

CANADIAN TOURISM DATA COLLECTIVE

TECHNICAL FOUNDATIONS TO
BUILD DATA PRODUCTS AT SCALE

Three Isle Lake
Alberta



CANADIAN TOURISM DATA
collective



PETER DE RAMA

Executive Director, Data & Digital Innovation

Destination Canada

derama.peter@destinationcanada.com

CANADA*



ABOUT DESTINATION CANADA

Our Mandate

Sustain a **vibrant and profitable Canadian tourism** industry

Market Canada as a desirable travel destination

Support **cooperation** between the private sector and Canadian governments at all levels with respect to Canadian tourism

Provide **data and information** about Canadian tourism to the private sector and all levels of government



AGENDA

01

What is the Data Collective?

02

**Three Challenges in Enabling
Collaboration at Scale**

03

Key Takeaways

CANADA*



WHAT IS THE DATA COLLECTIVE?



CONCEPT

A national platform — centralized, accessible and secure — for tourism data, research and thought leadership.



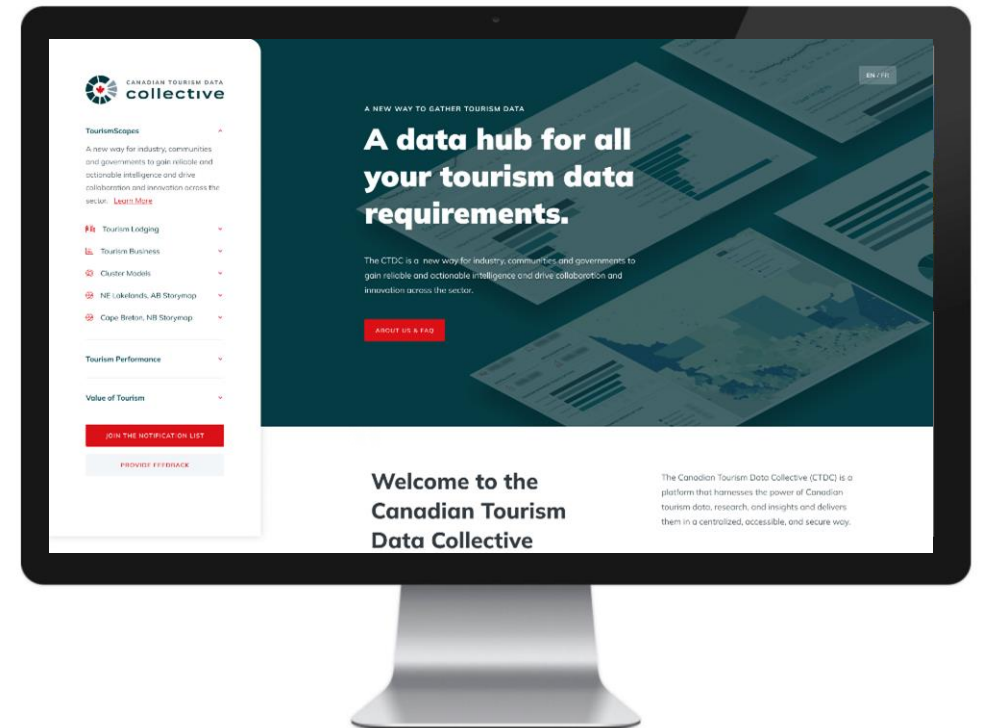
PURPOSE

A new way for industry, communities and governments to gain reliable and actionable intelligence and drive collaboration and innovation across the sector.



BIG WINS

A source of competitive advantage for Canada's hosting economy.



OUR DATA & TECHNOLOGY FOUNDATION



Secure and Protected

- Automatic encryption of data at rest and in transit
- Ability to redact sensitive data



