



GeoData Modeler workflow for data model updates

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Laurel Hill GIS, Inc. 307 Bross Street Longmont CO, 80501



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Introduction

Data model changes are a standard part of any geodatabase implementation. How they are requested, tracked, implemented, tested and verified can vary widely for each organization. This document will detail the best practices for managing data model change with this process and GeoData Modeler.

Data Model Change Requests

Data Model Change requests can originate from several sources; user defect tickets, user enhancement requests and application development requirements for new functionality. The first step to managing change is to track the change requests. There are several web-based incident tracking tools available that can track the originator, the key decisions, the implementation strategy, test cases and test results.

Application development likely has a larger set of requirements involving interface, data flow interaction, and integrations to other systems. Developers and the business analysts work together to create a detailed design specification. The detailed design specification should include a section with data model change requirements.

Data Model Change Implementation

Data Model change implementation consists of review of the model change, implementation in all of the lower environments and finally into production.

Data Model Change Request Triage

Each data model request is reviewed for consistency compared to the current data model. For instance consistency of naming conventions, columns types, domain values. The intent is to use existing precedent for naming conventions and column types to create a consistent geodatabase. Existing names can easily be viewed using the power of filtering and sorting within the Excel spreadsheet. If a request is inconsistent with the data model, then the request is modified, if possible to best fit the current naming conventions.

Similarly, if a model request adds a significant number of duplicate columns that exist in other tables of feature classes, or adds annotation feature classes to a geodatabase that uses labeling exclusively, then the request will need to be modified to fit the current geodatabase precedence.

Data Model Spreadsheet Update

Each model change is entered into the data model spreadsheet. The information in the requirements tracking system should be enough to make the model change. A data model modification spreadsheet that mirrors the data model spreadsheet in tabs and columns is recommended to be attached to each requirement. Some requests may require multiple tabs to be modified, for instance if a column is to be added that has a domain and the domain has new values, then three tabs must be edited.



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Apply Data Model Updates to Development Environment

Data Model updates are applied to the development geodatabase with GeoData Modeler. To apply the model updates, open GeoData Modeler. Create a project for the development geodatabase.

The screenshot displays the GeoData Modeler application window. The main interface includes a menu bar (File, Help) and a toolbar with options like Report, Compare to Excel, Compare to Project, Upgrade using Excel, and Upgrade using Project. A central dialog box titled 'Updating From' is active, showing a project named 'Development' of type 'Oracle Database'. The input file is 'sheet\Data Model Spreadsheet.xlsx'. Below the dialog, a list of options under 'Standard' includes 'Update Geodatabase' (checked), 'Upgrade Geometric Network R...', 'Generate Python', 'Set Editor Tracking', 'Build Relationships', and 'Drop Relationships'. A 'Run' button with a checkmark is located at the bottom right of the dialog. At the bottom of the application, a messages pane shows the following text: 'Modifying field alias for field MIGRATIONID to Migration ID in table LAURELHILL.Wetlands', 'Setting subtype field to on Wetlands', 'Updating Annotation', '187 data model changes made', and 'Process Completed in 00:00:53.6944478'. The GeoData Modeler logo is visible in the bottom right corner of the application window.

In the example above 187 model changes we made to the development geodatabase.



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Unit Test Development Data Model Updates

Once the updates are applied, they must be tested. There are 2 methods for testing; confirm changes in ArcCatalog as a manual unit test, or run a comparison between the data model spreadsheet and the development geodatabase. Below is the comparison to the data model spreadsheet:

The screenshot shows the GeoData Modeler application window. The title bar reads "GeoData Modeler". The menu bar includes "File" and "Help". The toolbar contains several icons: "Report", "Compare to Excel", "Compare to Project", "Upgrade using Excel", and "Upgrade using Project".

