Supplier Recovery Claim Automation

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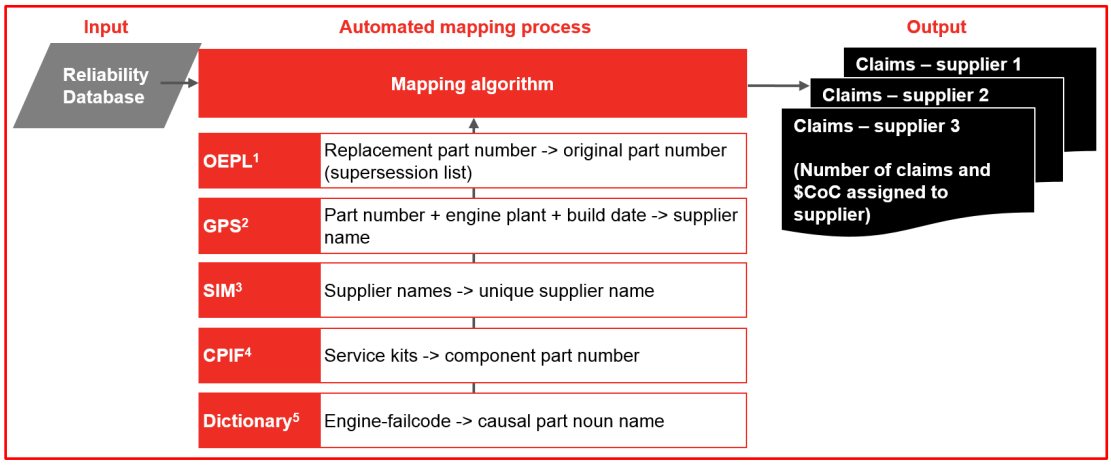
Introduction

In order to tie warranty claim data to key suppliers, we need to manipulate and translate data from multiple systems or databases to link the information together. Each of these systems has a unique way of describing the failures and the parts associated with the failures, and the warranty claim information may indicate multiple types of failures and multiple parts replaced. We use JMP to identify the causal part replaced for each warranty claim based on historical information. We then use that part number, along with information about the product and where and when it was built, to map the claim to the responsible supplier. Query Builder is utilized to retrieve the data from multiple systems. We use Text Explorer to create a recoded supplier name from the text-entry systems, with notifications to the user to review if new relationships are found. The results are then visualized in Graph Builder to present to internal customers as well as suppliers. The entire process is scripted in a JMP add-in with a user interface to allow data queries for specific products or time frames.

Process of Mapping Claim to Supplier

Accurately and reliably directing incoming claims to suppliers is critical for successfully negotiating sharing agreements with suppliers. The process of mapping claims to suppliers begins with warranty claims data and the associated part numbers. The report algorithm then utilizes information from four other databases and a Dictionary of historical and expert knowledge to tie claims to suppliers according to the algorithm logic. At the end of the process, we arrive at the claims associated with key suppliers, along with a visual representation of the claims and Cost of Coverage (CoC) for each supplier.



1 Original Equipment Parts List (OEPL) 2 Global Purchasing System (GPS) 3 Supplier Information Management (SIM) 4 Central Product Information File (CPIF)
5 Dictionary: Engine-failcode to most likely 'causal' part noun name data table developed using CMI expert inputs

Figure 1 – Process Map

Challenges of mapping Claim to Supplier

There are four main challenges in accurately mapping claims to suppliers with the existing tools and resources. First, the ideal data are not present in the claims: primarily, the supplier of the causal part.

Second, the data sets needing to be processed are high volume – more than 500,000 records, thousands of part numbers and suppliers, and hundreds of product types. This makes the current, manual process difficult and time-consuming. Third, the five distinct databases are not easily linked, and the common data fields may not be identified or documented. Finally, there is an absence of standard nomenclature between part names and failure descriptions.

