hosting	Edit	1.00000	Primary Unit	2,783.67	2,783.67	
Cloud Hosting	Edit	1.00000	Primary Unit	2,803.54	2,803.54	
Cloud Hosting	Edit	1.00000	Primary Unit	2,804.89	2,804.89	
Cloud Hosting	Edit	1.00000	Primary Unit	2,956.05	2,956.05	
Cloud Hosting	Edit	1.00000	Primary Unit	2,965.30	2,965.30	
Cloud Hosting	Edit	1.00000	Primary Unit	2,995.30	2,995.30	
Cloud Hosting	Edit	1.00000	Primary Unit	3,032.19	3,032.19	
Cloud Hosting	Edit	1.00000	Primary Unit	3,032.94	3,032.94	
Cloud Hosting	Edit	1.00000	Primary Unit	3,033.00	3,033.00	
Cloud Hosting	Edit	1.00000	Primary Unit	3,090.06	3,090.06	
Cloud Hosting	Edit	1.00000	Primary Unit	3,103.81	3,103.81	
Cloud Hosting	Edit	1.00000	Primary Unit	3,124.89	3,124.89	
Cloud Hosting	Edit	1.00000	Primary Unit	3,125.72	3,125.72	
Cloud Hosting	Edit	1.00000	Primary Unit	3,177.54	3,177.54	

Figure 40: Verification of Migrated Quote Lines in Dynamics 365

A screenshot from Dynamics 365 verifying the successful migration of quote line items, confirming their correct association with quotes.

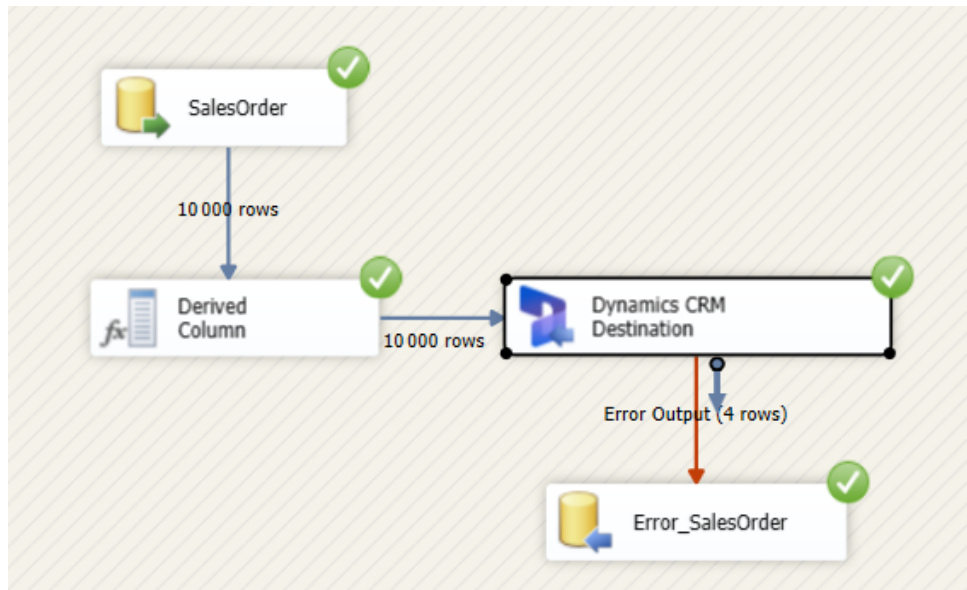


Figure 41: SSIS Data Flow: Sales Order Migration

This data flow details the process of migrating complete sales orders, encompassing all relevant header information and linking them to customers and opportunities.

Orders 			
Quote 	Name * 	Customer * 	Requested Delivery ... 
8653	1	Livingston, Monoventes	2/7/2025
5370	10	Edwards, Anderson and Harper	2/7/2025
41	100	Choi Ltd	2/7/2025
6465	1000	Valdez, Swanson and Allison	2/7/2025
6618	10000	Smith-Schaefer	2/7/2025
2158	1001	Lopez Ltd	2/7/2025
737	1002	Ritter, Rodriguez and Corath	2/7/2025
8639	1003	Kerr and Sons	2/7/2025
2948	1004	Payne Ltd	2/7/2025
963	1005	Chambers and Sons	2/7/2025
520	1006	Martin, Mccowman and Snyder	2/7/2025
4856	1007	Jones LLC	2/7/2025
3937	1008	Armstrong, Meal and Rogers	2/7/2025
2883	1009	Sullivanbers, Brewer and Rh	2/7/2025
7255	101	Butler Inc	2/7/2025
318	1010	Brennan PLC	2/7/2025
4832	1011	Newton Inc	2/7/2025
1569	1012	Smith-Brown	2/7/2025
3160	1013	Palmer-Brown	2/7/2025
5004	1014	Garrett Inc	2/7/2025
9776	1015	Strickland, Gibson and Contreras	2/7/2025

Figure 42: Verification of Migrated Sales Orders in CRM

A screenshot from Dynamics 365 confirming the successful migration of sales order records, showing their accurate representation in the CRM.

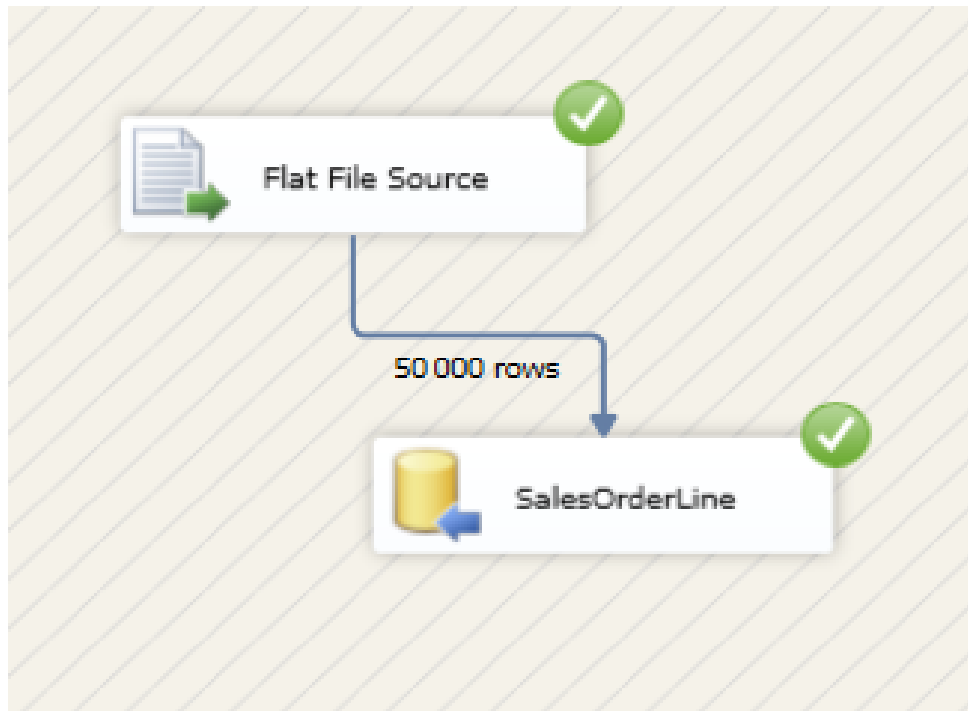


Figure 43: Sales Order Lines: Data Flow

This SSIS data flow outlines the sequence of operations for extracting, transforming, and loading the detailed line items associated with each sales order.

Derived Column Name	Derived Column	Expression	Data Type	Length
uom	<add as new column>	"Primary Unit"	Unicode string [DT_WST...	12
propertyconfigurationst...	<add as new column>	"Edit"	Unicode string [DT_WST...	4

Figure 44: Sales Order Lines: Source Configuration

This configuration displays the settings for connecting to the source data and defining the query used to retrieve sales order line information.

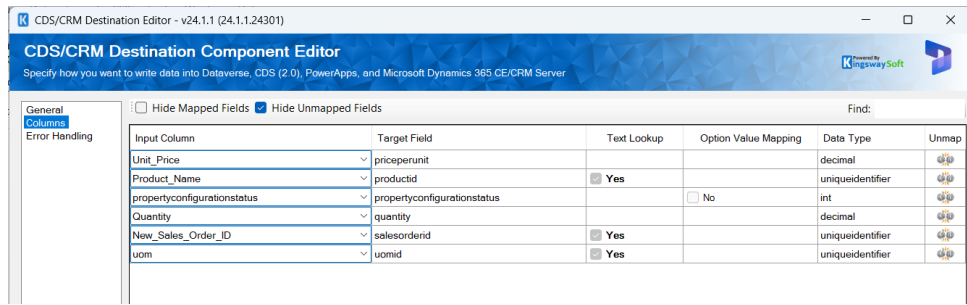


Figure 45: Sales Order Lines: Destination Configuration

This shows the detailed mapping of source columns to the corresponding fields in the Dynamics 365 destination for sales order lines, ensuring data integrity.

