



Data warehouse & Business
Intelligence

Motor Claim Register



Objective

- สร้างฐานข้อมูล Data Warehouse สำหรับใช้งานภายในองค์กร
- นำเข้าข้อมูลจาก Source ต่างๆเข้าสู่ Data Warehouse
- ทำการสร้าง Analytical Query (Cube) สำหรับนำไปใช้งาน
- สร้างรายงานในรูปแบบ Visualization เพื่อนำเสนอให้กับ Chief Executive Officer



Business Requirement

- รายงานการเกิดอุบัติเหตุ ของการรับประกันกรมธรรม์ของบริษัท
- เพื่อแสดงข้อมูล Severity และ Frequency ของแต่ละเงื่อนไข เช่น
 - แสดงแยกตามประเภทรถยนต์
 - แสดงแยกตามประเภทกรมธรรม์(Product)
 - ปริมาณการเกิดอุบัติเหตุในแต่ละปี , เดือน , วัน
 - แสดงพื้นที่ที่เกิดอุบัติเหตุจากข้อมูลการเคลมของบริษัท
- เพื่อใช้ประกอบการตัดสินใจและกำหนดนโยบายสำหรับการออกผลิตภัณฑ์ใหม่ และการพิจารณาการรับประกันงานแต่ละกลุ่มของตัวแทน

Process

DB

- สร้าง Database สำหรับทำ Data Warehouse

ETL

- นำข้อมูลจาก Source ภายนอกเข้าสู่ Data Warehouse
- Dimension Table & Fact Table

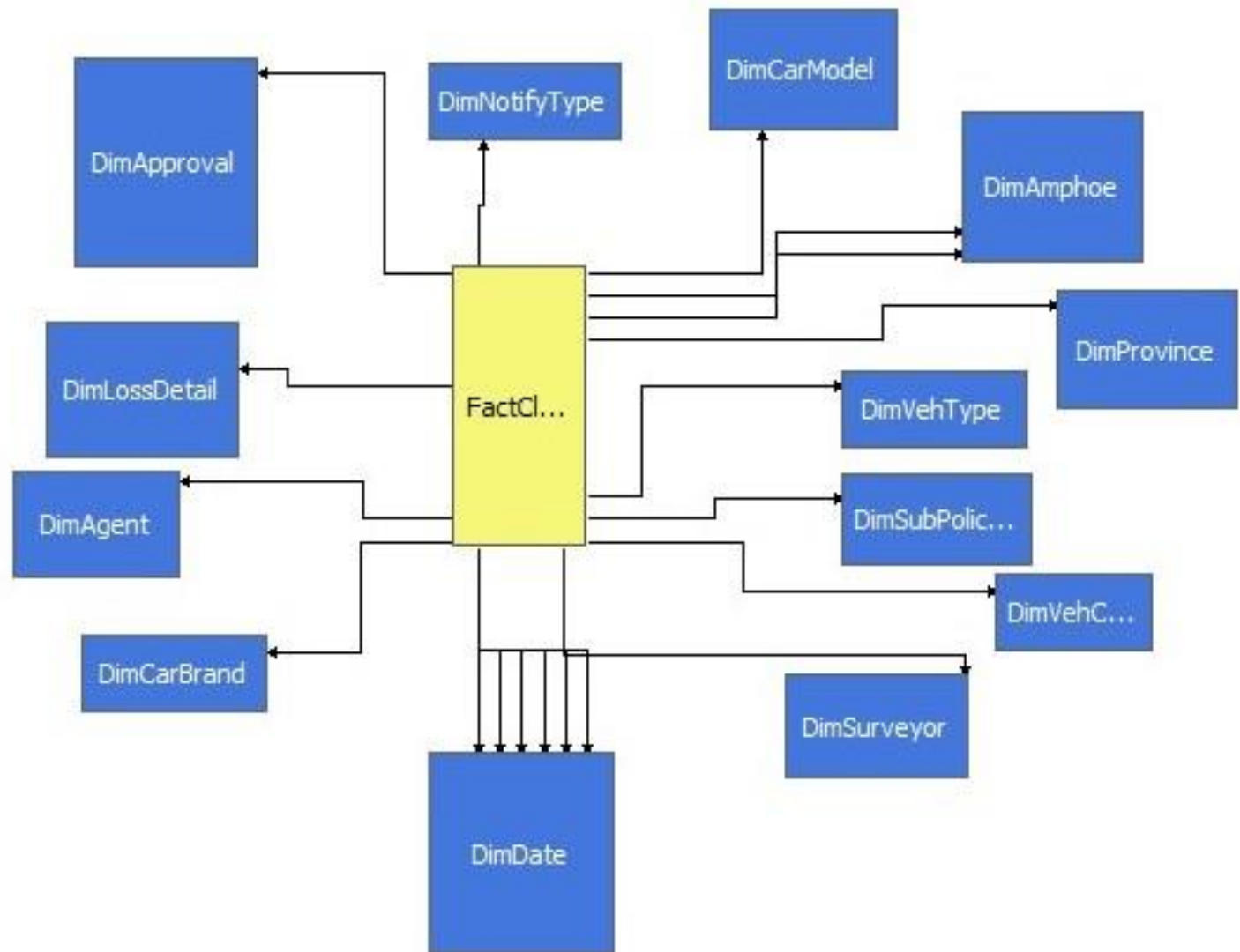
Cube

- สร้าง Analytical Query (Cube)