Advanced Data and Analytics

- Modern data warehouse
- Enterprise-grade Artificial Intelligence services



Data Management and Governance

- Intelligent data fabric
- Data catalog, glossary

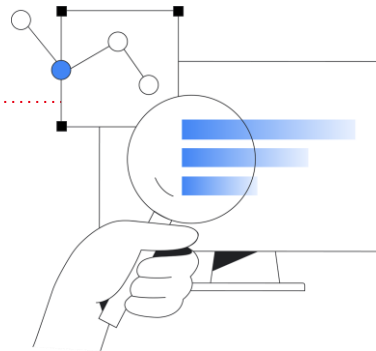


Ease of Integration

- Integration with other public clouds
- Google Marketing Platform integration



Google Marketing Platform

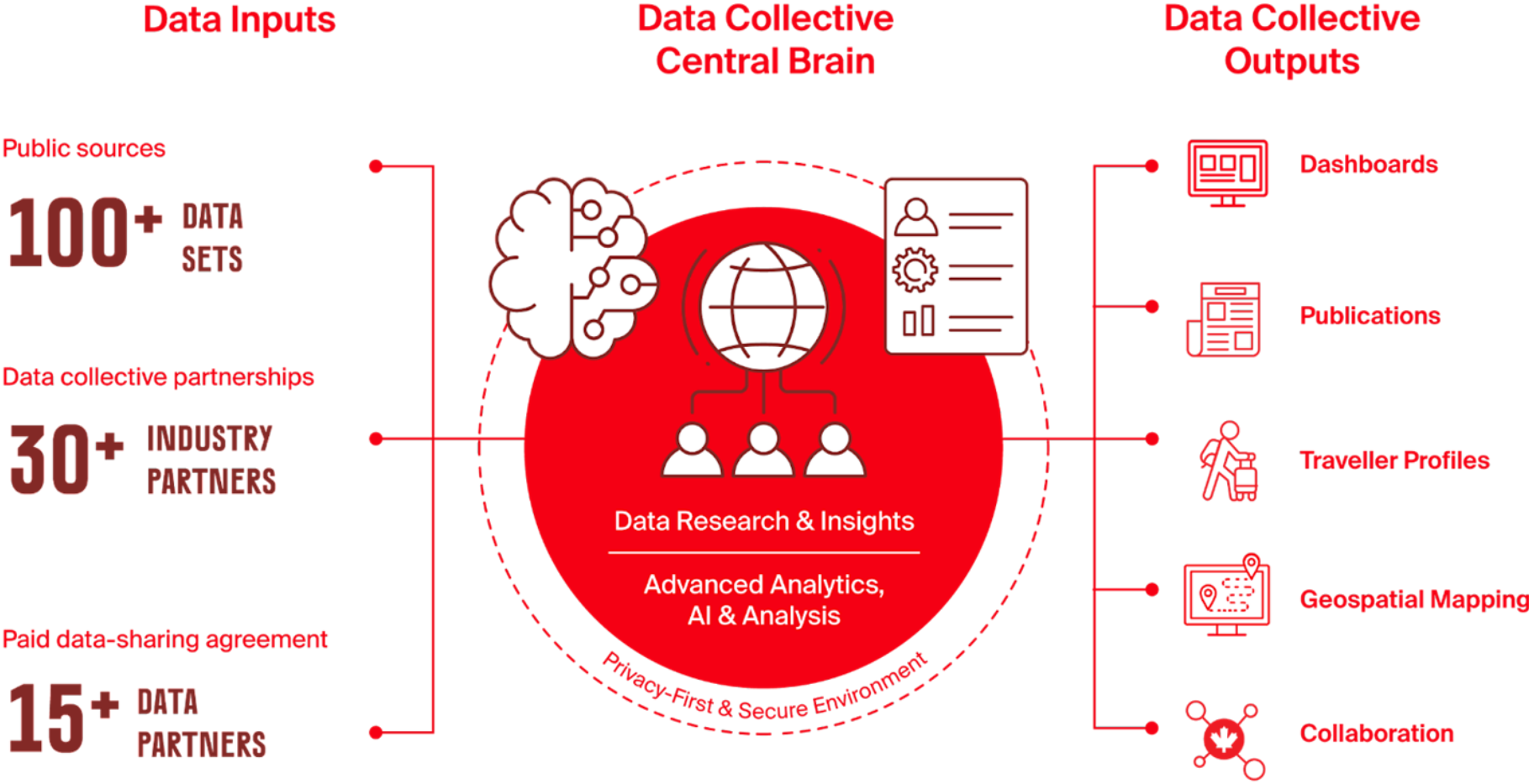


Unified Data Intelligence Platform



Google Cloud Platform

HOW THE DATA COLLECTIVE WORKS



Collect

Connect

Communicate

Collaborate & Co-Create

ENABLING COLLABORATION AT SCALE

Data Inputs

Public sources

CHALLENGE 1

BUILD-IN QUALITY

Data collective partnerships

How might we continuously monitor data quality?