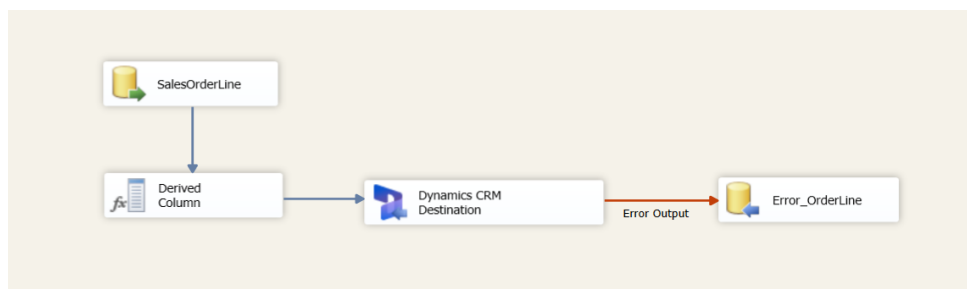


Figure 46: Sales Order Lines: Full Package View

A comprehensive view of the entire SSIS package dedicated to sales order lines, illustrating all components and their interconnections.

Order Products 					
 Product Name ▾	 Price Per Unit ▾	 Property Configuration * ▾	 Unit ▾	0.0 Quantity * ▾	
Cloud Hosting	2,562.07	Edit	Primary Unit	1.00000	
Cloud Hosting	2,588.60	Edit	Primary Unit	1.00000	
Cloud Hosting	2,605.42	Edit	Primary Unit	1.00000	
CRM Software	2,636.30	Edit	Primary Unit	1.00000	
Cloud Hosting	2,677.07	Edit	Primary Unit	1.00000	
Cloud Hosting	2,909.22	Edit	Primary Unit	1.00000	
Cloud Hosting	2,909.98	Edit	Primary Unit	1.00000	
Cloud Hosting	2,945.03	Edit	Primary Unit	1.00000	
Cloud Hosting	2,962.56	Edit	Primary Unit	1.00000	
Cloud Hosting	2,990.76	Edit	Primary Unit	1.00000	
Cloud Hosting	3,003.22	Edit	Primary Unit	1.00000	
Cloud Hosting	3,004.05	Edit	Primary Unit	1.00000	
Cloud Hosting	3,007.36	Edit	Primary Unit	1.00000	
Cloud Hosting	3,007.70	Edit	Primary Unit	1.00000	
Cloud Hosting	3,012.01	Edit	Primary Unit	1.00000	
Cloud Hosting	3,033.17	Edit	Primary Unit	1.00000	
Cloud Hosting	3,039.79	Edit	Primary Unit	1.00000	
Cloud Hosting	3,043.30	Edit	Primary Unit	1.00000	
Cloud Hosting	3,047.18	Edit	Primary Unit	1.00000	
Cloud Hosting	3,053.41	Edit	Primary Unit	1.00000	
Cloud Hosting	3,068.75	Edit	Primary Unit	1.00000	

Figure 47: Sales Order Lines: Verification in CRM

A screenshot from Dynamics 365 confirming the successful migration of individual sales order line items and their correct association with parent sales orders.

3.2 Sprint 5: Data Warehouse Implementation

Goal: Design and build a dimensional model (DWH) to transform the integrated data into a structure optimized for high-performance analytics. This sprint was crucial for creating a robust and query-friendly foundation for all subsequent reporting and predictive modeling.

3.2.1 Architecture: The Constellation Schema

A **Constellation (Galaxy) Schema** was chosen for its flexibility, using multiple fact tables sharing common dimension tables. This schema allows for complex analytical queries while maintaining a relatively simple and understandable structure, catering to different analytical perspectives without redundancy.

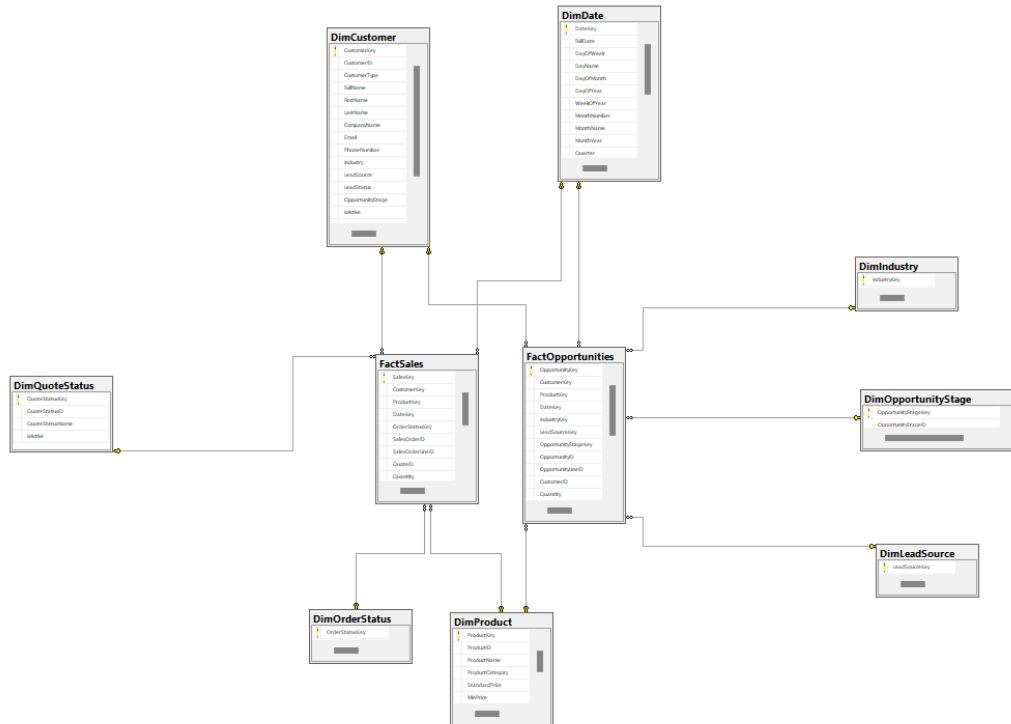


Figure 48: The Constellation Schema of the CRM Data Warehouse

This diagram visually represents the constellation schema, showing the interconnected fact and dimension tables that form the analytical backbone of the BI solution.

3.2.2 Dimension and Fact Tables

Dimension Tables ('DimCustomer', 'DimProduct', 'DimDate', etc.) were created to answer "who, what, and when." These tables store descriptive attributes that provide context to the business events. **Fact Tables** ('FactOpportunities', 'FactSales') were created to store quantitative metrics and answer "how much?" and "what value?". These tables contain the key performance indicators and measures, linked to the dimensions. The interconnected model provides a 360-degree view of the customer journey, enabling deep dives into sales performance and customer behavior.

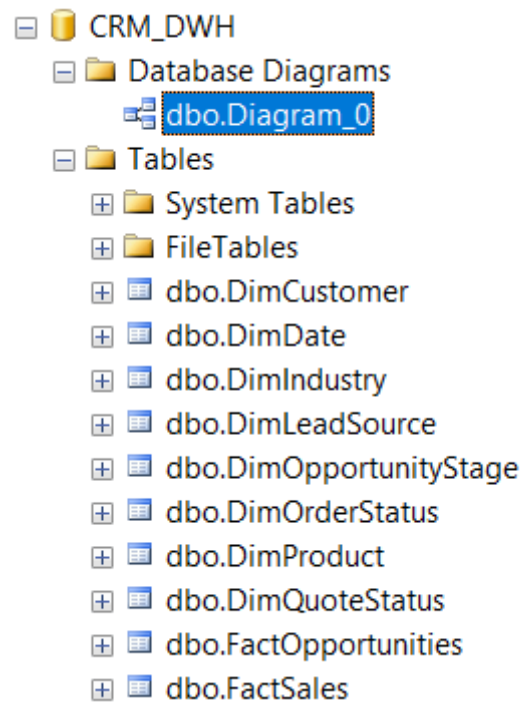


Figure 49: Implemented DWH Tables in SQL Server

This screenshot displays the actual dimension and fact tables as implemented in SQL Server Management Studio, demonstrating the physical realization of the constellation schema.

Chapter 4: Predictive Modeling for Quote Approval

This chapter details the data science phase of the project, which focused on developing a machine learning model to predict the likelihood of a sales quote being approved.

4.1 Objective and Approach

The objective was to answer: "What are the chances a customer will approve a quote?". A comparative approach was used, testing multiple algorithms. Key features included revenue potential, product counts, and customer engagement metrics. This predictive capability empowers sales teams to prioritize efforts and proactively address potential issues before a quote is lost.

4.2 Model Development and Comparison

4.2.1 Baseline Model: RandomForest Classifier

A baseline model using the RandomForest algorithm achieved an accuracy of 76.72%. This model served as an initial benchmark, demonstrating a solid foundation for prediction before further optimization.