The main workspace is divided into several sections:

- Left Panel:** A table with the following data:

Name	Development
Type	Oracle Database
Description	lhdemo1 laurelhill schema Connecting as laurelhill
- Center:** A blue arrow pointing right with the text "Comparing to".
- Right Panel:** A table with the following data:

Input File	C:\Users\mmccain\Documents\GeoC...
Type	Spreadsheet
Description	

Below the main workspace is a "Standard" section with a list of report options:

- Delta Spreadsheet: Reports the entire data model with highlighted deltas between the two inputs.
- HTML Report: Generate an HTML document that describes the database
- Domain Length Report: Compare domain value lengths with the lengths of fields that they are assigned to
- Orphaned Domains: Find domains that are unassigned
- HTML Report (Beta): Detailed HTML Report. Coming at version 1.1

A "Run" button with a checkmark icon is located at the bottom right of the main workspace.

At the bottom of the window is a "Messages" pane with the following text:

```
Comparing Schema
Generating output: Delta Spreadsheet
The Full Compare Spreadsheet can be found at C:\Users\mmccain\Documents\GeoData Modeler Projects\Development\database_compare_Development.xlsx
The Deltas Only Spreadsheet can be found at C:\Users\mmccain\Documents\GeoData Modeler Projects\Development\database_compare_deltas_Development.xlsx
Process Completed in 00:00:16.2891428
```

The GeoData Modeler logo is visible in the bottom right corner of the Messages pane.



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The key tab in the compare deltas is the Summary tab. This tab summarizes the tabs that have deltas. Ideally, the summary should show 0 deltas for each tab on the left, or several deltas between the spreadsheet and the database on the right. All deltas should be cleared as part of the unit testing of the model updates.

Sheet	Delta Count
Spatial References	0
Feature Datasets	0
Tables	0
Fields	0
Domains	0
Domain Values	0
Relationships	0
Anno Feature Classes	0
Anno Classes	0
Subtypes	0
Field Subtypes	0
GN Junction Rules	0
GN Edge Rules	0
Table Model Names	0
Field Model Names	0
Table Programs	0
Field Programs	0
Indexes	0

OR

Sheet	Delta Count
Spatial References	0
Feature Datasets	1
Tables	2
Fields	68
Domains	2
Domain Values	9
Relationships	0
Anno Feature Classes	0
Anno Classes	0
Subtypes	0
Field Subtypes	2
GN Junction Rules	0
GN Edge Rules	0
Table Model Names	0
Field Model Names	0
Table Programs	0
Field Programs	0
Indexes	0



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Apply Data Model Updates to Test Environment

To apply the data model changes to the Test environment, open GeoData Modeler. Create a project for the Test database. Choose the Data Model Spreadsheet with the model modifications. Click run to apply the changes.

The screenshot shows the GeoData Modeler application window. At the top, there is a menu bar with 'File' and 'Help'. Below the menu bar is a toolbar with several icons: 'Report', 'Compare to Excel', 'Compare to Project', 'Upgrade using Excel', and 'Upgrade using Project'. The main workspace is divided into several sections. On the left, there is a table with the following data:

Name	Type	Description
Test	Enterprise Database	sde:oracle@sde:oracle11g:lhdemo2 laurelhill schema Connecting as laurelhill

In the center, there is a blue arrow pointing left with the text 'Updating From' and a database icon. On the right, there is another table with the following data:

Input File	Type	Description
C:\Users\mmccain\Documents\GeoD...	Spreadsheet	

Below these tables is a 'Standard' section with a list of checkboxes:

- Update Geodatabase
- Upgrade Geometric Network R...
- Generate Python
- Set Editor Tracking
- Build Relationships
- Drop Relationships

At the bottom right of the main workspace is a 'Run' button with a checkmark icon. Below the main workspace is a 'Messages' and 'Errors' section. The 'Messages' tab is active, showing the following text:

```
Modifying field alias for field MIGRATIONID to Migration ID in table LAURELHILL.Wetlands
Setting subtype field to on Wetlands
Updating Annotation
187 data model changes made
Process Completed in 00:00:30.0840000
```

The GeoData Modeler logo is visible in the bottom right corner of the message log area.



Unit Test data model updates

Once the updates are applied, run a comparison of the updated Test geodatabases and the spreadsheet. Review the delta spreadsheet to determine if there are any issues with the update. Perform manual data model updates if necessary.