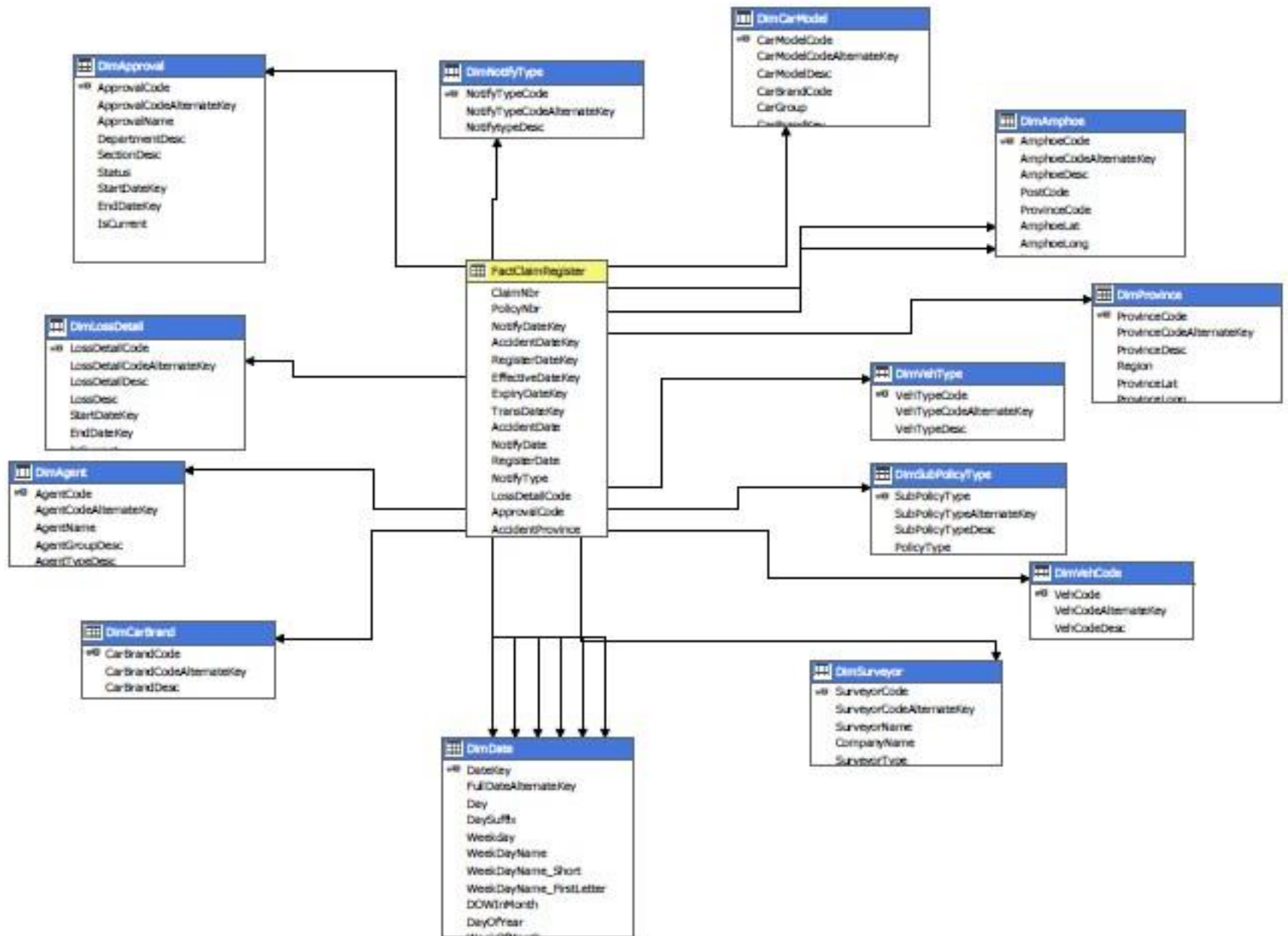
Visual

- สร้าง visualization สำหรับการนำเสนอให้กับผู้บริหาร

Data Warehouse Diagram



Data Warehouse Diagram



Data Source(.csv)

