LTIMindtree

Whitepaper

Automating BI Migration using AI and Automation

Author: **Animesh Palit**

LTIMindtree

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BI Migration and its Perils

BI Market growth momentum is not slowing anytime soon. As per the Mordor, Intelligence Industry report, the Business Intelligence (BI) Market is expected to reach **USD 40.50 billion** by **2026** and grow at a **CAGR of 12%** over the forecast period (2021-2026). Most of this growth is driven by BI modernization initiatives. There are several factors that are driving the BI modernization initiatives including cost reduction, better visualizations, better user experience, improved self-service capabilities, cloud and SaaS technology adoption directives.

Often the adoption of new business intelligence tools commences with the rationalization of the existing reporting inventory followed by the migration of reports and dashboards in the current business intelligence tools to new business intelligence tools, with no or minor changes.

BI migration initiatives are complex and marred with challenges. Often, we encounter the following challenges during the BI migration lifecycle:

Knowledge Base

Lack of documentation on legacy BI implementations to facilitate reverse engineering.

Source System Drift

Drift in the reporting data source database schema and data. In most cases, Data Warehouse migration from legacy databases (Teradata, Oracle, Netezza, SQL Server) to Cloud databases (Snowflake, Databrick, Azure Synapse, Google BigQuery, AWS Redshift) warehouse migration to cloud data warehouse precedes BI migrations.

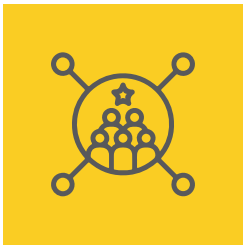
Magnitude of Migration

The number of reports and related objects to be migrated from legacy BI tools is often too large and makes a manual attempt to deduplicate, rationalize, and migrate not feasible.

BI Migration Automation

The difference in BI product architecture and features between legacy and new BI tools makes it challenging to automate the migration.

Examples: All visuals/charts in legacy BI tools will not be supported in new BI tools.