15+ DATA PARTNERS

Data Collective Central Brain

CHALLENGE 2

LEVERAGE AUTOMATION

How might we leverage automation to provide efficiencies?

Data Collective Outputs

Dashboards

CHALLENGE 3

ENABLE COLLABORATION

How might we enable multiple teams to build data products securely?

CHALLENGE

1

HOW MIGHT WE CONTINUOUSLY MONITOR DATA QUALITY?

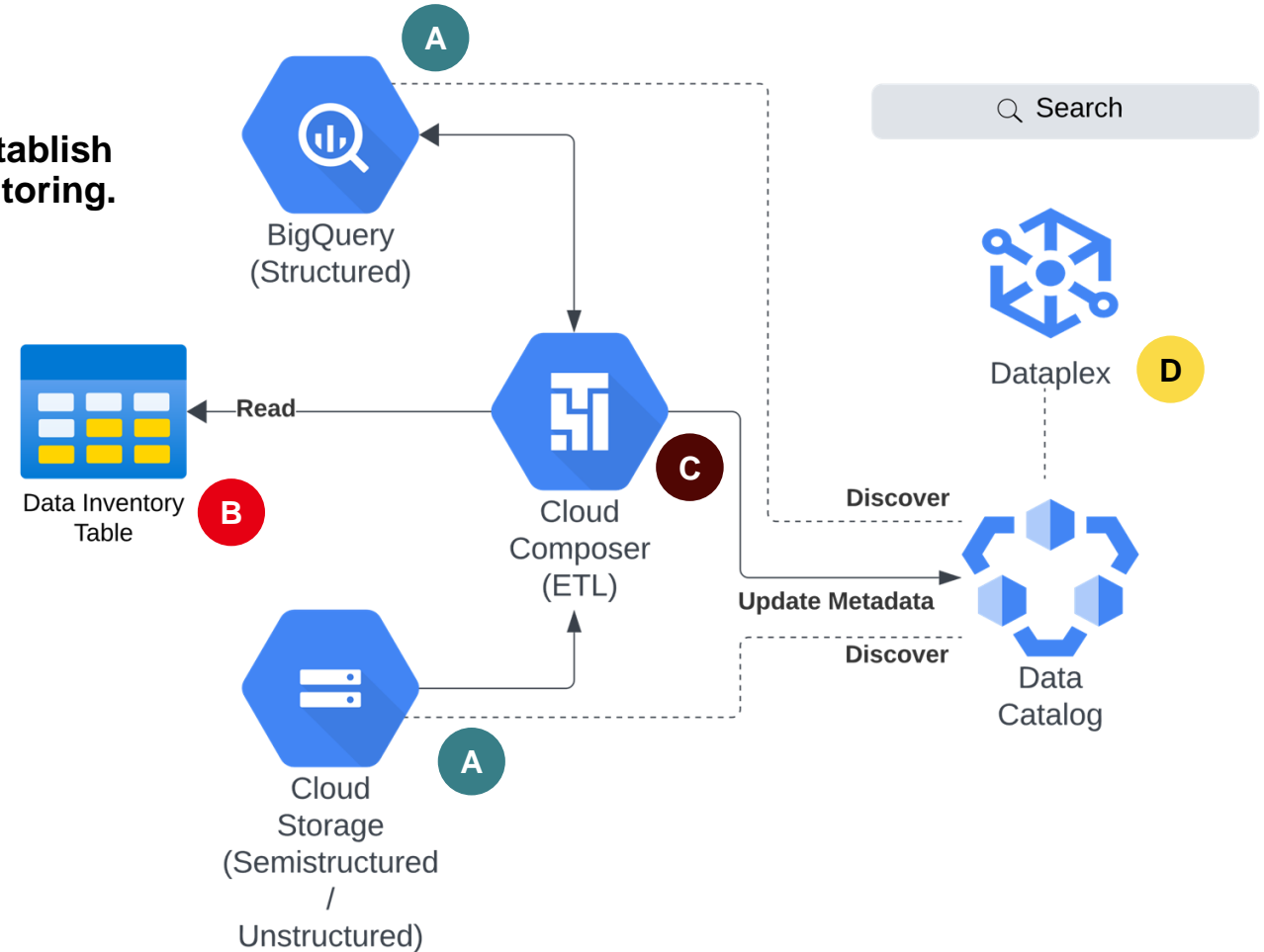
Leveraging the Cloud's automated data discovery, metadata management, and data governance capabilities enabled us to establish patterns that ensure built-in quality checks and continuous monitoring.