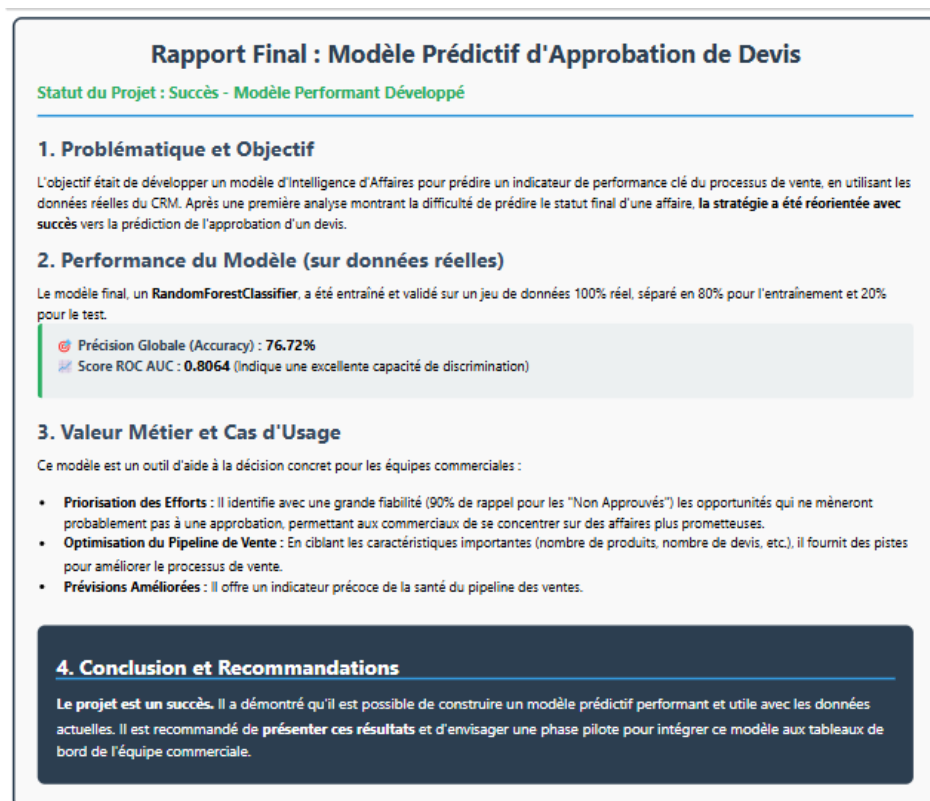


Figure 50: Classification Report and Confusion Matrix for the Baseline RandomForest Model

This figure provides a detailed classification report and confusion matrix, illustrating the performance metrics (precision, recall, F1-score) and the distribution of true vs. predicted outcomes for the RandomForest model.

4.2.2 Champion Model: LightGBM (LGBM) Classifier

A second model using the LGBM algorithm scored better at 79.44%. This model was then optimized using GridSearchCV to reach a final accuracy of **80.04%**.

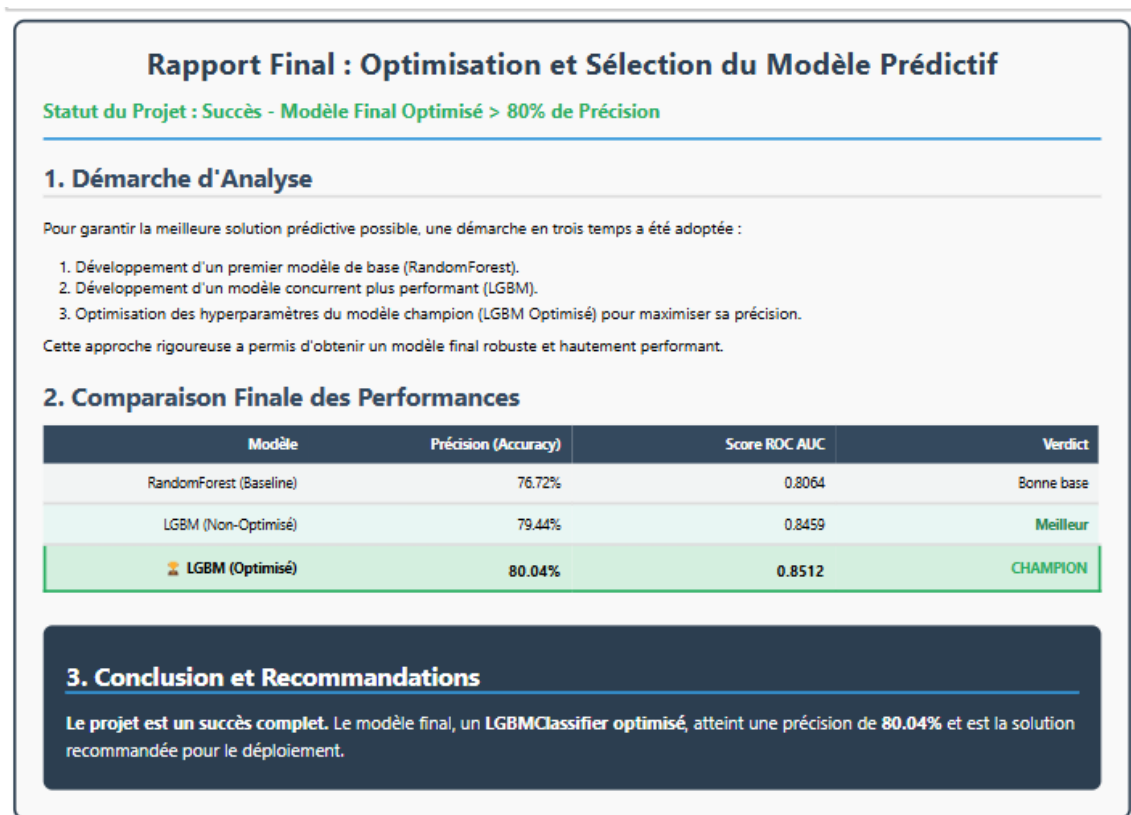


Figure 51: Final Comparison of Quote Approval Model Performance

4.3 Conclusion

The structured, comparative approach yielded a high-performing classification model that provides a powerful tool for proactive sales management.

Chapter 5: Sales Intelligence: The Power BI Dashboards

This chapter details the design and implementation of the Power BI dashboards, which transform the structured data from the DWH into interactive and actionable reports.

5.1 KPI Strategy and Dictionary

A comprehensive set of KPIs was defined to track critical aspects of CRM performance, from sales efficiency to marketing effectiveness and predictive model accuracy. To ensure universal user understanding and consistent interpretation across the organization, a detailed, three-part KPI dictionary was meticulously created. This dictionary serves as a crucial reference, explaining each metric's definition, calculation methodology, and business relevance, thereby democratizing access to and understanding of key performance indicators.

Dictionary of Commercial & Marketing KPIs

Commercial Performance Monitoring			
Indicator (KPI)	Business Question	Definition & Calculation	Strategic Objective
Revenue Achieved (CA)	How much have we sold?	Sum of all total sales amounts (FactSales).	Measure overall financial performance.
Total Profit	What is our actual profitability?	Difference between Total Revenue and Total Cost of Goods Sold.	Measure real profitability and optimize margins.
Sales Volume	How many transactions have we closed?	Total number of rows in the sales table (FactSales).	Track business activity and dynamics.
Average Basket	What is the average value of each sale?	Total Revenue / Sales Volume.	Identify upsell/cross-sell opportunities.
Top 5 Clients	Who are our most important clients?	Identification of the 5 clients generating the most revenue or opportunities.	Manage key strategic accounts.
Previous Year Revenue	How does our performance compare to last year?	Calculation of Revenue for the same period in the previous year for comparison.	Contextualize growth and analyze seasonality.

Figure 52: KPI Dictionary: Commercial Performance Monitoring

Marketing & Sales Funnel Analysis			
Leads Generated	How many new prospects are we acquiring?	Total number of clients initially registered as 'Leads'.	Evaluate the effectiveness of marketing campaigns.
Order Fulfillment Rate	What is our success rate on closed deals?	$(\text{Number of won opportunities} / \text{Number of closed opportunities}) * 100$.	Evaluate overall sales performance.
Conversion Rate (Lead > Opp.)	What % of leads become opportunities?	$(\text{Number of opportunities created} / \text{Number of leads generated}) * 100$.	Measure lead quality and sales team efficiency.
Average Sales Cycle Duration	How long does it take to close a deal?	Average time elapsed between opportunity creation and closure (won or lost).	Identify bottlenecks in the sales process.
Channel Performance	Where do our best opportunities come from?	Analyze acquisition channels (e.g. Referral, Events) to identify top performers.	Optimize marketing budget allocation.

Figure 53: KPI Dictionary: Marketing & Sales Funnel Analysis

Predictive Model Monitoring (Quote Approval)			
Overall Model Accuracy	How accurate is our model across all quotes?	Total percentage of correct predictions (approved and not approved quotes).	Validate the model's overall viability and build team confidence.
Error Rate on Won Quotes	How many winning quotes did the model miss?	Percentage of approved quotes wrongly predicted as not approved (False Negatives).	Minimize missed opportunities. A low rate is key to capturing future sales.
Model Performance Gain	Did the model optimization deliver value?	Precision comparison between the optimized model and a baseline model.	Justify research efforts and prove the final model's robustness.
Key Prediction Factors	What are the model's key decision variables?	Identify and rank variables most influencing the model's prediction (feature importance).	Understand model logic and identify key business levers.
Confidence Score	How likely is this specific quote to be approved?	Score from 0 to 100% generated by the model, indicating approval probability.	Help sales reps prioritize their time on the most promising quotes.

Figure 54: KPI Dictionary: Predictive Model Monitoring

5.2 Dashboard Implementation

5.2.1 The Sales Intelligence Hub

The user's entry point to the Power BI dashboards is a central hub, designed for intuitive navigation and quick access to critical information. This hub not only provides organized access to various reports but also conveniently incorporates the KPI dictionary via a pop-up accessible directly from the page.