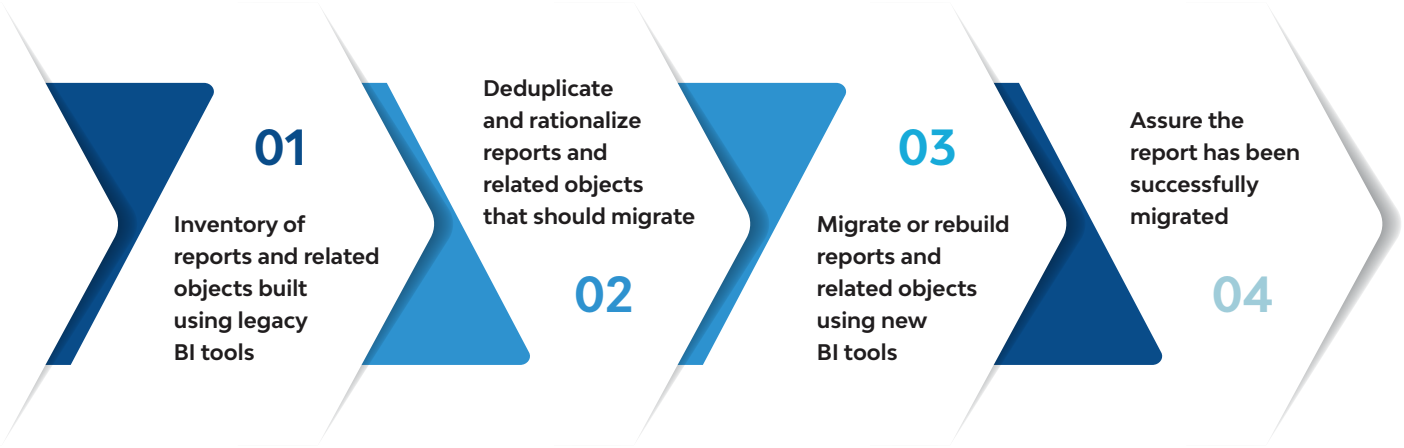


Talent Pool

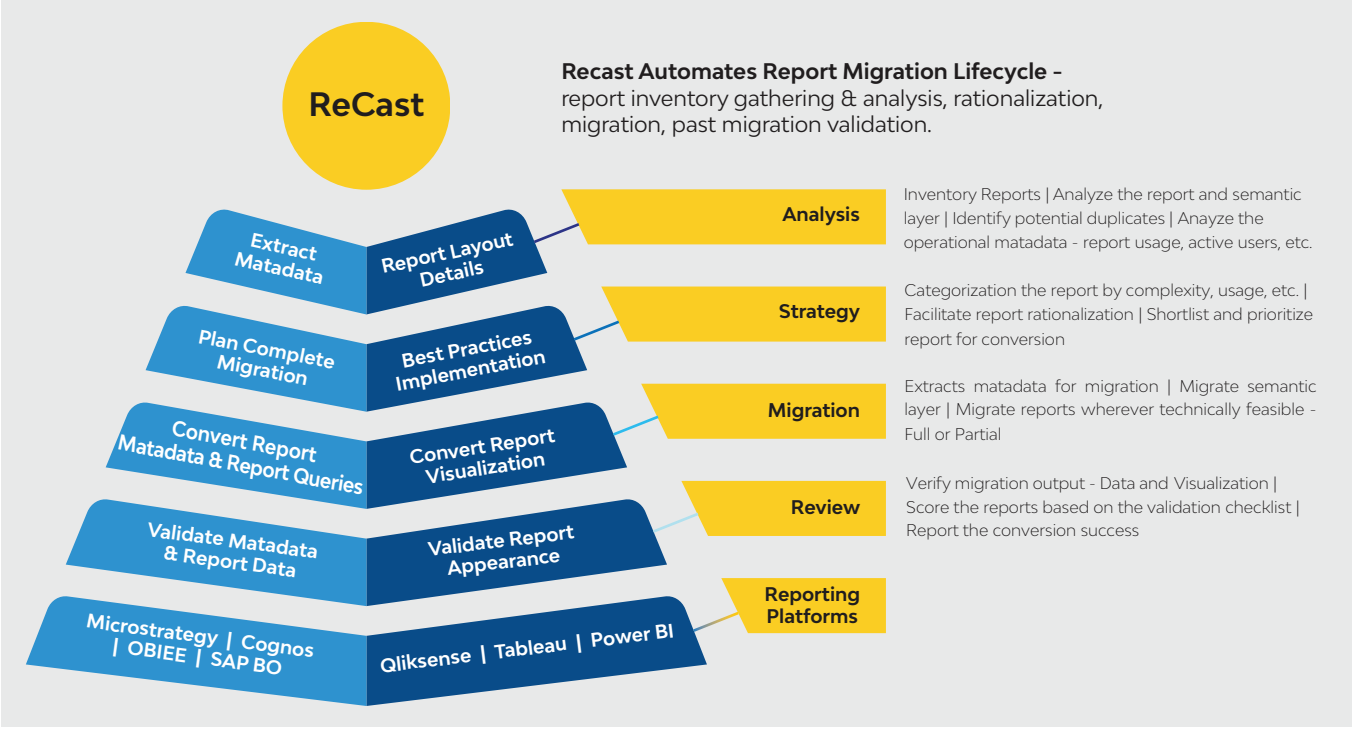
Lack of BI migration automation solution increases the dependency on BI Developers.
BI Developers with knowledge and skill in legacy and new BI tools are limited in the Talent market.

Automating BI Migration using LTIMindtree Recast

A typical BI migration project is executed in four sequential steps:



LTIMindtree has leveraged RPA and AI technologies to develop a BI migration automation tool, LTIMindtree Recast. Canvas Recast automates report migration lifecycle - report inventory gathering & analysis, rationalization, migration, and post-migration validation.



LTIMindtree Recast Analyzer:

Analysis of source system and rationalization of legacy BI landscape

BI Migration starts with analyzing the source BI tool, extracting all details of BI, like data source, data model, fact, dimension, filter, SQL, dependencies, and visual elements. LTIMindtree Recast uses various approaches, like API, SDK, XML or JSON dump, HTML analysis, and many others, to fetch report details. Most BI tool have Rest APIs for extracting data, except for visualization experience. LTIMindtree Recast uses AI-based Computer Vision technique for visual extraction, where API or SDK does not provide whole details. After extracting the data ReCast tool gives a more rational experience.

Commonality detection algorithm

Find the set of all similar reports in various file paths across the project. We developed our state-of-the-art algorithms based on data source tables, columns, filters, visualization, and GUI filter to ranking report commonalities with clusters.