A Data assets automatically discovered and catalogued.

B Data inventory adds additional metadata.

C Data quality metrics updated as data is processed.

D The entire catalogue is searchable.



HOW MIGHT WE CONTINUOUSLY MONITOR DATA QUALITY?

Standardized metadata tagging framework helps with data discovery

data_governance	
Display name	Value
Business Owner	Michel
Data Governor	DC
License	FREE
Licenses	FREE

data_quality	
Display name	Value
Number of Columns	8
Number of Rows	573813
Completeness Percentage	1.00

meta_data	
Display name	Value
Categories	Tourism Demand
Category	Tourism Demand
Data Source	landing_statscan.frontier_vehicle_traffic_country
Description	Non-resident visitors entering Canada, by country of residence, mode of transportation, arrival type and traveller type
Sub-Categories	Arrivals or Visits - International

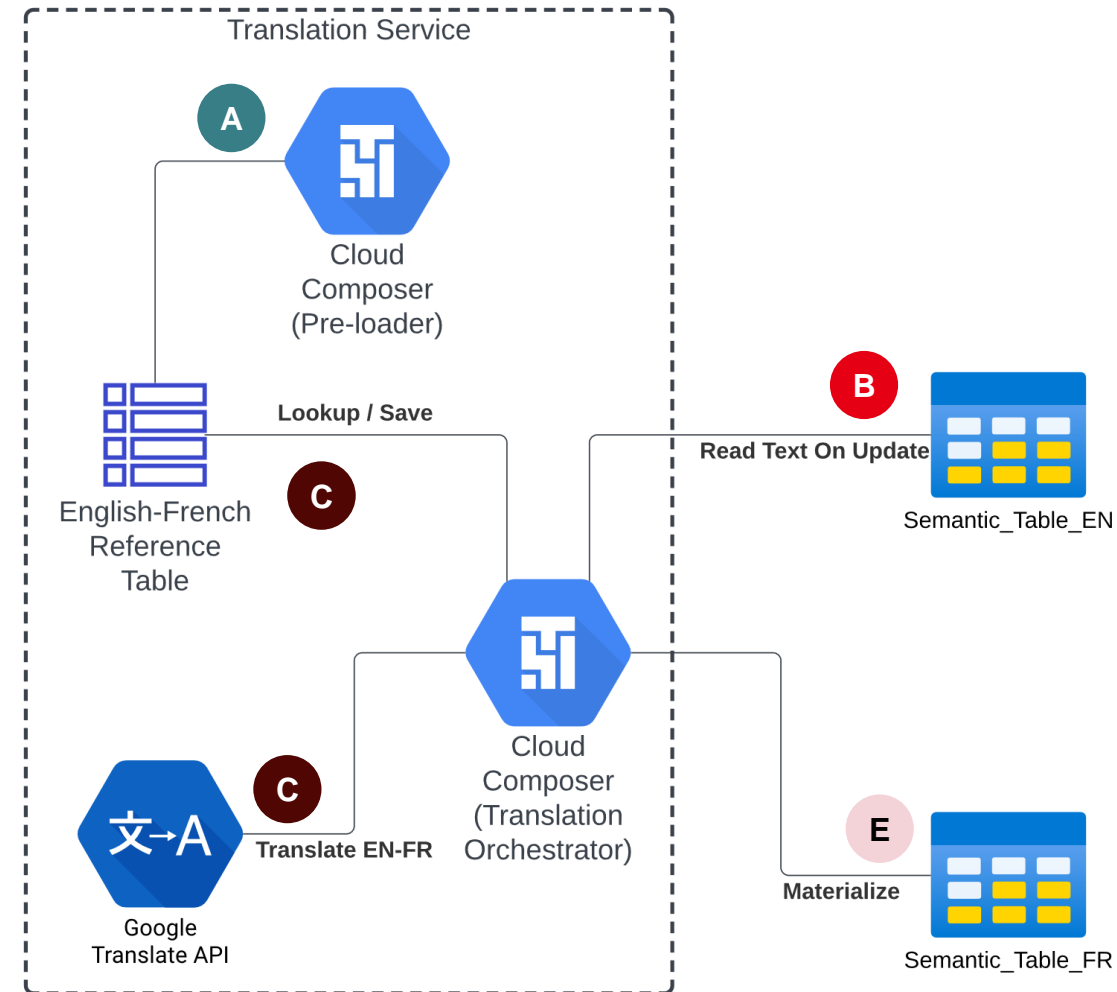
Data quality checks are performed when data is refreshed.

