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| Teacher Preparation Data Model  Teacher Preparation Program Ed-Fi Extensions v1.0 Setup Guide  November 6, 2017 |

Table of Contents

[About UPD 3](#_Toc507147808)

[About the Teacher Preparation Data Project 3](#_Toc507147809)

[Teacher Preparation Data Model Overview 3](#_Toc507147810)

[TNTP Foundation 4](#_Toc507147811)

[Ed-Fi Core Modifications 4](#_Toc507147812)

[Getting Started 5](#_Toc507147813)

[Ed-Fi ODS/API v2.3 Installation Preparation 5](#_Toc507147814)

[Download the TPDP Extensions 5](#_Toc507147815)

[Install Ed-Fi Core Modifications 6](#_Toc507147816)

[Install TPDM and Related TNTP Extensions 7](#_Toc507147817)

[TPDM/TNTP Extensions 7](#_Toc507147818)

[TNTP Scripts 8](#_Toc507147819)

[Descriptors 9](#_Toc507147820)

[Code/Script Changes/Workarounds 9](#_Toc507147821)

[InitializeDevelopmentEnvironment.psm1 9](#_Toc507147822)

[CodeGenEngine.cs 10](#_Toc507147823)

[CompositeTermInflector.cs 11](#_Toc507147824)

[DomainModelExtensions.cs 11](#_Toc507147825)

[SwaggerMetadataController.cs 12](#_Toc507147826)

[EdFi.Ods.CodeGen\packages.config 12](#_Toc507147827)

[Initialize the Development Environment 13](#_Toc507147828)

[Troubleshooting 13](#_Toc507147829)

[Next Steps 14](#_Toc507147830)

# About UPD

UPD Consulting (www.updconsulting.com) is a company of former educators and public sector leaders who are committed to helping our clients drive change that supports education reform. We bring our inside understanding of education’s challenges to implement effective reform initiatives at scale. For states and districts seeking improvements in performance, UPD provides end-to-end management consulting and technology services with a focus on ensuring that the use of data yields impact.

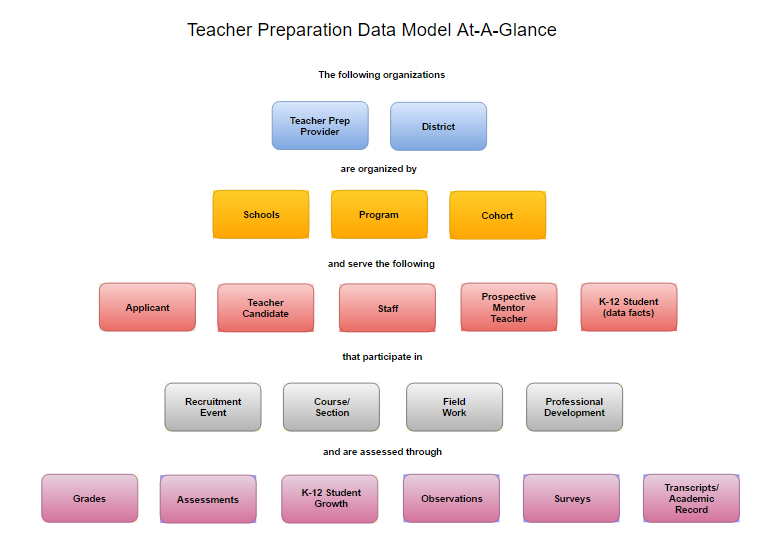
After years of working with clients around the country, UPD recognized a problem common among many state and local education agencies: the information needed to manage and educate effectively was hard to access and even more difficult to have in one place. For this reason, UPD has invested heavily in helping organizations implement Ed-Fi, which we believe is the best solution for creating interoperability, allowing enterprise access to information, and centralizing data management.