- Fetch all the reports using the same set of tables. Give a unique cluster name for each set. Allocate 50% commonality for each report within a cluster.
- In a cluster of reports, fetch the same columns used in various reports. On match allocate 70%.
- Similarly filter, dimension, visualization, and GUI filter matching propagate 80%, 90% towards 100 % match between two reports.

Complexity analysis algorithm

Complexity is attributed to a report on various factors like multiple data sources, multiple SQL, complex matrix calculations, numbers of visualizations, and many other factors. A customizable template allows tunning the complexity calculation as per the project requirements.

Variable dependency analysis

An introspection of data model variables dependency shows the hierarchy and pinpoints the excess variables and unused variables.

BI element lineage

A lineage model of semantic data layer - Report, Tables, Columns, Matrix, SQL, Visualization, etc., on a graph database, gives clear visualization of re-engineering strategy of BI landscape.

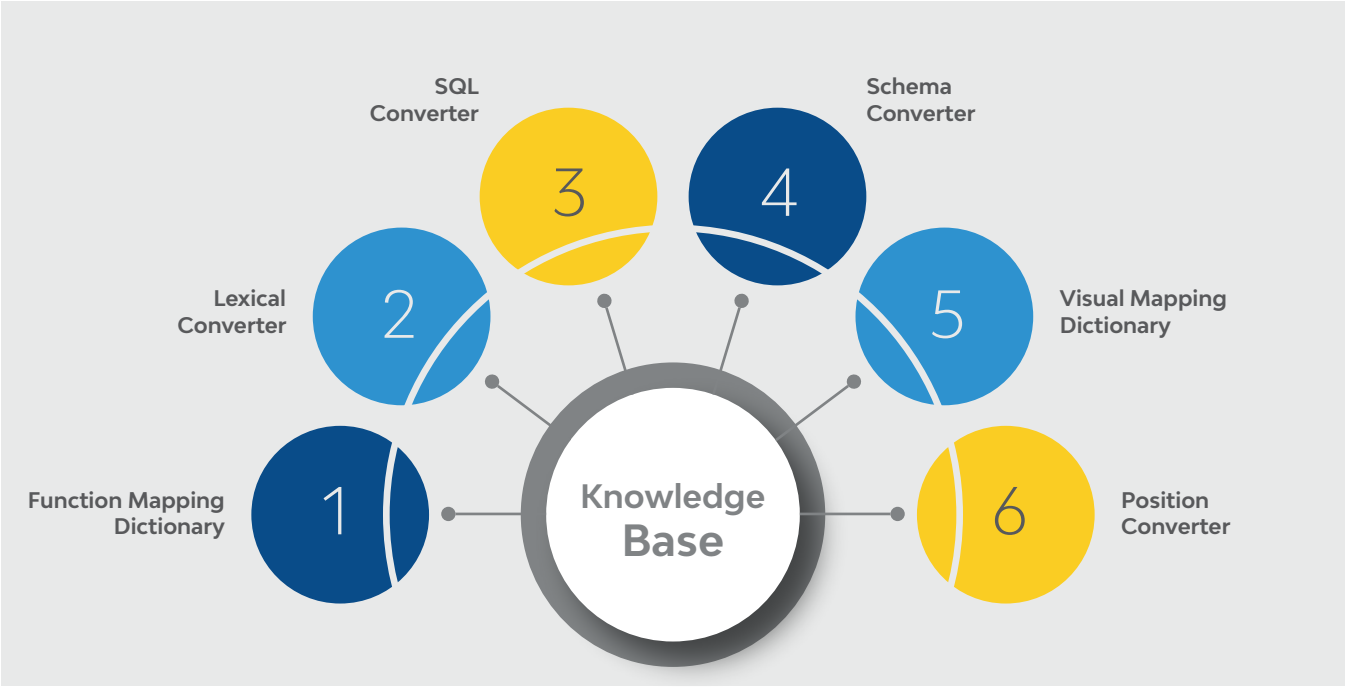
Usage & Audit data for rationalization

Usage statistics of the report indicate the popularity and rationale for migration.

LTIMindtree Recast Strategizer:

Prepare knowledge base for migration

Once all the data is extracted from the source BI system, the next focus is migration to the target BI. Every BI tool has different architecture; hence, it requires a different strategy for migration. In spite of having different migration approaches, the knowledge base build method is common across the board.



A functional knowledge base is a repository of information on Source and Target BI tools.