This design ensures that business users can easily consult metric definitions, promoting a deeper understanding of the displayed data and facilitating informed decision-making without leaving the reporting environment.

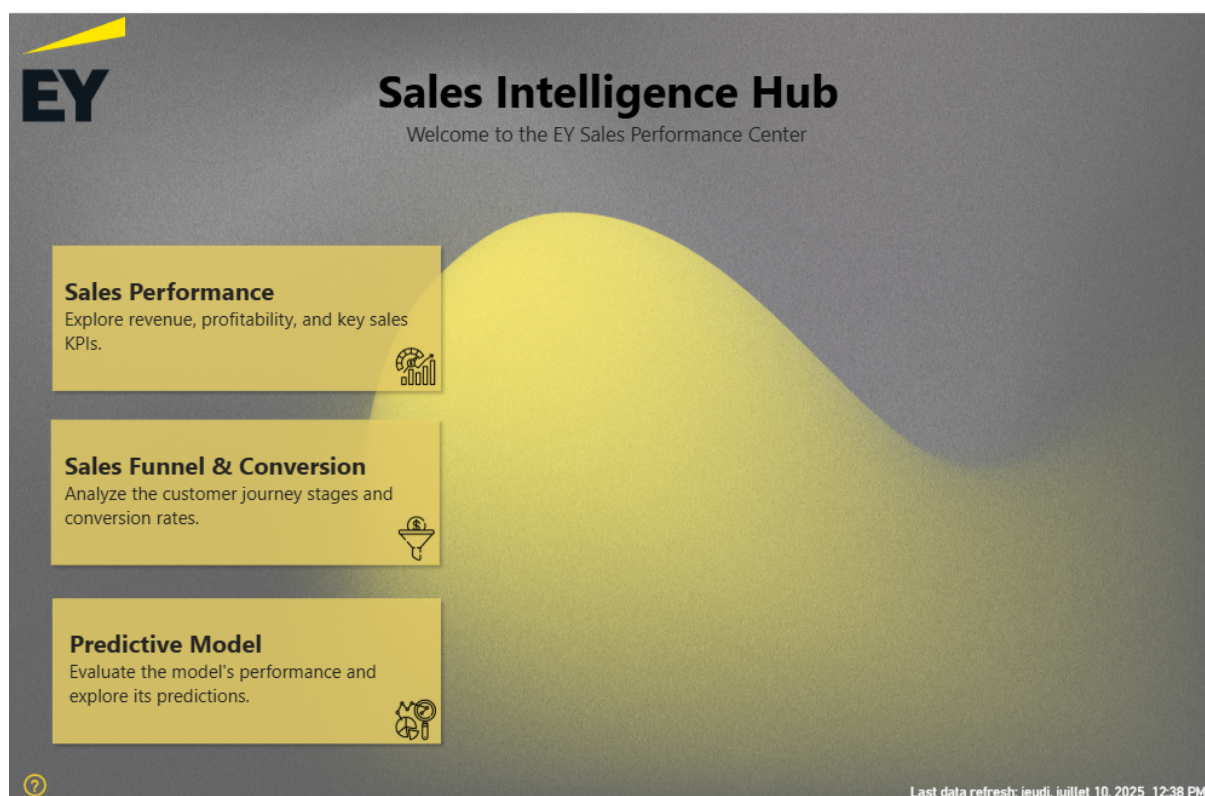


Figure 55: The Sales Intelligence Hub Home Page

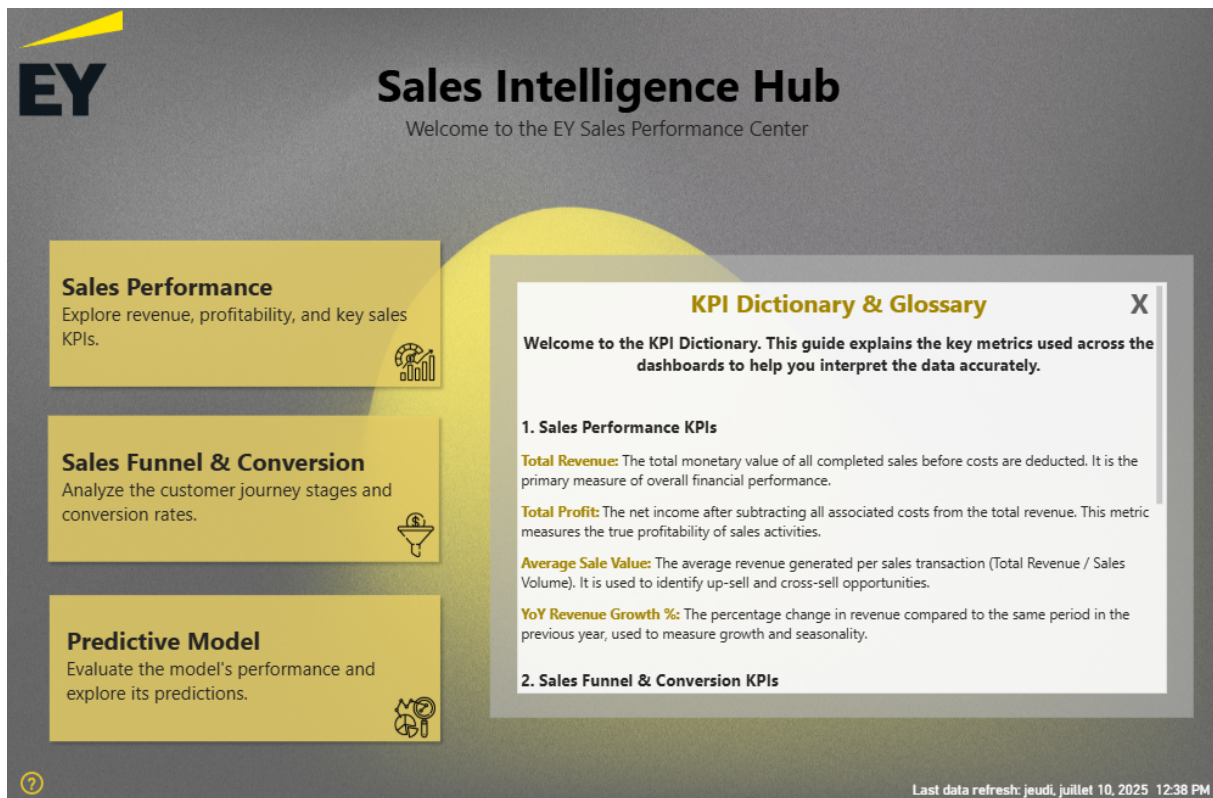


Figure 56: Hub Page with the KPI Dictionary Pop-up

5.2.2 Sales Performance and Funnel Dashboards

The core of the Power BI solution lies in its main dashboards, which offer dynamic and interactive views into overall sales performance and funnel efficiency. These dashboards provide comprehensive insights into key areas such as total revenue, sales volume, average sales cycle duration, and conversion rates across different stages of the sales process. By visualizing these metrics, stakeholders can quickly identify trends, pinpoint bottlenecks, and understand the effectiveness of their sales strategies, enabling data-driven adjustments to optimize performance.