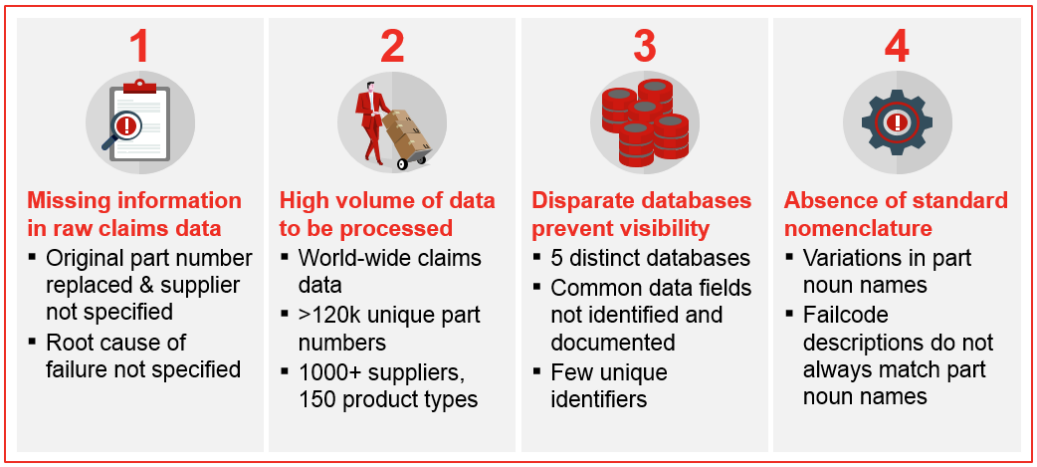


Figure 2 - Challenges of Current Process

These challenges make the process of mapping claim to supplier difficult, but JMP lightens the load through the following dynamic capabilities.

Claim Mapping in JMP

Automating the claim mapping process in JMP allows us to create an accurate, robust, and scalable process. JMP's features for working with data, including Query Builder, Text Explorer, and Graph Builder, help make the report more efficient. The scripting and display capabilities, like Display Trees, Interactive Display Elements, and Add-Ins, enable a standardized tool that delivers exactly what the users need.

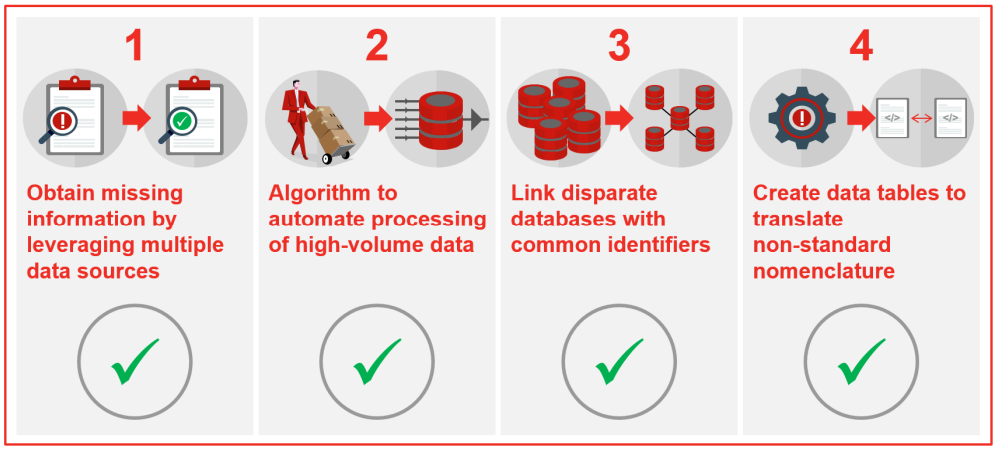


Figure 3 - Benefits of Automating in JMP

Query Builder

JMP's Query Builder allows us to create and run customized queries against the various systems. We use Query Builder to pull data from the databases, and also to execute queries on data tables. This is especially useful when joining on date ranges. For example, the script shown here looks for suppliers of a part number during the *time periods* the part numbers would have been in use.

```
causal_records_firstmatch = New SQL Query(
  Connection( "JMP" ),
  QueryName( "causal_records_firstmatch" ),
  CUSTOM SQL(
    "SELECT *
    FROM causal_nonkit_claims t1
    LEFT OUTER JOIN GPS_ALL_GOLDENSUMMARY t2
       ON  (  ( t1.REPL_PART_7 = t2.GPS_PARTNUM_7 )
         AND  ( t1.PLANT_CODE = t2.SOURCE_CODE_PLANT )
         AND  ( t1.FAIL_BUILD_DATE >= t2.EFFECTIVE_DATE )
         AND  ( t1.FAIL_BUILD_DATE <= t2.NEW_EXPIRATION_DATE )
       )"
  )
) << Run;
```