It is recommended that the testing team manually review each of the data model changes that are applied to the Test environment. Once completed, the model updates are ready to be applied to the QA environment.

Apply Data Model Updates to QA or Pre-Production Environment

To apply the data model changes to QA, open GeoData Modeler. Create a project for QA or Pre-Production. Choose the Data Model Spreadsheet with the model modifications. Click run to apply the changes.

Comparison Test Data Model updates

Once the updates are applied, run a comparison of the updated QA and the spreadsheet. Review the delta spreadsheet to determine if there are any issues with the update. Perform manual data model updates if necessary.

Once QA regression testing is complete, the data model updates can be applied to the production data model during a production cutover.



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Run Comparison for Release Note Creation

To assist the line of business with release note creation for data model updates, a comparison is performed between the current production model and the Data Model Spreadsheet. This will show deltas for each change along with the change level meta data that was added for each change. This will greatly reduce the time necessary for the business lead to create release notes for the release.

The screenshot shows the GeoData Modeler application window. The interface includes a menu bar (File, Help), a toolbar with icons for Report, Compare to Excel, Compare to Project, Upgrade using Excel, and Upgrade using Project. Below the toolbar, there are two panels for configuration. The left panel shows the 'Production' database with details: Name (Production), Type (Oracle Database), and Description (Ihdemo3 laurelhill schema Connecting as laurelhill). The right panel shows the 'Input File' as 'sheet\Data Model Spreadsheet.xlsx' with Type (Spreadsheet). A central blue arrow labeled 'Comparing to' points from the database to the spreadsheet. Below these panels is a 'Standard' section with several options: Delta Spreadsheet (Reports the entire data model with highlighted deltas between the two inputs.), HTML Report (Generate an HTML document that describes the database), Domain Length Report (Compare domain value lengths with the lengths of fields that they are assigned to), Orphaned Domains (Find domains that are unassigned), and HTML Report (Beta) (Detailed HTML Report. Coming at version 1.1). A 'Run' button is located at the bottom right of this section. At the bottom of the window, there is a 'Messages' pane showing the following text: 'Comparing Schema', 'Generating output: Delta Spreadsheet', 'The Full Compare Spreadsheet can be found at C:\Users\mmccain\Documents\GeoData Modeler Projects\Production\database_compare Production.xlsx', 'The Deltas Only Spreadsheet can be found at C:\Users\mmccain\Documents\GeoData Modeler Projects\Production\database_compare_deltas Production.xlsx', and 'Process Completed in 00:00:17.7040000'. The GeoData Modeler logo is visible in the bottom right corner of the messages pane.



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Apply Data Model Updates to Production Environment

Once all model changes have passed regression, they can be pushed to production. This process should be done as part of an outage. The outage should include users posting their session and having their access locked. To update the data model, the owner of the database must be able to create schema locks without encountering table locks.

Additionally, the production geodatabase should be fully backed up before the data model updates are applied, as part of a standard cutover procedure to ensure the ability to roll back any changes made during the cutover.

The screenshot shows the GeoData Modeler application window. The title bar reads "GeoData Modeler". The menu bar includes "File" and "Help". The toolbar contains icons for "Report", "Compare to Excel", "Compare to Project", "Upgrade using Excel", and "Upgrade using Project". The "Upgrade using Excel" button is highlighted in blue.

The main workspace is divided into several sections:

- Database Information:** A table with the following data:

Name	Production
Type	Oracle Database
Description	Ihdemo3 laurelhill schema Connecting as laurelhill
- Input File:** A table with the following data:

Input File	sheet\Data Model Spreadsheet.xlsx
Type	Spreadsheet
Description	
- Standard Options:** A list of checkboxes:
 - Update Geodatabase
 - Upgrade Geometric Network R...
 - Generate Python
 - Set Editor Tracking
 - Build Relationships
 - Drop Relationships
- Run Button:** A blue button with a checkmark icon and the text "Run".

A central blue arrow labeled "Updating From" points from the input file section towards the database information section.