This PC > LENOVO_USB_HDD (E:) > Project DW > Data Source > DataSource

Name	Date modified	Type
Backup_test	10/03/2021 15:35	File folder
Data_Test	10/03/2021 15:27	File folder
AGENT.csv	23/02/2021 23:32	Microsoft Excel Comma Separated Values File
AMPHOE.csv	18/02/2021 22:24	Microsoft Excel Comma Separated Values File
CHANGWAT.csv	18/02/2021 22:26	Microsoft Excel Comma Separated Values File
DataClaim.csv	02/03/2021 2:10	Microsoft Excel Comma Separated Values File
LOSSDET.csv	24/02/2021 0:11	Microsoft Excel Comma Separated Values File
NOTIFYTYPE.csv	18/02/2021 22:52	Microsoft Excel Comma Separated Values File
PLANCTRL.csv	18/02/2021 23:23	Microsoft Excel Comma Separated Values File
STAFF.csv	24/02/2021 0:16	Microsoft Excel Comma Separated Values File
Surveyor.csv	21/02/2021 20:04	Microsoft Excel Comma Separated Values File
VEHCODE.csv	18/02/2021 23:16	Microsoft Excel Comma Separated Values File
VEHDET.csv	24/02/2021 0:05	Microsoft Excel Comma Separated Values File
VEHICLE.csv	18/02/2021 22:58	Microsoft Excel Comma Separated Values File
VEHTYPE.csv	18/02/2021 22:58	Microsoft Excel Comma Separated Values File

ทำ ETL จาก Data Source

LoadDimCarModel.dtsx [Design] | LoadDimAmphoe.dtsx [Design] | LoadDimLossDetail.dtsx [Design]

Control Flow | Data Flow | Parameters | Event Handlers | Package Explorer

Data Flow Task: Data Flow Task

60%

Connection Managers

- Flat File Connection Manager
- Flat File Connection Manager 1
- (project) ClaimRegisterDW

Output

Solution Explorer

Search Solution Explorer (Ctrl+J)

Solution 'ClaimRegisterDW' (1 of 1 project)

- ClaimRegisterDW
 - Project.params
 - Connection Managers
 - ClaimRegisterDW.conmgr
 - SSIS Packages
 - LoadDimAgent.dtsx
 - LoadDimAmphoe.dtsx
 - LoadDimApproval.dtsx
 - LoadDimCarModel.dtsx
 - LoadDimDate.dtsx
 - LoadDimLossDetail.dtsx
 - LoadDimNotifyType.dtsx
 - LoadDimSubPolicyType.dtsx
 - LoadDimSurveyor.dtsx
 - LoadDimVehCode.dtsx
 - LoadDimVehType.dtsx
 - LoadFactClaimRegister.dtsx
 - Master.dtsx

Solution Explorer | Git Changes

Properties

Data Flow Task Task

Forced Execution Value

ForcedExecutionValue	0
ForcedExecutionValueType	Int32
ForceExecutionValue	False



Load Dimension Table

- LoadDimDate
- LoadDimAgent
- LoadDimAmphoe
- LoadDimApproval
- LoadDimCarModel
- LoadDimLossDetail
- LoadDimSubPolicyType
- LoadDimSurveyor
- LoadDimVehCode
- LoadDimVehType
- LoadDimNotifytype

Load Fact Table

- LoadFactRegisterClaim

SCD Type 0 & 1

The screenshot displays the SQL Server Data Tools (SSDT) interface. The main window shows a Data Flow Task named 'Load DimAmphoe' with a flowchart containing tasks: 'Load Production_DimAmphoe', 'Lookup ProvinceCode', 'Lookup Match Output', 'Replace ProvinceCode', 'Slowly Changing Dimension', 'New Output', 'Changing Attribute Updates Output', 'Insert Destination', and 'OLE DB Command'. The 'Slowly Changing Dimension' task is highlighted.

The 'Slowly Changing Dimension Wizard' dialog box is open, showing the 'Slowly Changing Dimension Columns' step. The wizard instructs the user to 'Manage the changes to column data in your slowly changing dimensions by setting the change type for dimension columns.'

The wizard provides three options for selecting a change type for slowly changing dimension columns:

- Fixed Attribute:** Select this type when the value in a column should not change. Changes are treated as errors.
- Changing Attribute:** Select this type when changed values should overwrite existing values. This is a Type 1 change.
- Historical Attribute:** Select this type when changes in column values are saved in new records. Previous values are saved in records marked as outdated. This is a Type 2 change.

The 'Select a change type for slowly changing dimension columns:' table is shown below:

Dimension Columns	Change Type
AmphoeDesc	Changing attribute
AmphoeLat	Changing attribute
AmphoeLong	Changing attribute
PostCode	Changing attribute
ProvinceKey	Fixed attribute

The 'ProvinceKey' column is highlighted in the table. The 'Remove' button is visible at the bottom right of the table.

The 'Connection Managers' pane at the bottom left shows 'Flat File Connection Manager' and 'Flat File Connection Manager 1'. The 'Error List' pane is empty.