Text Explorer

Using Text Explorer, we analyze the supplier names that get mapped to claims. Variations in the names may occur because of free text entry fields in the system, for example "Ace Components" and "Ace Components LLC". Text Explorer counts groupings of similar supplier names, so we are able to see if the supplier names need to be updated. This helps us identify additional name recoding opportunities, and also shows us suppliers with recovery opportunity that may not be on the current list of key suppliers.

Notifications to Users

We created notifications to alert our users when it's time to update the Dictionary of historical information, the list of supplier names, and other lookup tables. The script also notifies the user if any of the listed suppliers returned no data, or if there are additional suppliers with claims based on the results of the text analysis. The notifications provide instant feedback to the user about how the script performed, and they help maintain the accuracy of the report.

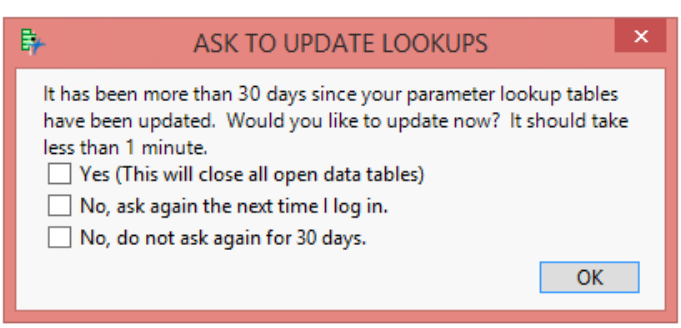


Figure 4 - Example of notification to update lookup tables

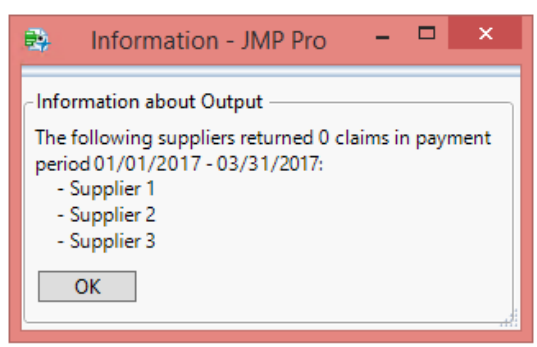


Figure 5 - Example of notification about script's results

Graph Builder

Part of the output of this report includes graphs for visualizing the suppliers' claims over the recent years. We use Graph Builder in this script to create the custom graphs. The script then saves the graphs in PowerPoint slides to easily share with suppliers and other users of the data.

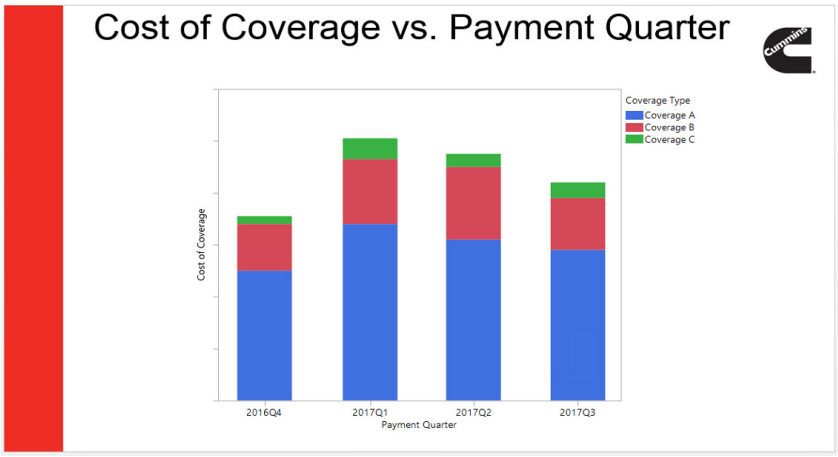


Figure 6 - Graph Builder saved as presentation

Add-In

JMP Add-Ins allow us to efficiently distribute and maintain this report for our users. The add-in package contains all the dependent files – other scripts, lookup tables – which makes it easy for our users to run the script.