Column name ↑	Rule type	Status	Dimension	Failed rows	Threshold
date	Null Check	✓ Passed	Completeness	0%	100%
destination	Null Check	✓ Passed	Completeness	0%	100%
destination	Value Set Check	✓ Passed	Validity	0%	100%
destination	Row Condition Check	✓ Passed	Validity	0%	100%
infosite_pageviews	Null Check	✓ Passed	Completeness	0%	100%
infosite_pageviews	Value Set Check	✓ Passed	Validity	19.53%	80%
origin	Null Check	❌ Failed	Completeness	32.17%	100%
origin	Row Condition Check	✓ Passed	Validity	0%	100%

HOW MIGHT WE LEVERAGE AUTOMATION TO PROVIDE EFFICIENCIES?

Using Artificial Intelligence services like Google Translate API greatly reduced the effort it takes for data products to conform to Canada's Official Languages Act.

- A** Data available in French is preloaded.
- B** Unique text is read from English tables.
- C** English text is translated to French if it does not exist.
- D** A human in the loop can review and override a translation.
- E** A schema-equivalent French table is materialized and maintained.



HOW MIGHT WE LEVERAGE AUTOMATION TO PROVIDE EFFICIENCIES?

English and French table schemas are identical which simplifies creation of visualization, reports and other data products in both languages.

SELECT FROM ENGLISH TABLE

Row	traveller_type	mode_of_transportation	arrival_type	destination_country	destination_province	destination_sub_province
1	Tourists (overnight)	Water	From another country via the U...	Canada	Newfoundland and Labrador	Labrador
2	Excursionists (same-day)	Water	From another country direct	Canada	Newfoundland and Labrador	Labrador
3	Tourists (overnight)	Air	From another country via the U...	Canada	Newfoundland and Labrador	Labrador
4	Tourists (overnight)	Air	From another country direct	Canada	Newfoundland and Labrador	Labrador
5	Excursionists (same-day)	Air	From another country direct	Canada	Newfoundland and Labrador	Labrador
6	Excursionists (same-day)	Water	From another country direct	Canada	Newfoundland and Labrador	Labrador
7	Tourists (overnight)	Air	From another country direct	Canada	Newfoundland and Labrador	Labrador
8	Tourists (overnight)	Air	From United States of America ...	Canada	Newfoundland and Labrador	Labrador
9	Tourists (overnight)	Water	From another country direct	Canada	Newfoundland and Labrador	Labrador
10	Tourists (overnight)	Air	From another country via the U...	Canada	Newfoundland and Labrador	Labrador