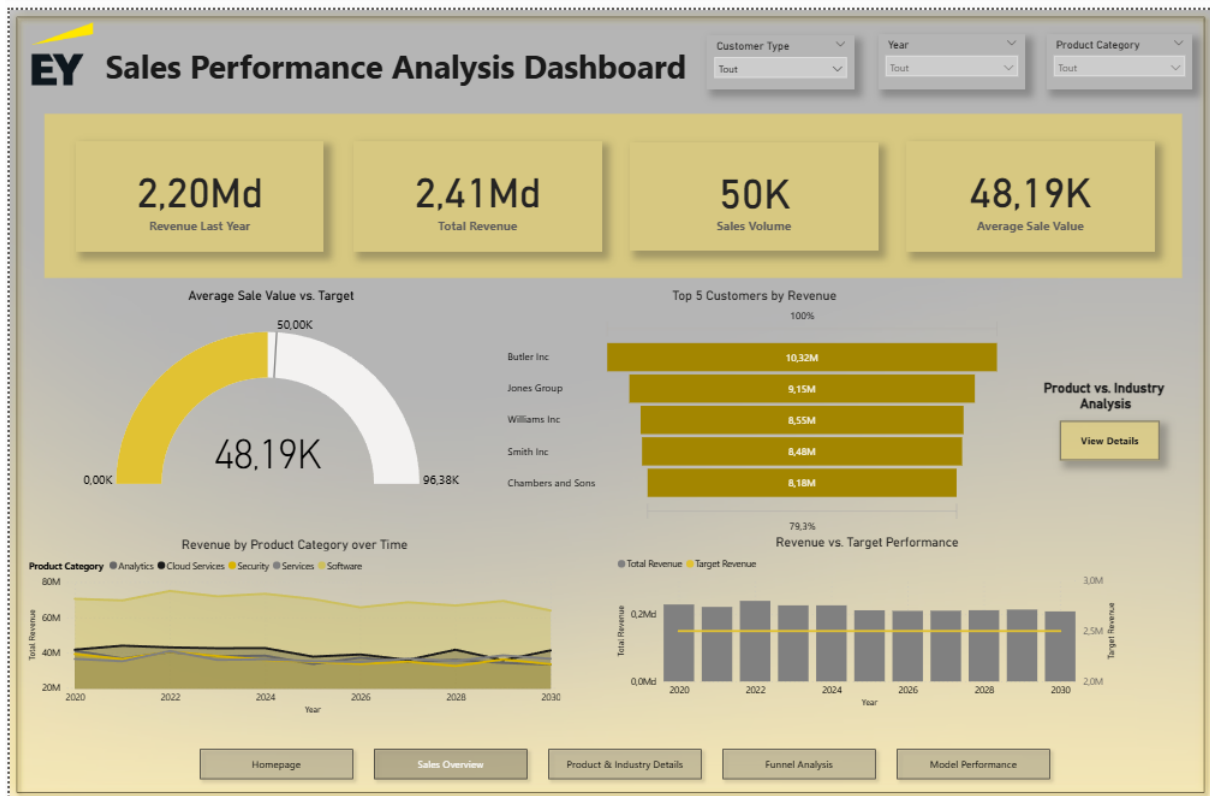


Figure 57: Sales Performance Analysis Dashboard

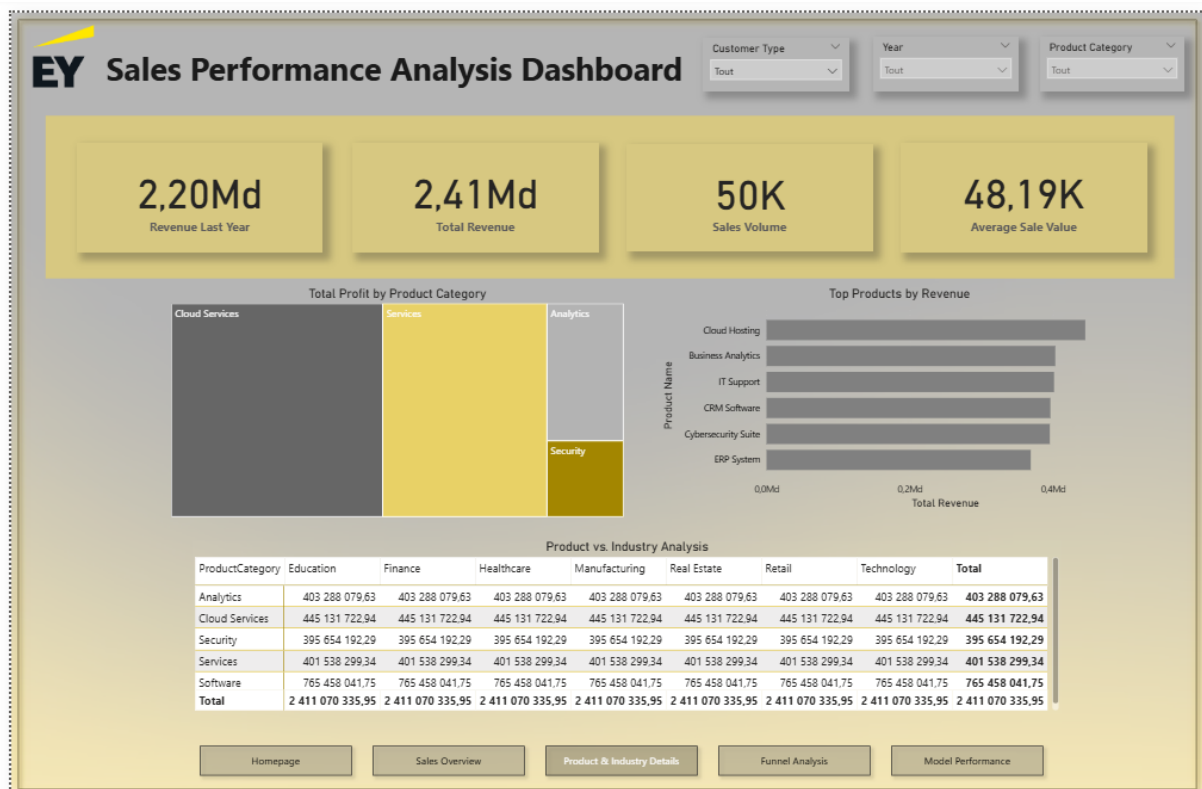


Figure 58: Sales Performance Analysis Dashboard Details

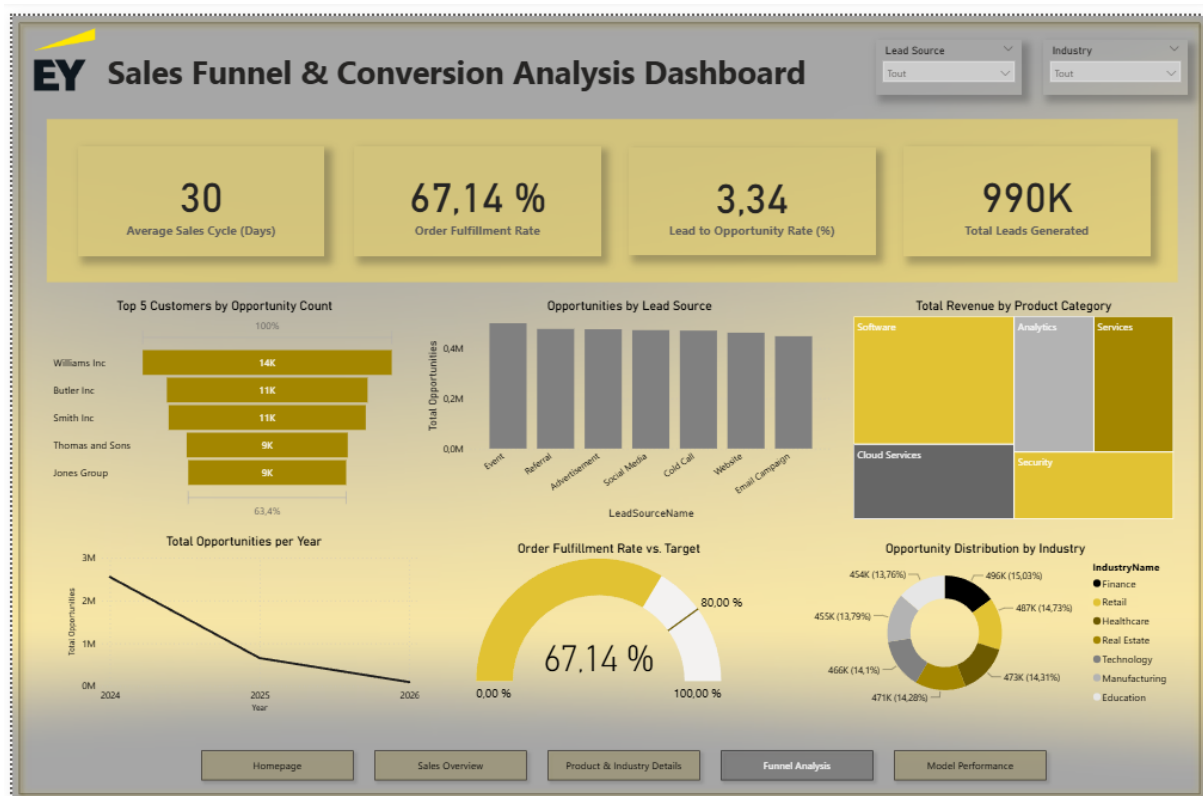


Figure 59: Sales Funnel and Conversion Analysis Dashboard

5.2.3 Predictive Model Performance Dashboard

This dedicated dashboard offers full transparency and comprehensive insights into the performance of the machine learning model. It tracks crucial metrics such as prediction accuracy, precision, recall, and F1-score, providing a clear picture of the model's reliability. Furthermore, the dashboard includes features for identifying the key drivers behind predictions, explaining why certain quotes are likely to be approved or rejected. This explainability fosters trust among stakeholders, enabling them to confidently leverage the model's decisions for proactive sales management and strategy refinement.