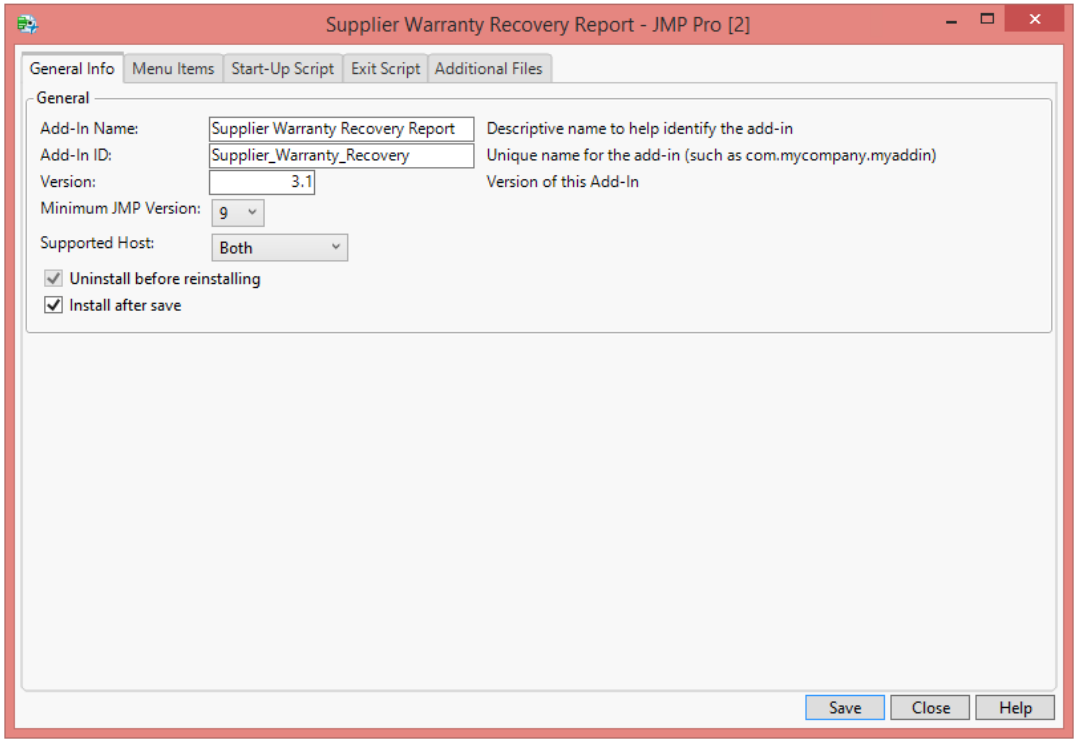


Figure 7 - Add-In

As new updates are released, a script in the add-in checks the depot for new versions.

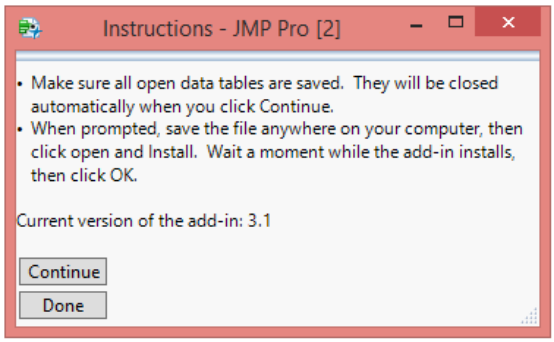


Figure 8 - Check for Updates

User Interface

The Add-In launches an interface where our users can specify products or time frames for the report's data queries. This allows users to pull exactly the information they need, and JMP's display elements provide a good platform for interaction between users and the script. Also in the interface, the user can specify where the output files get saved.