The 'Solution Explorer' pane on the right shows the project structure, including 'Connection Managers', 'ClaimRegisterDW.com', and 'SSIS Packages'. The 'Properties' pane at the bottom right shows the 'Slowly Changing Dimension Data Flow' task properties, including 'IdentificationStri', 'IsDefaultLocale', 'LocaleID', and 'Name'.

SCD Type 1 & 2

LoadDimApproval.dtsx [Design] | LoadFactClaimRegister.dtsx [Design]

Control Flow | Data Flow | Parameters | Event Handlers | Package Explorer

Data Flow Task: Data Flow Task

Update Existing Version | SCD Type 1 Change | Conditional Split | SCD Type 2 Change | Expire Existing Version

New Record

Union All

Add EndDataKey

OLE DB Destination

Connection Managers

Flat File Connection Manager | (project) ClaimRegisterDW

Error List

Entire Solution | 0 Errors | 2 Warnings | 0 Messages

Description

Warning loading ClaimRegisterDW.dproj: Warning: Failed to decrypt sensitive data user who encrypted this project, or you are not using the same machine that was u parameter value, the value may be required to run the package on the Integration S

Conditional Split Transformation Editor

Specify the conditions used to direct input rows to specific outputs. If an input row matches no condition, the row is directed to a default output.

Variables and Parameters

Columns

Mathematical Functions

String Functions

Date/Time Functions

NULL Functions

Type Casts

Operators

Description:

Order	Output Name	Condition
1	New Record	ISNULL(DW_ApprovalCode)
2	SCD Type 1 Change	(ApprovalName != DW_ApprovalName)
3	SCD Type 2 Change	(Status != DW_Status)

Default output name: No Change

Configure Error Output... | OK | Cancel | Help

Explorer

Solution Explorer (Ctrl+;) | ClaimRegisterDW (1 of 1)

ClaimRegisterDW

Project.params

Connection Managers

ClaimRegisterDW.con

SSIS Packages

LoadDimAgent.dtsx

LoadDimAmphoe.dtsx

LoadDimApproval.dtsx

LoadDimCarModel.dtsx

LoadDimDate.dtsx

LoadDimLossDetail.dtsx

LoadDimNotifyType.dtsx

LoadDimSubPolicyType.dtsx

Git Changes

Conditional Split Data Flow Component Properties

DefaultLocale: True

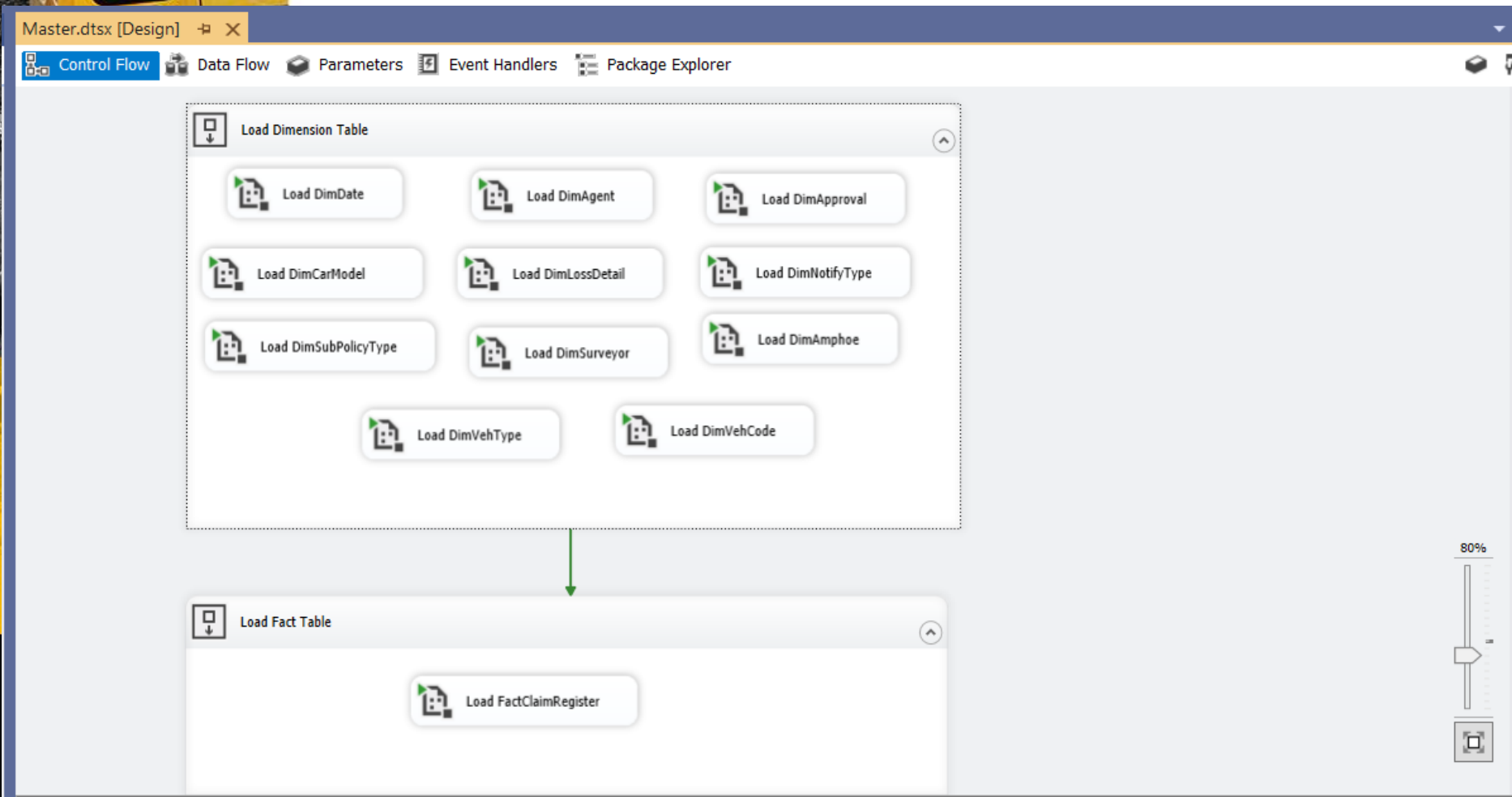
Language: English (United States)