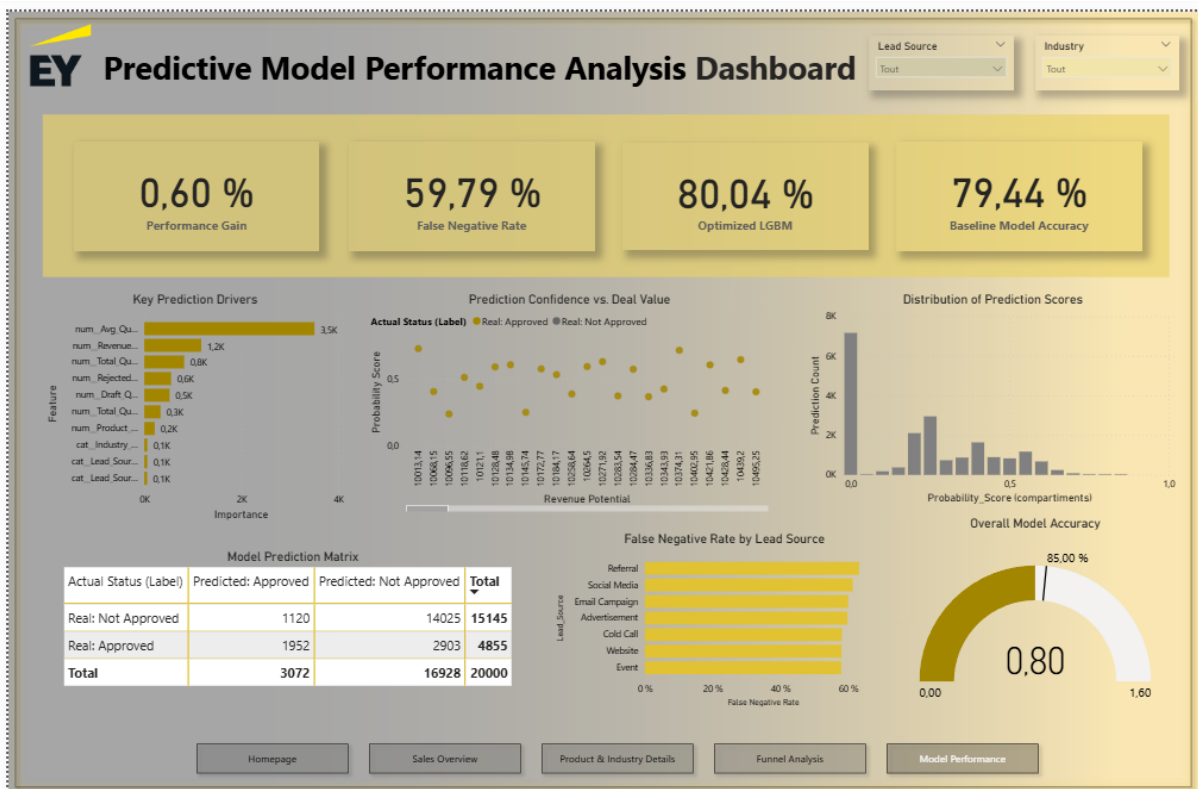


Figure 60: Predictive Model Performance and Explainability Dashboard

Chapter 6: The CRM BI Web Interface: A Centralized Hub

This chapter showcases the custom web application built with ASP.NET Core. This interface serves as the project's centerpiece, unifying all backend components into a single, cohesive, and user-friendly experience.

6.1 User Onboarding and Access

User access to the CRM BI Web Interface is initiated through a secure login page, designed to protect sensitive business data. Upon successful authentication, users are directed to a welcoming page that provides an initial overview of the application's capabilities. To facilitate adoption and empower non-technical users, a comprehensive, multi-part user guide is integrated directly into the application, ensuring a smooth onboarding experience by clearly outlining navigation, features, and support resources.