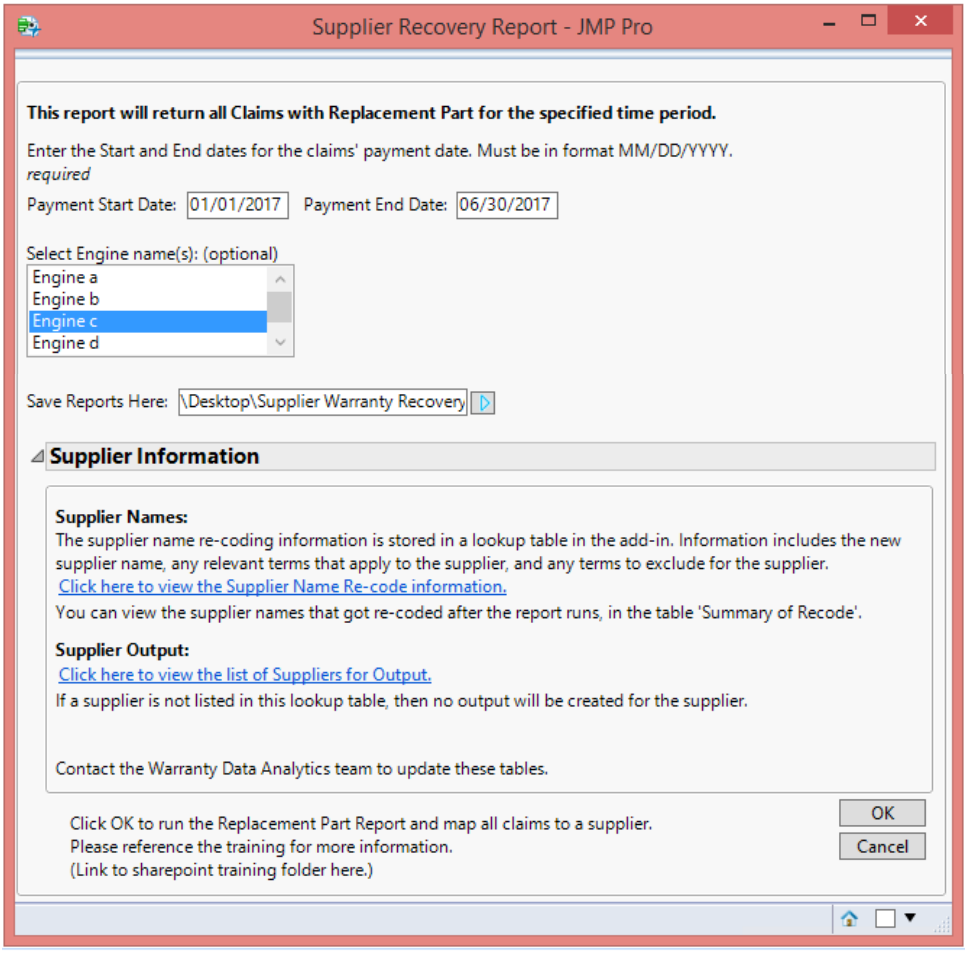


Figure 9 - User Interface

Conclusion

The process of mapping claim to supplier was difficult and complex with the previously existing tools and resources. By leveraging the capabilities JMP provides, we were able to create a standardized, user-friendly, robust tool for our users. JMP's capabilities for working with data such as Query Builder, Text Explorer, and Graph Builder, saved countless hours of manual processing, helped us to standardize warranty sharing agreements for key suppliers, and improved efficiency, scalability, and best-practices. JMP's tools for interacting with users, including Add-Ins and Interactive Display Elements, enabled us to deliver exactly what our users need with a custom interface and user input, and promoted continuous improvement through notifications to users and free-text analysis. By using JMP to automate the claim mapping process, we are better able to partner with suppliers and enable Cummins' brand of dependability.