Version: 0

Show Advanced Editor

is the name of the component.

Master Package



Deploy

The screenshot displays the Microsoft SQL Server Enterprise Manager interface. The left pane shows the 'Object Explorer' with a tree view of the server hierarchy. The right pane shows the 'Package Properties' dialog box for the 'Master.dtsx' package.

Object Explorer Tree View:

- LAPTOP-VUSLIKIE (SQL Server 15.0.2080.9 - LAPTOP-VUSLIKIE\phuri)
 - Databases
 - System Databases
 - Database Snapshots
 - AdventureWorks2019
 - AdventureWorksDW2019
 - ClaimRegisterDW
 - SSISDB
 - Security
 - Server Objects
 - Replication
 - PolyBase
 - Always On High Availability
 - Management
 - Integration Services Catalogs
 - SSISDB
 - ClaimRegisterProject
 - Lab
 - Projects
 - PopulateDW
 - Packages
 - LoadDimDate.dtsx
 - LoadDimProduct.dtsx
 - LoadFactProductInventory.dtsx
 - Master.dtsx
 - Environments
 - SQL Server Agent
 - XEvent Profiler

Package Properties Dialog Box:

Ready

Select a page

- General

Connection

LAPTOP-VUSLIKIE [LAPTOP-VUSLIKIE\phuri]

[View connection properties](#)

Progress

Ready

General

Name	Master.dtsx
Identifier	3
Entry Point	True
Description	

Name
The name of the package.

OK Cancel Help



Create Analytical Query(Cube)

- Create Data Source
- Create Data Source View
- Create Cube
- Visualization from Cube

Data Source View

ClaimRegisterTable.dsv [Design] | ClaimRegisterCube.cube [Design]

Diagram Organizer: <All Tables>

Tables:

- DimAgent
- DimAmphoe
- DimApproval
- DimCarBrand
- DimCarModel
- DimDate
- DimLossDetail
- DimNotifyType
- DimProvince
- DimSubPolicyType
- DimSurveyor
- DimVehCode
- DimVehType
- FactClaimRegister

Diagram showing FactClaimRegister table connected to various dimension tables (DimApproval, DimAmphoe, DimProvince, DimVehType, DimSubPolicyType, DimVehCode, DimAgent, DimLossDetail, DimNotifyType).

Properties for ClaimRegisterTable DataSourceView:

- RetrieveRelation: True
- SchemaRestrict: True
- Data Source: ClaimRegisterDW
- Description: ClaimRegisterTab
- Name: ClaimRegisterTab
- NameMatching: Same name as...
- Name: Specifies the name of the object.

Error List: Entire Solution | 0 Errors | 0 Warnings | 0 Messages | Build + IntelliSense

Description	Project	File	Line
-------------	---------	------	------

Create Cube

ClaimRegisterTable.dsv [Design] ClaimRegisterCube.cube [Design]

Cube Structure Dimension Usage Calculations KPIs Actions Partitions Aggregations Perspectives Translations Browser

Measures

- ClaimRegisterCube
- Fact Claim Register
 - Driver Age
 - OD Estimate
 - TPD Estimate
 - TPBI Estimate

Dimensions

- ClaimRegisterCube
 - Dim Approval
 - Accident Amphoe
 - Dim Surveyor
 - Dim Amphoe
 - Dim Veh Type
 - Dim Sub Policy Type
 - Dim Car Brand
 - Dim Car Model
 - Dim Agent
 - Dim Veh Code
 - Notify Date
 - Register Date
 - Trans Date