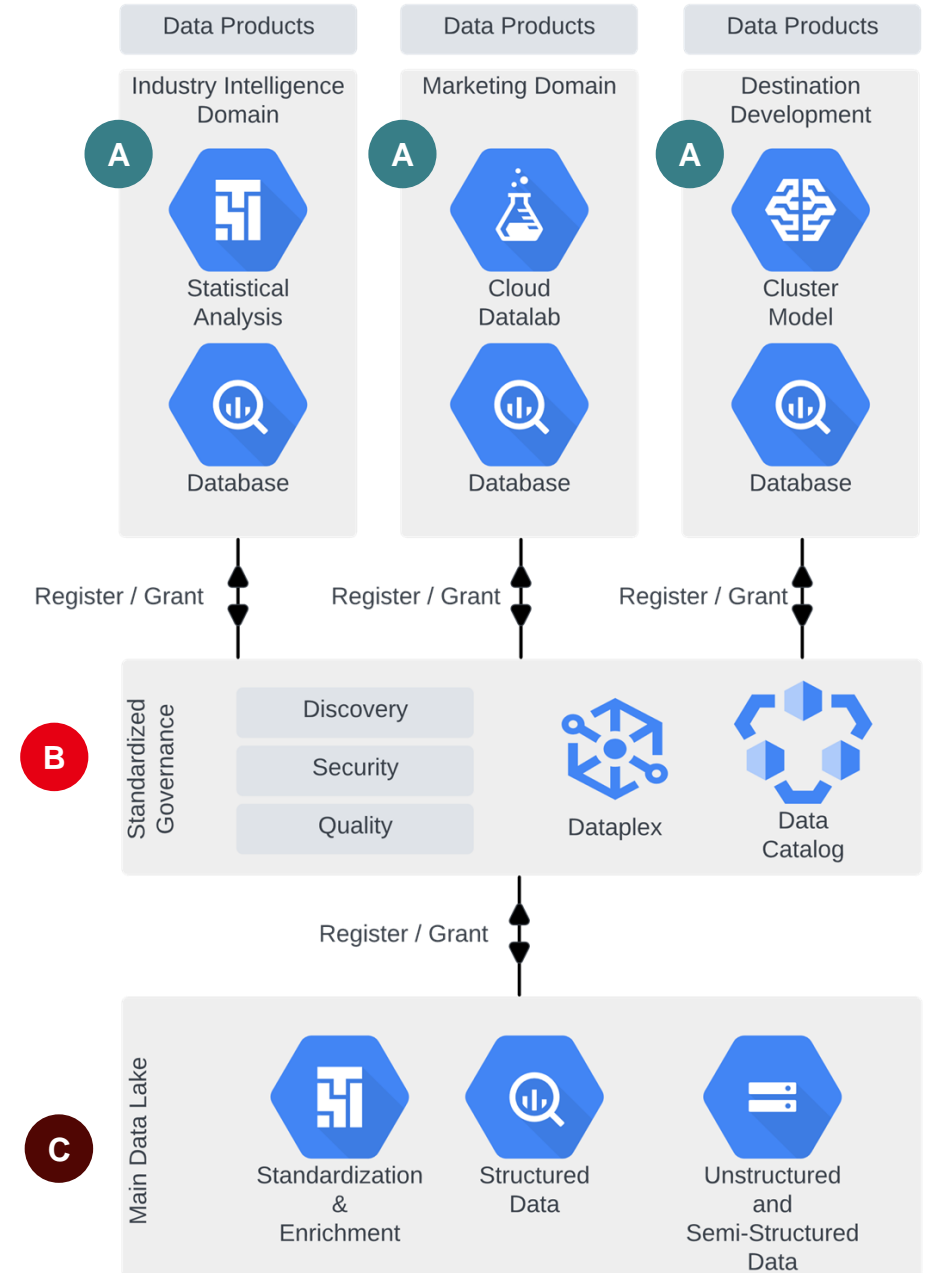
SELECT FROM EQUIVALENT FRENCH TABLE

Row	traveller_type	mode_of_transportation	arrival_type	destination_country	destination_province	destination_sub_province
1	Touristes (avec nuitées)	Voie maritime	D'un autre pays via les États-Un...	Canada	Terre-Neuve-et-Labrador	Labrador
2	Touristes (avec nuitées)	Voie aérienne	D'un autre pays via les États-Un...	Canada	Terre-Neuve-et-Labrador	Labrador
3	Excursionnistes (même jour)	Voie aérienne	D'un autre pays via les États-Un...	Canada	Terre-Neuve-et-Labrador	Labrador
4	Excursionnistes (même jour)	Voie maritime	D'un autre pays direct	Canada	Terre-Neuve-et-Labrador	Labrador
5	Excursionnistes (même jour)	Voie aérienne	D'un autre pays direct	Canada	Terre-Neuve-et-Labrador	Labrador
6	Touristes (avec nuitées)	Voie maritime	D'un autre pays direct	Canada	Terre-Neuve-et-Labrador	Labrador
7	Touristes (avec nuitées)	Voie aérienne	Des États-Unis d'Amérique seul...	Canada	Terre-Neuve-et-Labrador	Labrador
8	Excursionnistes (même jour)	Voie aérienne	D'un autre pays direct	Canada	Terre-Neuve-et-Labrador	Labrador
9	Excursionnistes (même jour)	Voie maritime	Des États-Unis d'Amérique seul...	Canada	Terre-Neuve-et-Labrador	Labrador
10	Touristes (avec nuitées)	Voie maritime	Des États-Unis d'Amérique seul...	Canada	Terre-Neuve-et-Labrador	Labrador

HOW MIGHT WE ENABLE MULTIPLE TEAMS TO BUILD DATA PRODUCTS SECURELY?