At the bottom, there is a "Messages" tab with the following text:
Modifying field alias for field MIGRATIONID to Migration ID in table LAURELHILL.Wetlands
Setting subtype field to on Wetlands
Updating Annotation
187 data model changes made
Process Completed in 00:00:31.2580000

The GeoData Modeler logo is visible in the bottom right corner of the window.



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Final Production Comparison

A final database to database comparison is required to confirm that all changes have been made correctly, and that the production environment matches the QA environment.

The final delta spreadsheet should not contain any deltas for ArcGIS or ArcFM properties. Any deltas should be carefully reviewed. If necessary, changes and modifications should be made to production to completely sync up with the QA environment.

The screenshot shows the GeoData Modeler application window. The title bar reads "GeoData Modeler". The menu bar includes "File" and "Help". The main toolbar contains icons for "Report", "Compare to Excel", "Compare to Project", "Upgrade using Excel", and "Upgrade using Project".

The central workspace is divided into two database configuration panels. The left panel is for the "Production" database, which is an Oracle Database with description "Ihdemo3 laurelhill schema Connecting as laurelhill". The right panel is for the "QA" database, which is an Enterprise Database with description "sde:oracle\$sde:oracle11g:Ihdemo2 laurelhill schema Connecting as laurelhill". A blue arrow labeled "Comparing to" points from the Production database to the QA database.

Below the configuration panels is a "Standard" section with the following options:

- Delta Spreadsheet: Reports the entire data model with highlighted deltas between the two inputs.
- HTML Report: Generate an HTML document that describes the database
- Domain Length Report: Compare domain value lengths with the lengths of fields that they are assigned to
- HTML Report (Beta): Detailed HTML Report. Coming at version 1.1

A "Run" button with a checkmark is located at the bottom right of the configuration area.

At the bottom of the window is a "Messages" and "Errors" pane. The "Messages" tab is active, showing the following text:

```
Comparing Secondary Database
Generating output: Delta Spreadsheet
The Full Compare Spreadsheet can be found at C:\Users\mmccain\Documents\GeoData Modeler Projects\Production\database_compare Production.xlsx
The Deltas Only Spreadsheet can be found at C:\Users\mmccain\Documents\GeoData Modeler Projects\Production\database_compare_deltas Production.xlsx
Process Completed in 00:00:30.1790000
```

The GeoData Modeler logo is visible in the bottom right corner of the messages pane.



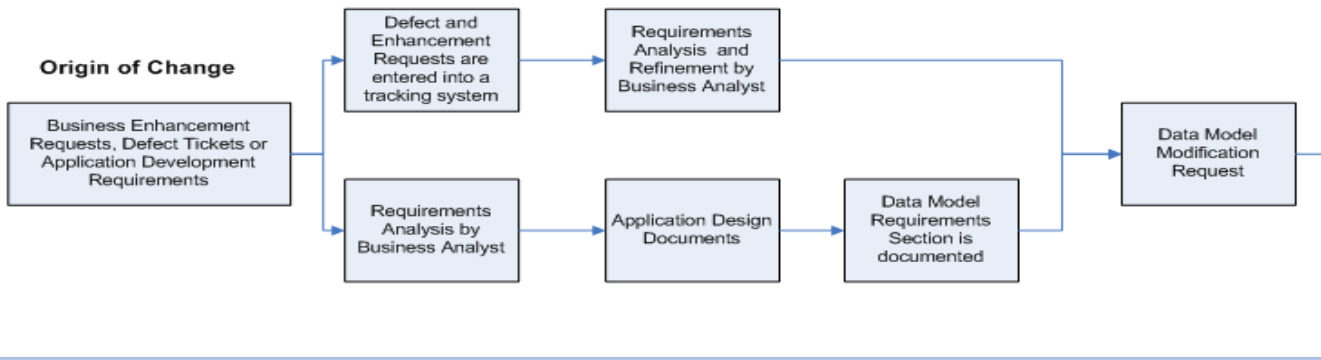
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Data Model Update Process Flow

Change Request Requirements Gathering and Documentation

Business Analyst



Data Model Change Implementation

Data Architect