Function Mapping Dictionary: String, Math, logical, Aggregation mapping

Lexical Converter: Language conversion like IF ELSE THEN flow

SQL Converter: Extract SQL elements Table, Column, etc. or Tool Specific SQL

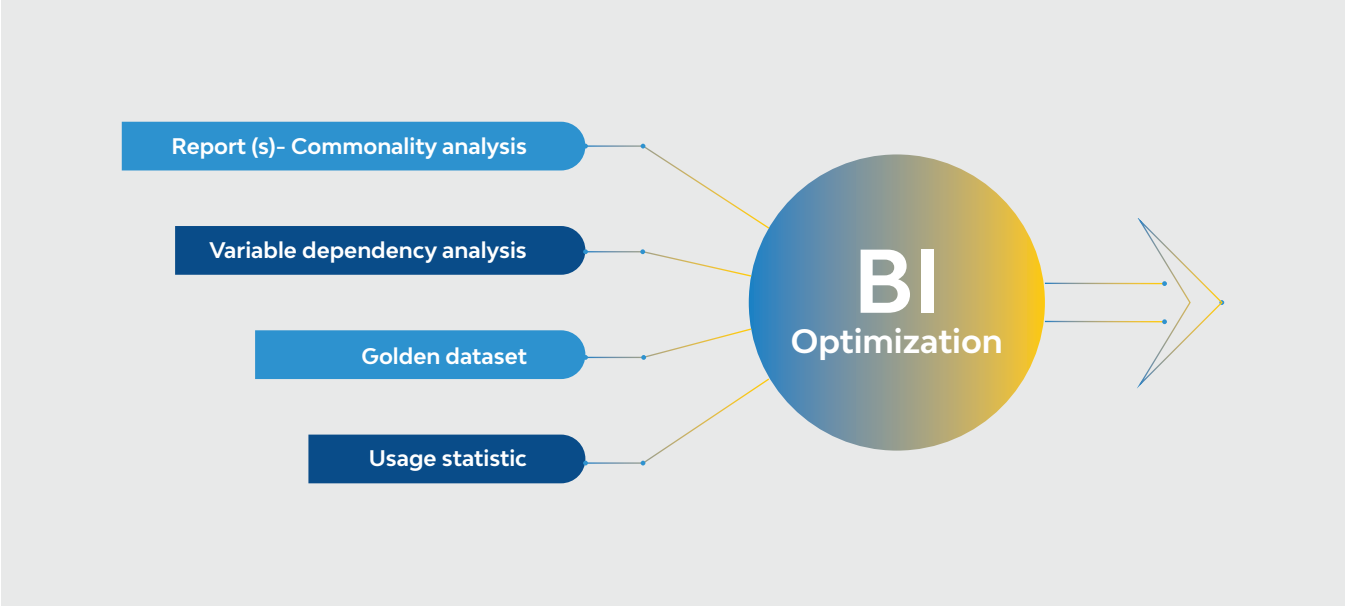
Schema Converter: Scenario for DB migration

Visual Mapping Dictionary: Source target Visual mapping

Position Converter: Conversion of X, Y, width, and height

Once the knowledge base is ready, it can be used to build migration scripts that are aligned to the target BI tool.

Recast Strategizer also provides 360 degree view of report lineage. It is useful to identify and remove duplicate reports, merge similar reports, build efficient data model, and perform post-migration performance improvements.



LTIMindtree Recast Migrator:

Automates migration to Target BI

LTIMindtree Recast Migrator can be used to automate the development of report using the knowledge base created by Recast Strategizer. Various BI tools allow API, SDK, XML, or JSON support to create new reports. For few BI tools, RPA (Robotic Process Automation) technologies are leveraged to emulate manual process.