Data Source View

FactClaimRegister

- ClaimNbr
- PolicyNbr
- NotifyDateKey
- AccidentDateKey
- RegisterDateKey
- EffectiveDateKey
- ExpiryDateKey
- TransDateKey
- AccidentDate
- NotifyDate
- RegisterDate
- NotifyType
- LossDetailCode
- ApprovalCode

DimApproval

- ApprovalCode
- ApprovalCodeAlternateKey
- ApprovalName
- DepartmentDesc
- SectionDesc
- Status
- StartDateKey
- EndDateKey
- IsCurrent

DimNotifyType

- NotifyTypeCode
- NotifyTypeCodeAlternateKey
- NotifyTypeDesc

DimAmphoe

- AmphoeCode
- AmphoeCodeAlternateKey
- AmphoeDesc
- PostCode
- ProvinceCode
- AmphoeLat
- AmphoeLong

DimProvince

- ProvinceCode
- ProvinceCodeAlternateKey
- ProvinceDesc
- Region
- ProvinceLat
- ProvinceLong

DimLossDetail

- LossDetailCode
- LossDetailCodeAlternateKey
- LossDetailDesc
- LossDesc
- StartDateKey
- EndDateKey
- IsCurrent

DimVehType

- VehTypeCode
- VehTypeCodeAlternateKey
- VehTypeDesc

DimAgent

- AgentCode

DimSubPolicyType

- SubPolicyType
- SubPolicyTypeAlternateKey

Error List

Entire Solution 0 Errors 0 Warnings 0 Messages Build + IntelliSense Search Error List

Description	Project	File	Line
-------------	---------	------	------

Ready

Solution Explorer

Solution 'ClaimRegisterCube' (1)

- ClaimRegisterCube
 - Data Sources
 - ClaimRegisterDW.ds
 - Data Source Views
 - ClaimRegisterTable.ds
 - Cubes
 - ClaimRegisterCube.cu
 - Dimensions
 - Dim Approval.dim
 - Dim Notify Type.dim
 - Dim Province.dim
 - Dim Amphoe.dim
 - Dim Surveyor.dim

Properties

ClaimRegisterCube Cube

Source	ClaimRegisterTab
Visible	True

Basic

Description	
ID	ClaimRegisterCub
Name	ClaimRegisterCul

Configurable

Name

Specifies the name of the object.