# About the Teacher Preparation Data Project

The Teacher Preparation Data Project was initiated in June 2016 to harness and integrate pre-service and in-service data that can be used to better prepare teacher candidates and support the growth of current teachers. The objective of the project was to develop a Teacher Preparation Program (TPP) data standard to enable the appropriate use and exchange of data across teacher preparation partners for the purposes of program improvement. Through a grant funded project, UPD engaged 15 major prep programs and several other education stakeholders to identify key questions which Teacher Preparation Programs, State Education Agencies (SEAs), and Local Education Agencies (LEAs) needed to answer in order to prepare the country’s best teachers. After identifying the data necessary to answer those questions, UPD developed this extension of Ed-Fi known as the Teacher Preparation Data Model (TPDM).

# Teacher Preparation Data Model Overview

The Teacher Preparation Data Model includes: Ed-Fi core data standard, TNTP extensions for Talent Management, and extensions for Teacher Preparation Programs. The TPDM extensions enable data to be integrated over the span of a teacher’s entire career, from entry into a TPP, through knowledge and skills demonstrated in fieldwork experiences, to placement and performance as an in-service teacher. The following diagram depicts a high-level version of the Teacher Preparation Data Model with the intent to display the scope of the model. For UML diagrams of the TPDM, reference **TPDM Tech Doc 1.0**.



## TNTP Foundation

The TPDM builds upon the foundation of a subset of the TNTP Extensions for Teacher Talent Management and includes associated TNTP resources from the Ed-Fi Exchange—they do not need to be downloaded and installed separately. As TPDM is not a complete superset of TNTP and extends some TNTP data definitions, instructions for installing both TPDM and TNTP are currently outside the scope of this document. Attempting to install TPDM over an existing TNTP deployment will lead to incompatibilities. However, enterprising readers may be able to combine the instructions and artifacts from both Ed-Fi Exchange contributions and, with minor modifications, install both full data models.

## Ed-Fi Core Modifications

It should also be noted that TPDM currently uses a slightly modified Ed-Fi Core, including the early incorporation of Credential-related definitions to be included in Ed-Fi Data Model v2.1 and Ed-Fi ODS/API v3.0, as well as a handful of additional map type enumeration values for Ed-Fi Core descriptors. At this time, the TPDM Extensions are incompatible with Ed-Fi ODS/API v2.3’s sample/populated database and, as such, any attempts to run related builds below will specify how to exclude generation of sample/populated databases. A sample/populated database with TPDM Extensions may be available in future updates to the TPDM Extensions.

# Getting Started

Follow the instructions below to apply the TPDM Extensions to the Ed-Fi ODS/API. This Setup Guide is based around Ed-Fi ODS/API v2.3. Some modifications/workarounds may be necessary if attempting to deploy the extensions to another Ed-Fi ODS/API version. It should be noted that a number of workarounds and compromises are in place in the current TPDM Extensions while resolutions to ODS/API v2.3 issues are outstanding. As the TPDM Extensions are envisioned to be a living Ed-Fi Exchange contribution, this document and related artifacts may be updated as the Ed-Fi Alliance releases related issue fixes in v2.4 and v3.0 of the Ed-Fi ODS/API.

## Ed-Fi ODS/API v2.3 Installation Preparation

Confirm that you have successfully downloaded and prepared for installation of Ed-Fi ODS/API v2.3 as described at the following URL, pausing after you have completed the “Verify PowerShell Script Permissions” step of “Step 4. Prepare the Development Environment.”

<https://techdocs.ed-fi.org/display/ODSAPI23/Getting+Started>

Before proceeding to the next step, “Initialize the Development Environment,” you will install TPDM resources, Ed-Fi Core modifications, and implement a handful of code/script changes as described below.