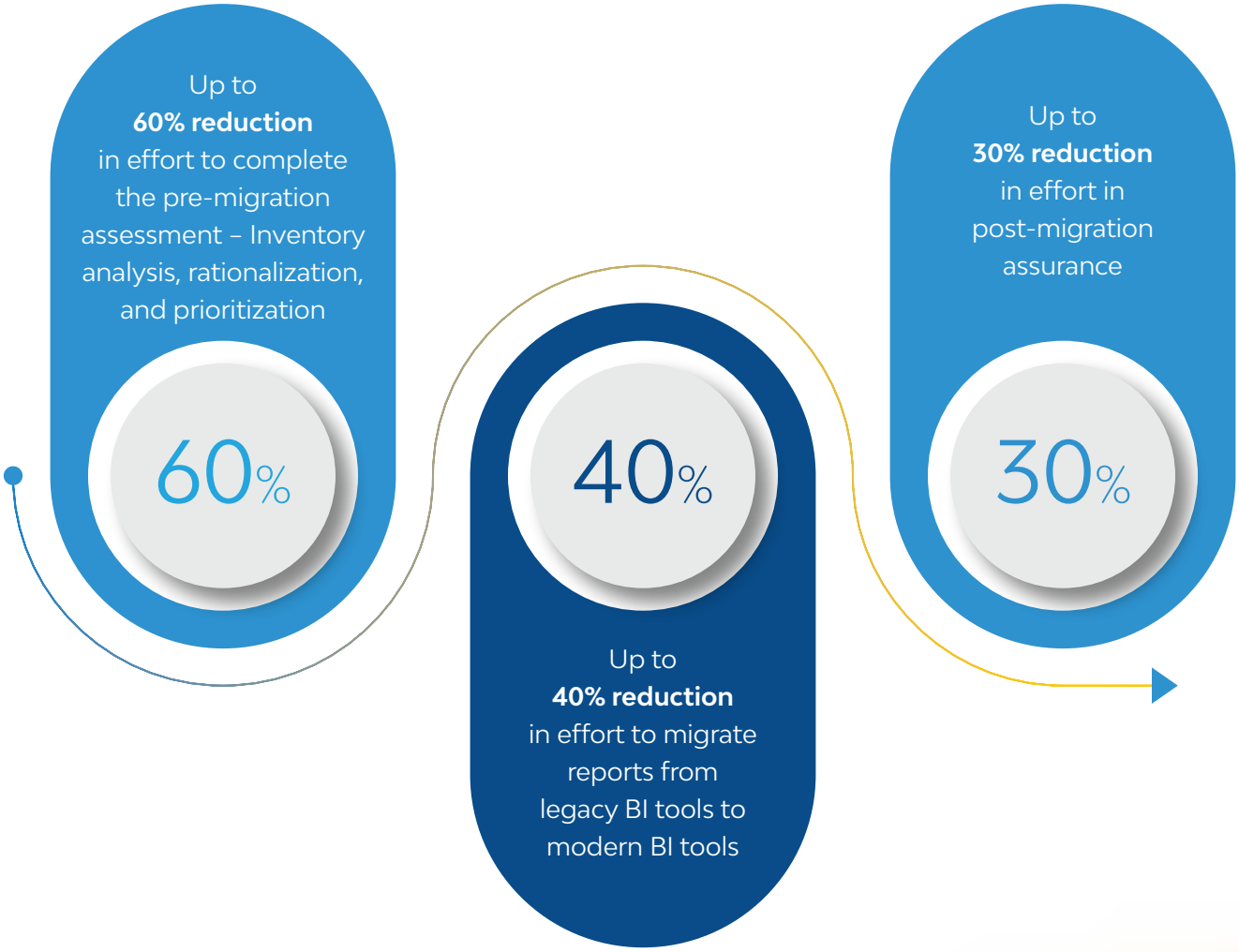
LTIMindtree Recast Reviewer:

Validation of BI Migration

This review and validation framework measures the success of automation. The discrepancy, limitation, and exception post the migration will be gauged and corrective measures will be prescribed. A report-wise analysis will help determine the success of the automated migration.

Benefits of LTIMindtree Recast

LTIMindtree clients who have used LTIMindtree Recast in their BI Migration initiative have realized the following benefits:



In addition to the reduction in effort and cost, LTIMindtree Recast has helped our clients accelerate the migration timeline and faster onboarding of the users onto the new BI platform.

Conclusion

LTIMindtree has leveraged time-tested Artificial Intelligence and RPA technologies to build LTIMindtree Recast. Our clients were able to left-lift risk associated with BI migration projects by using Recast. They have also benefited by accelerating BI Migration compared to the manual approach.

Reference

Global BI Vendor Market

https://www.mordorintelligence.com/industry-reports/global-business-intelligence-bi-vendors-market-industry#:~:text=The%20Business%20Intelligence%20(BI)%20Market%20was%20valued%20at%20USD%2020.516,period%20(2021%2D2026).

About the Author

Animesh
Palit

Product Architect

LTIMindtree Recast

Animesh Palit is the Product Architect for Canvas Recast. Animesh has over 20 years of experience in architecting and building process automation and artificial intelligence solution across various industry domains.

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