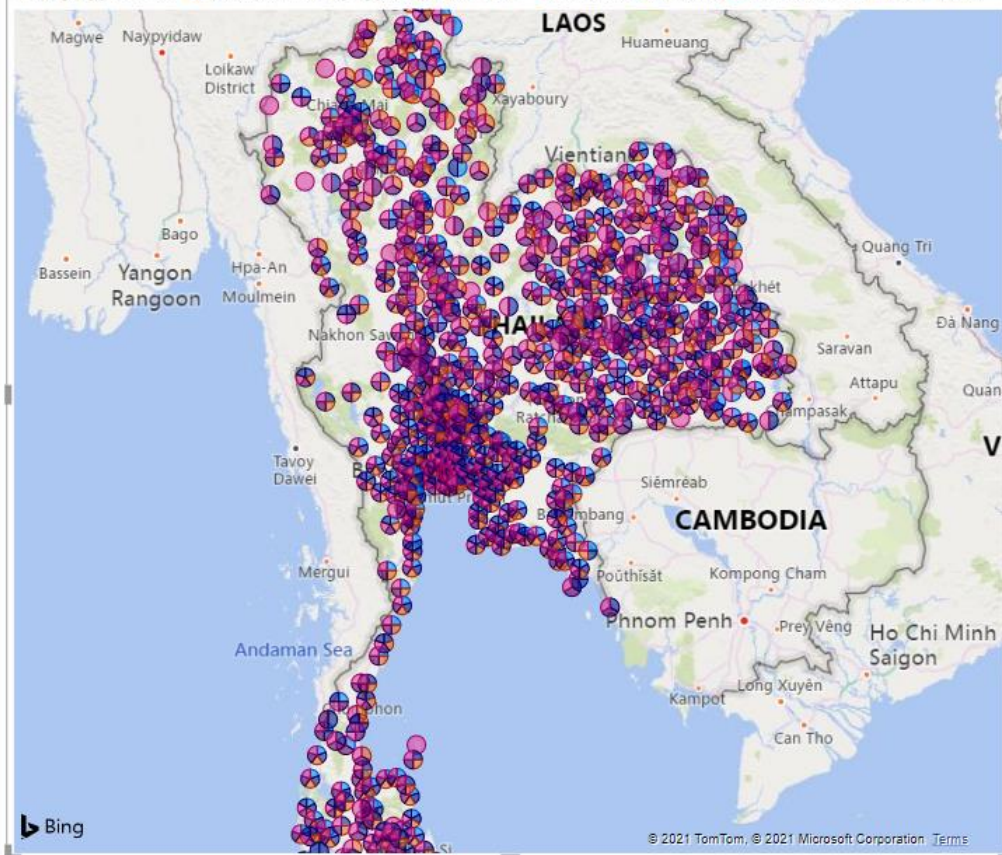
Add to Source Control

Visualization by PowerBI

รายงานตามที่เกิดเหตุ และ ประเภทรับแจ้ง

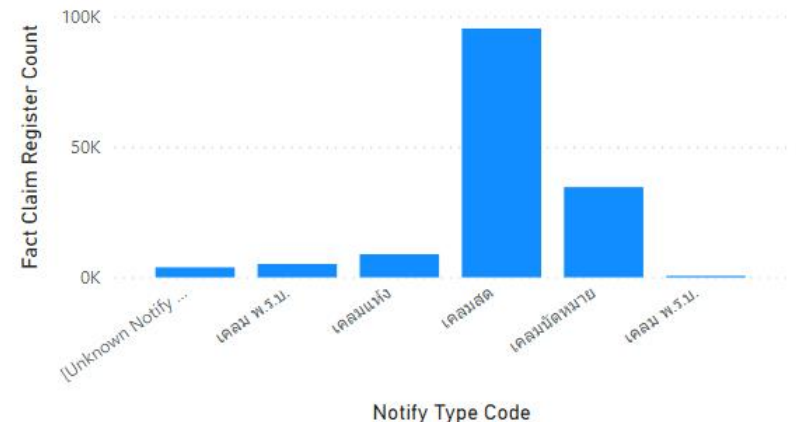
Notify Type Code, Amphoe Lat and Amphoe Long

Notify Type Code [Unknown Notify Type] ● เคม พ.ร.บ. ● เคมแพ่ง ● เคมสด ● เคมนัดหมาย ● เคม พ.ร.บ.



Calendar Year	Calendar Month	Fact Claim Register Count
2020	April 2020	3203
2020	August 2020	4607
2020	December 2020	4791
2020	February 2020	5413
2020	January 2020	5918
2020	July 2020	4396
2020	June 2020	4105
2020	March 2020	4870
2020	May 2020	4080
2020	November 2020	4799
2020	October 2020	5020
2020	September 2020	4558
2021	January 2021	3309
Total		148300

Fact Claim Register Count by Notify Type Code

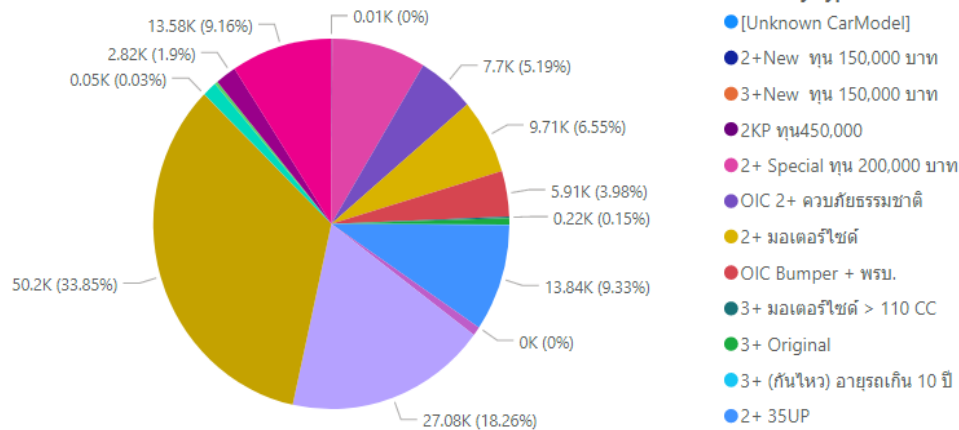


Visualization by PowerBI

รายงานแยกตามผลิตภัณฑ์ และ ประเภทรถยนต์

Veh Code	OD Sum Ins	OD Estimate	TPD Sum Ins	TPD Estimate	REC Estimate	Premium
[Unknown VehCode]	17,750,000.00	495,200.00	108,100,000.00	75,000.00	38,000.00	509,564.11
หางพวง	0.00	0.00	0.00	0.00	0.00	1,696.44
บรรทุกรับจ้าง	0.00	0.00	0.00	0.00	0.00	257,409.40
แก๊ง2ตอน	16,791,644,050.00	491,685,255.00	106,679,350,000.00	133,465,290.80	170,596,303.00	572,819,011.33
คู่รับจ้าง	12,770,000.00	802,595.00	357,200,000.00	2,369,380.00	326,000.00	4,959,852.36
หางพวง	0.00	0.00	18,000,000.00	430,091.00	0.00	236,267.40
บรรทุก	0.00	0.00	0.00	0.00	0.00	28,755.50
รถยนต์ประเภทอื่นๆ	0.00	0.00	0.00	0.00	0.00	14,906.36
คู่รับจ้าง	308,080,000.00	17,398,283.00	2,018,900,000.00	7,340,257.00	8,157,850.00	21,158,481.08
รถสามล้อเครื่อง/ใช้เพื่อการรับจ้าง, ให้เช่า	0.00	0.00	2,330,000,000.00	15,894,833.00	30,000.00	14,797,582.50
กะบะบรรทุก	9,135,729,500.00	269,399,006.00	67,131,700,000.00	110,008,453.00	67,951,510.00	356,683,123.16
Total	27,095,612,550.00	825,291,070.00	196,160,050,000.00	356,284,780.20	261,696,014.00	1,148,116,278.52