By applying Data Mesh architectural principles to our data and analytics platform, we enable domain teams the capability to build data products on trusted data sources and reduce reliance on central data teams.

- A** Self-service analytics projects provided for domain teams with expertise.
- B** Standardized governance model is provided for domain teams to consume and share data.
- C** Specialized data engineering team maintain the main data lake and sets standards.



HOW MIGHT WE ENABLE MULTIPLE TEAMS TO BUILD DATA PRODUCTS SECURELY?

The architecture allows for a data exchange for data providers and data consumers to connect and exchange data in a seamless and secure manner in the future.

Illustrative Tourism Data Exchange

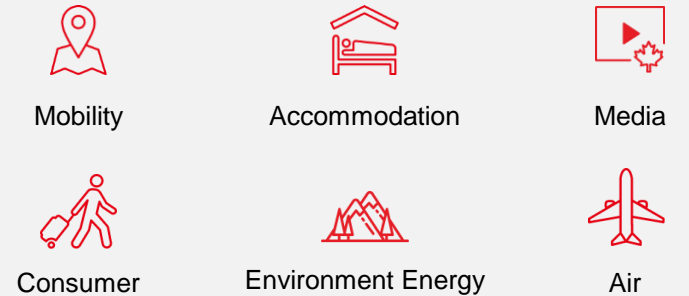
Founding Partners



Association & Key Commercial Partners



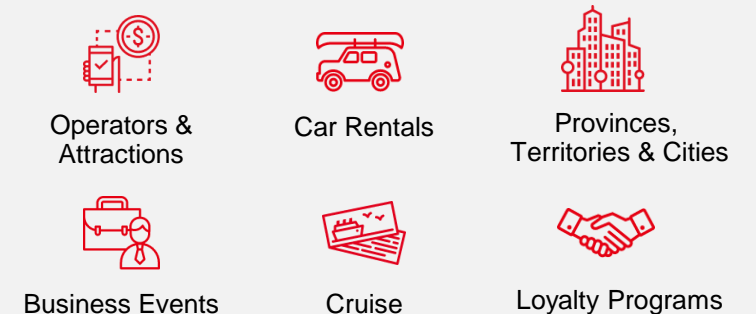
Commercial and Industry Exchanges



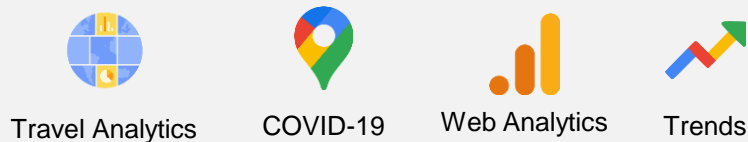
Public Exchanges



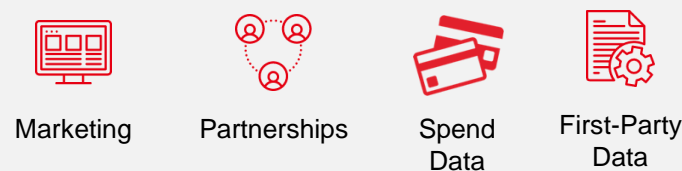
Private Exchanges



Marketplace Exchanges



Internal Exchanges

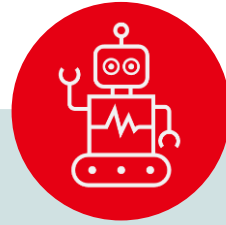


KEY TAKEAWAYS



BUILD-IN QUALITY

Integrating quality monitoring into your platform is essential for establishing trust in your data products.



LEVERAGE AUTOMATION

While embracing automation, including AI, can appear daunting initially, its strategic integration into operational processes promises substantial long-term benefits.



ENABLE COLLABORATION

Teams with domain expertise understand both data and user needs, making it essential for modern data and analytics systems to empower such teams for effective product development.



THANK YOU!

THANK YOU!