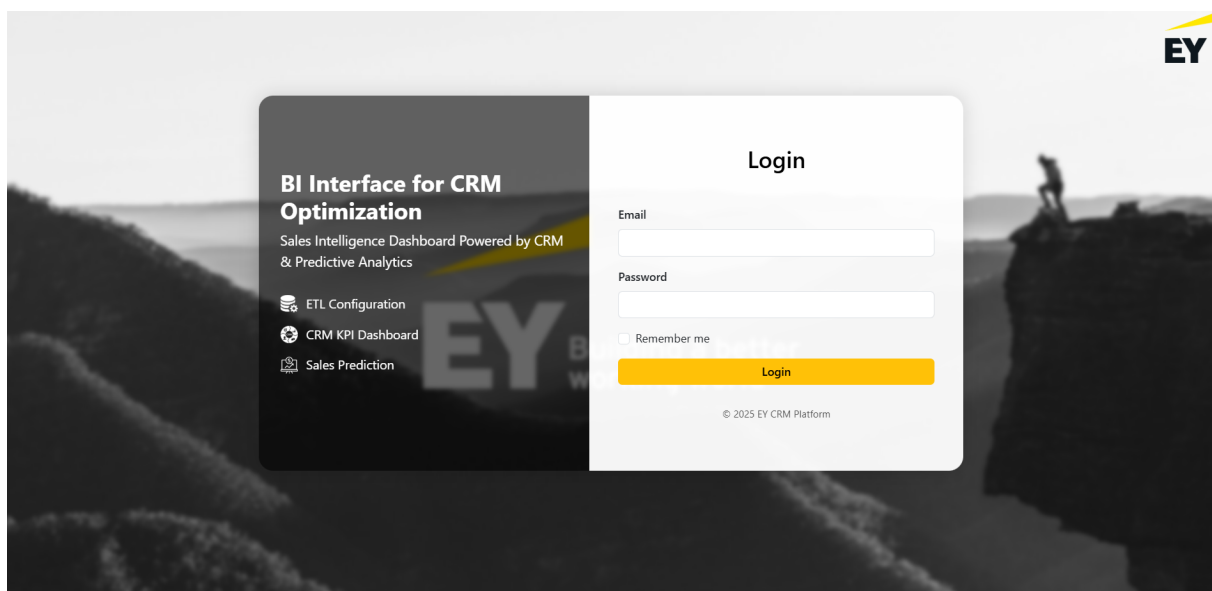


Figure 61: Secure Login Page for the BI Interface

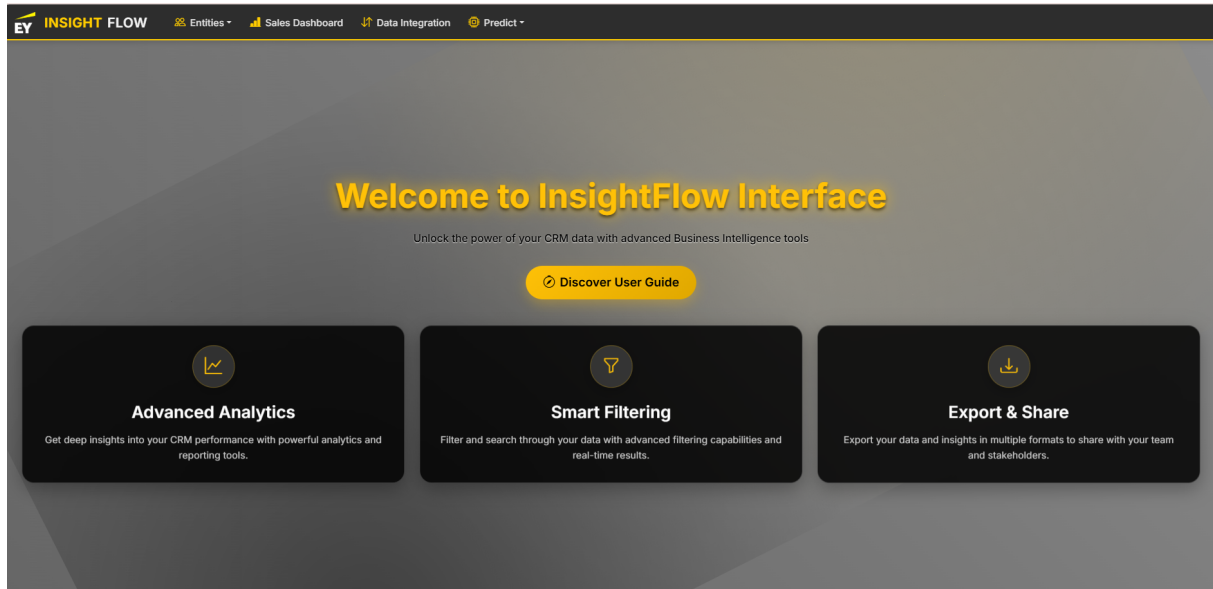


Figure 62: The Welcome Page for New Users

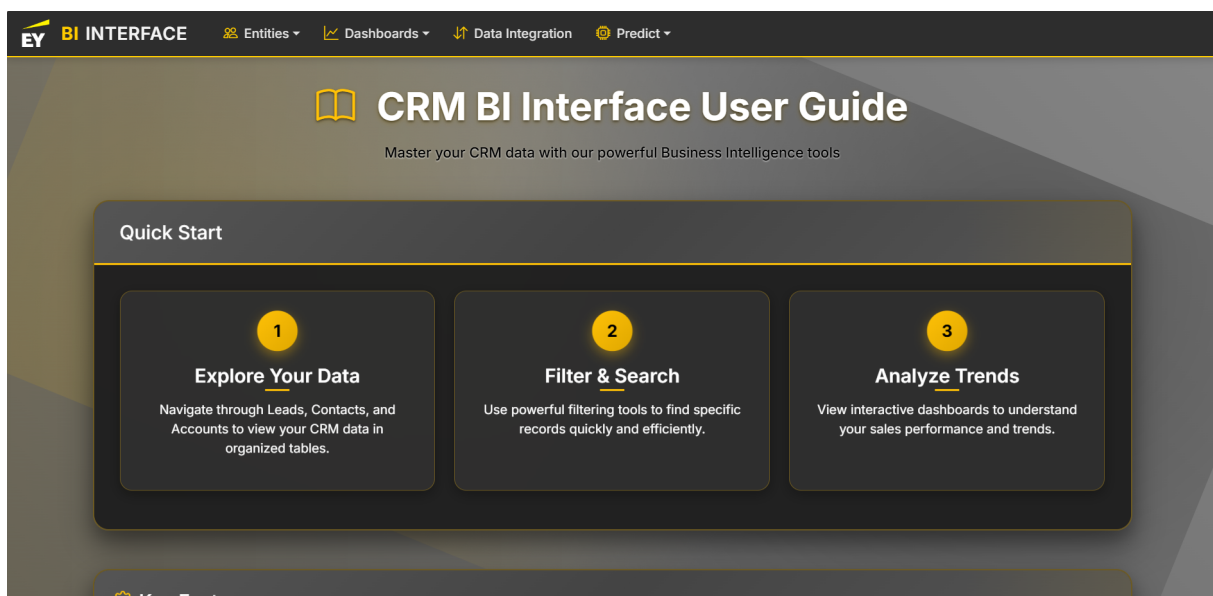


Figure 63: User Guide - Part 1: Quick Start

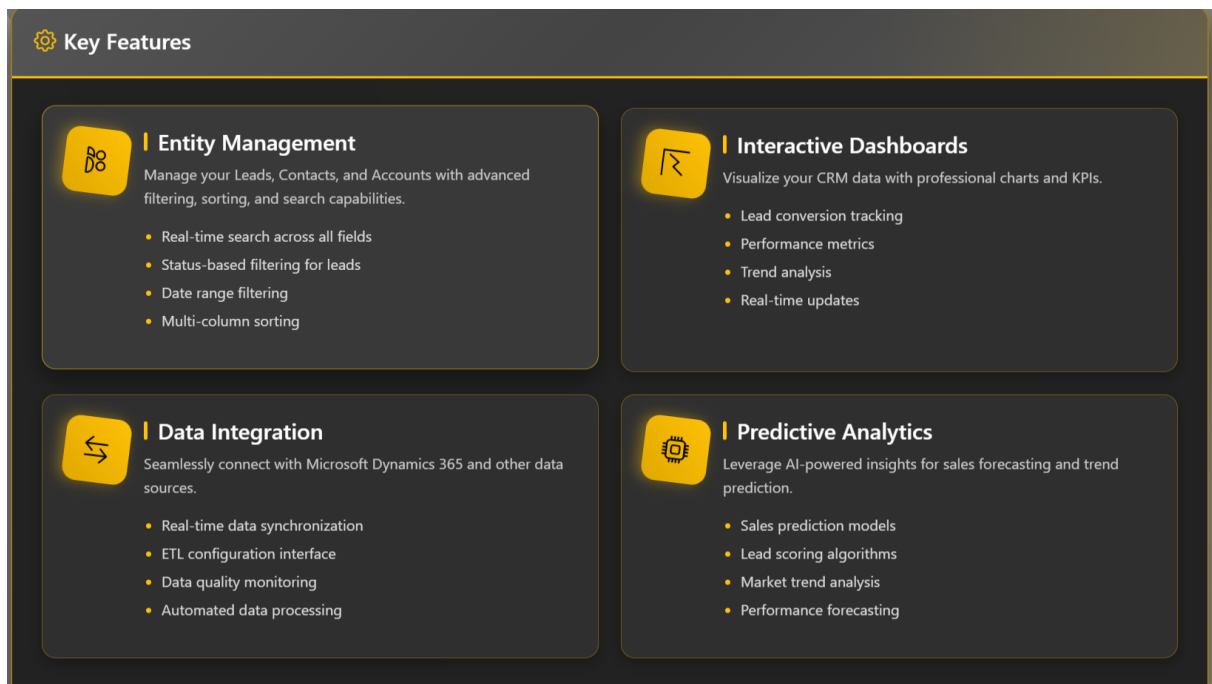


Figure 64: User Guide - Part 2: Key Features

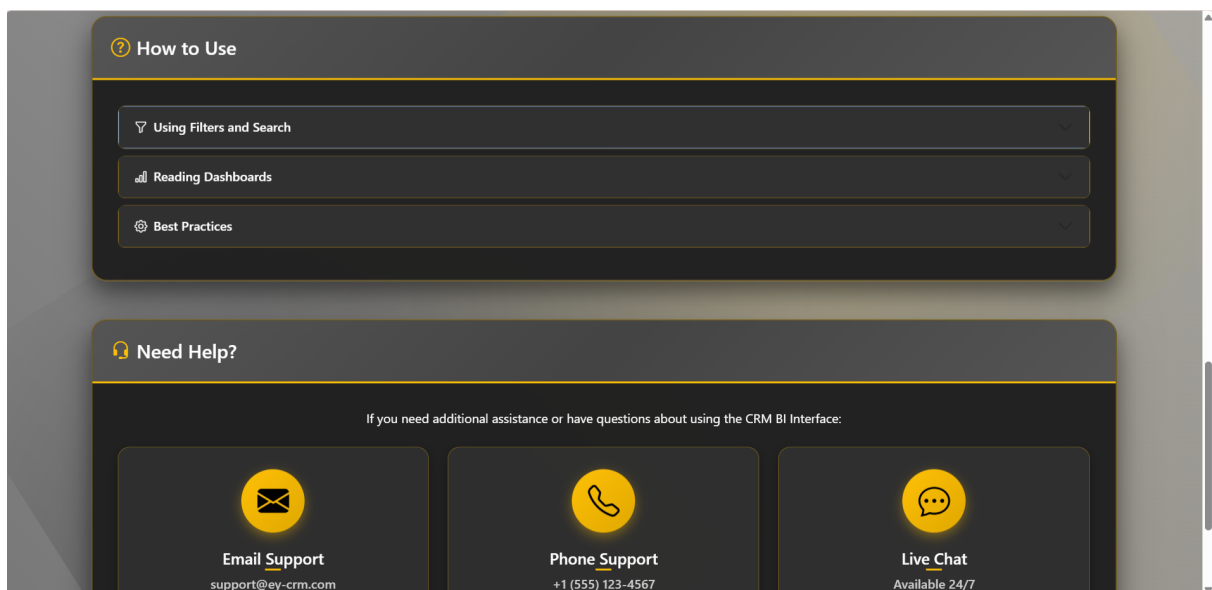


Figure 65: User Guide - Part 3: Help and Support

6.2 Core Application Features

6.2.1 Data Exploration ('Entities' Tab)

The 'Entities' tab offers a powerful and intuitive interface for data exploration, providing business users with direct, self-service access to the underlying CRM data. From a clearly organized navigation menu, users can select any entity (e.g., Quotes, Leads, Accounts) to view a filterable list of records. This functionality allows for quick searches and granular analysis, with the ability to drill down into the detailed view of a specific item, revealing all associated attributes and relationships for comprehensive understanding.

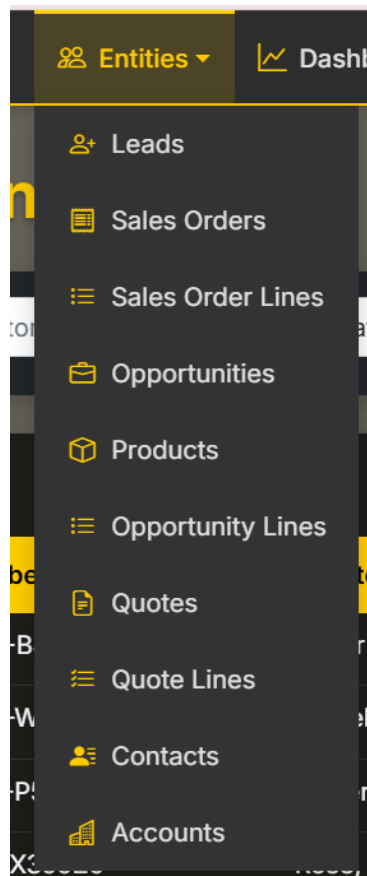


Figure 66: Navigation Menu for Entity Selection

6.2.2 On-Demand ETL ('Data Integration' Tab)

This innovative 'Data Integration' panel significantly empowers business users by allowing them to manage the data refresh process on-demand, without requiring technical intervention. Users can initiate the execution of SSIS packages with a single click, triggering the ETL pipeline to update the Data Warehouse with the latest CRM data.

The interface provides real-time feedback on package execution status, displaying progress and completion messages, ensuring transparency and control over the data synchronization process.