Fact Claim Register Count by Sub Policy Type

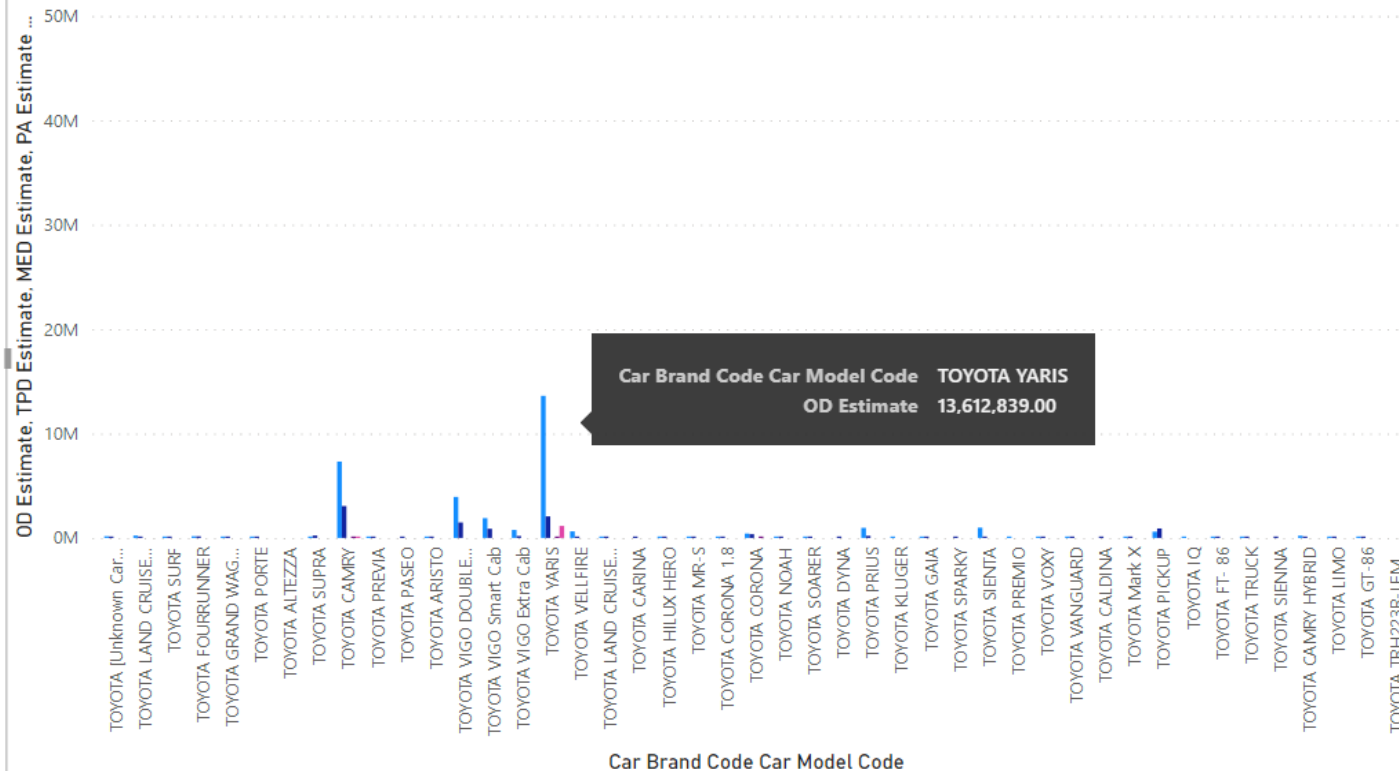


Visualization by PowerBI

รายงานแยกตามยี่ห้อ/รุ่นรถยนต์ และ ปีที่เกิดเหตุ

OD Estimate, TPD Estimate, MED Estimate, PA Estimate and TPBI Estimate by Car Brand Code and Car Model Code

● OD Estimate ● TPD Estimate ● MED Estimate ● PA Estimate ● TPBI Estimate



Car Brand Code

- Select all
- [Unknown CarBrand]
- Unknown
- SUZUKI
- HYUNDAI
- KIA
- VOLKSWAGEN
- SSANGYONG

Calendar Year

- Select all
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017
- 2018
- 2019
- 2020
- 2021
- 2022
- 2023
- 2024



THE END