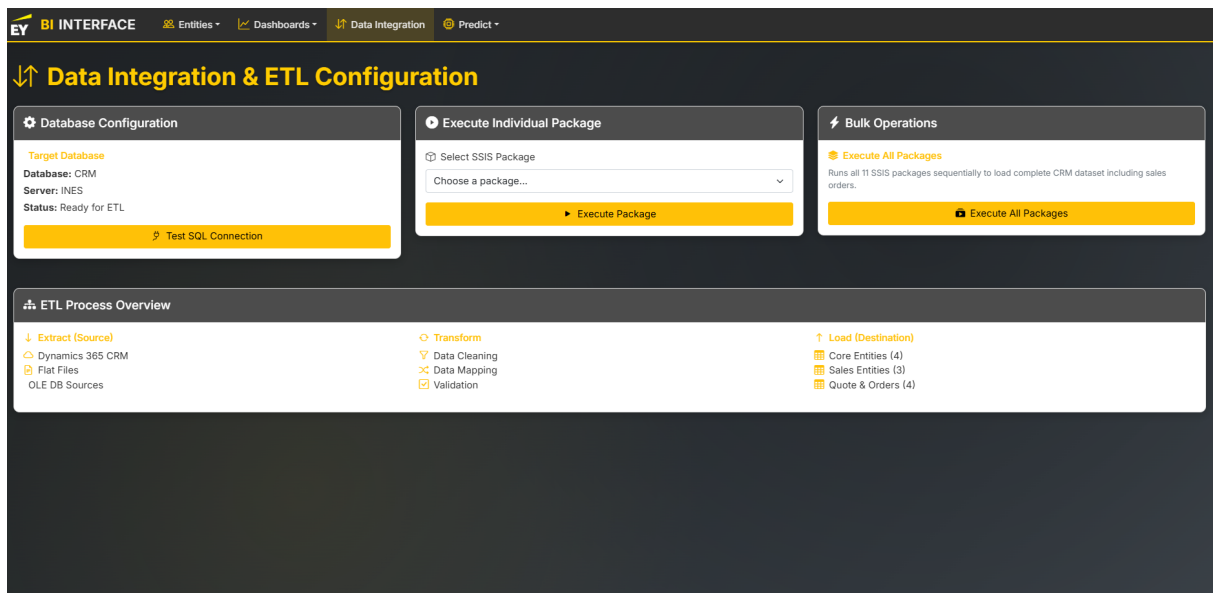


Figure 69: ETL Control Panel for On-Demand Package Execution

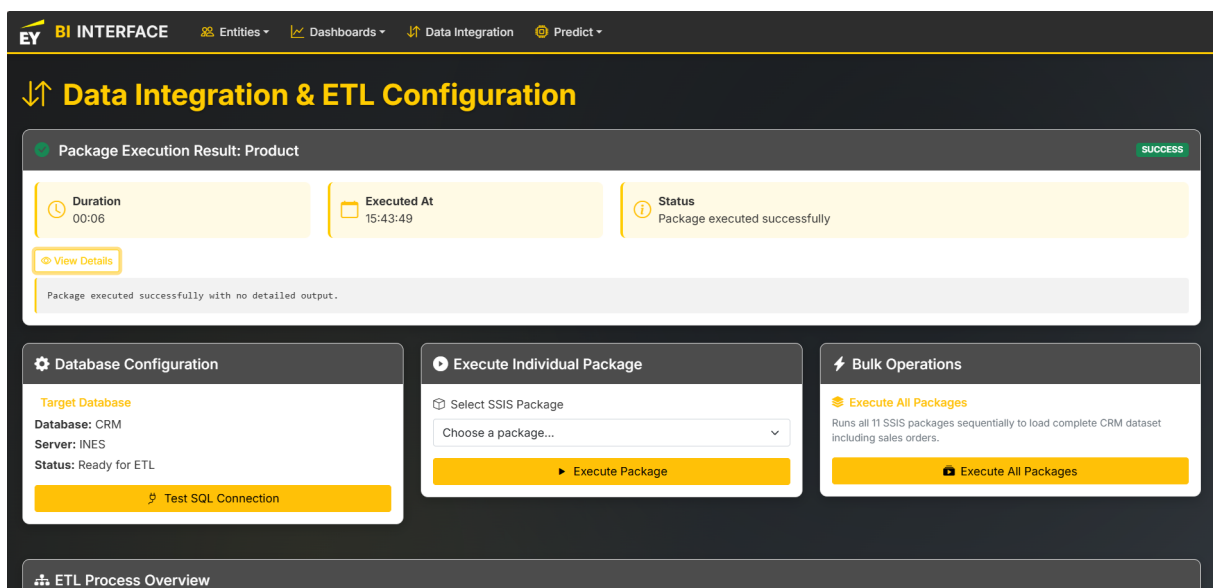


Figure 70: Real-Time Feedback after a Successful Package Execution

6.2.3 Real-Time Predictions ('Predict' Tab)

The 'Predict' tab is a cornerstone of the BI solution, hosting an interactive form where users can input details for new or pending sales quotes. Upon submission, the system seamlessly calls the optimized LGBM machine learning model, which processes the input features and instantly returns a prediction regarding the likelihood of the quote being approved, accompanied by a confidence score. This real-time predictive capability provides sales teams with immediate, data-driven insights, enabling proactive decision-making and strategic prioritization of efforts to maximize conversion rates.

The screenshot shows the 'Quote Approval Prediction - LGBM' form in the BI Interface. The form is titled 'Quote Approval Prediction - LGBM' and is described as 'Artificial Intelligence - Optimized LGBM Model'. It features a navigation bar with 'New Prediction', 'Results & Analysis', and 'Model Performance' tabs. The 'New Prediction' tab is active, showing a 'Prediction Form' with various input fields. The form is divided into two columns. The left column contains fields for 'Company Name' (Client en Or), 'Contact Name' (Sophie Bernard), 'Revenue Potential (€)' (250000), 'Industry Sector' (Finance), and 'Lead Source' (Referral). The right column contains fields for 'Number of Products' (8), 'Total Quantity' (400), 'Total Number of Quotes' (5), 'Rejected Quotes' (0), 'Draft Quotes' (0), 'Average Quote Value (€)' (240000), and 'Average value in euros (€)'. The form is styled with a dark theme and yellow accents.

Figure 71: Interactive Form for the Quote Approval Prediction Model

The screenshot shows the 'Quote Approval Prediction - LGBM' results page in the BI Interface. The page is titled 'Quote Approval Prediction - LGBM' and is described as 'Artificial Intelligence - Optimized LGBM Model'. It features a navigation bar with 'New Prediction', 'Results & Analysis', and 'Model Performance' tabs. The 'Results & Analysis' tab is active, showing a 'Prediction Result' section with a large green box displaying 'APPROVED' and a confidence score of '61,67%'. Below this, it says 'Model: LGBM-Optimized-v1.0'. To the right of the prediction result is a 'Risk Analysis' section with a 'Key Factors' and 'Recommendations' subsection. The page is styled with a dark theme and yellow accents.

Figure 72: Real-Time Prediction Result with Confidence Score

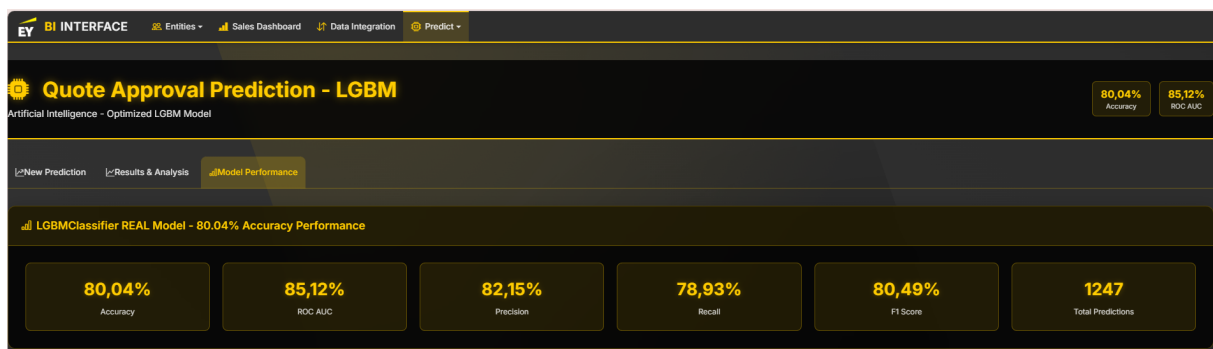


Figure 73: Live LGBM Model Performance Metrics in the BI Interface

Chapter 7: General Conclusion and Perspectives

This final chapter summarizes the project's achievements, reflects on lessons learned, and outlines the strategic vision for the solution's future.

7.1 Summary of Achievements

This project successfully delivered a comprehensive, end-to-end Business Intelligence solution. Key achievements include a fully integrated data backend (ETL and DWH), a high-accuracy predictive model (80.04%), and a professional web interface that unifies all components into a single, user-friendly platform. The project met all its core objectives, creating a powerful and scalable foundation for data-driven decision-making at EY.

7.2 Challenges and Lessons Learned

The primary obstacles were related to data quality and the complexity of CRM entity relationships. Key lessons learned include the value of an Agile methodology, the critical importance of data quality, and the necessity of a user-centric design to ensure adoption and maximize business impact.

7.3 Perspectives and Strategic Vision

This project is a starting point for a broader data-driven culture. The strategic vision includes:

- **Evolving from Predictive to Prescriptive AI:** Future models could recommend specific actions to improve outcomes.
- **Creating a True 360° Customer View:** The framework can be extended to integrate data from other sources.
- **Fostering a Data-Driven Culture:** Rolling out the application with user training will empower more teams to make decisions based on data.

This extensible framework positions EY to continue driving a culture of data-driven excellence.

Webography

- [Microsoft Learn: Nurture sales from lead to order](#)
- [KingswaySoft: SSIS Integration Toolkit for Microsoft Dynamics 365](#)
- [Microsoft Power Platform](#)
- [Microsoft Learn: SQL Server Integration Services \(SSIS\)](#)
- [Microsoft Learn: SQL Server Management Studio \(SSMS\)](#)
- [Google Cloud: What is machine learning?](#)
- [Stack Overflow: How to integrate Power BI in ASP.NET applications](#)
- [Microsoft Learn: C# documentation](#)
- [Microsoft Learn: Dynamics 365 documentation](#)
- [Microsoft Learn: Introduction to ASP.NET Core](#)
- [Microsoft Learn: Training for Power BI](#)



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