For the sake of these instructions, cloned or downloaded Ed-Fi ODS/API v2.3 repositories will be assumed to reside under:

C:\GitHub\

i.e.:

C:\GitHub\Ed-Fi-ODS

C:\GitHub\Ed-Fi-ODS-Implementation

## Download the TPDP Extensions

The TPDP Extensions are available in GitHub:

<https://github.com/Ed-Fi-TPDP/MetaEd-TPDP-Files>

Either clone or download the repository to your local hard drive. For the sake of these instructions, a destination path of:

C:\GitHub\Ed-Fi-TPDP\MetaEd-TPDP-Files

will be used throughout this document. If downloading the repository, unzip MetaEd-TPDP-Files-master.zip and remove -master from resulting folder names, if desired. If downloading a specific release of the repository, unzip MetaEd-TPDP-Files-<release>.zip and remove -<release> from resulting folder names, if desired.

There are two important sub-folders of MetaEd-TPDP-Files for the purposes of this Setup Guide:

|  |  |
| --- | --- |
| MetaEdOutput | MetaEd-generated XML schemas, ODS SQL Server scripts, etc. These are the main resources associated with the TPDP Extensions and modifications to Ed-Fi Core.  For brevity, C:\GitHub\Ed-Fi-TPDP\MetaEd-TPDP-Files\ will be omitted from paths below. |
| SetupGuideResources | Anywhere a code/script change is required in this document, associated resources that can be used either verbatim or consulted to inform edits to corresponding resources in your Ed-Fi ODS/API installation.  For brevity, C:\GitHub\Ed-Fi-TPDP\MetaEd-TPDP-Files\ will be omitted from paths below. |

If interested, the remainder of the MetaEd-TPDP-Files folders serve as the contents of a MetaEd Project Folder to generate the artifacts in MetaEdOutput.

Note: If you have not previously built the Ed-Fi ODS/API, some generated folders referenced below may not be available. Prior to take any of the following steps, build your Ed-Fi ODS/API without TPDP-related changes, then proceed with the following.

## Install Ed-Fi Core Modifications

#### Metadata

Copy the following files:

DomainMetadata.xml

EdOrgReferenceMetadata.xml

InterchangeOrderMetadata.xml

in:

MetaEdOutput\ApiMetadata

to:

C:\GitHub\Ed-Fi-ODS\Application\EdFi.Ods.Metadata\App\_Packages\Ed-Fi\Metadata

and:

C:\GitHub\Ed-Fi-ODS\Standard\Metadata

#### Schemas

Copy the following files:

MetaEdOutput\XSD\Ed-Fi-Core.xsd

MetaEdOutput\XSD\SchemaAnnotation.xsd

to:

C:\GitHub\Ed-Fi-ODS\Application\EdFi.Ods.CodeGen\App\_Packages\Ed-Fi\Schema

and:

C:\GitHub\Ed-Fi-ODS\Application\EdFi.Ods.Metadata\App\_Packages\Ed-Fi\Schema

#### INTERCHANGES

Copy files matching the following pattern:

Interchange-\*.xsd

in:

MetaEdOutput\Interchange

to:

C:\GitHub\Ed-Fi-ODS\Application\EdFi.Ods.CodeGen\App\_Packages\Ed-Fi\Schema

and:

C:\GitHub\Ed-Fi-ODS\Application\EdFi.Ods.Metadata\App\_Packages\Ed-Fi\Schema

#### ODS Structure

Copy the following files:

0004-Tables.sql

0009-IdColumnUniqueIndexes.sql

in:

MetaEdOutput\ODS-SQLServer

to:

C:\GitHub\Ed-Fi-ODS\Database\Structure\EdFi

## Install TPDM and Related TNTP Extensions

### TPDM/TNTP Extensions

#### Metadata

Copy the following files:

DomainMetadata-Extension.xml

EdOrgReferenceMetadata-Extension.xml

InterchangeOrderMetadata-Extension.xml

in:

MetaEdOutput\ApiMetadata

to:

C:\GitHub\Ed-Fi-ODS-Implementation\Extensions\Metadata

#### Schemas

Copy the following files:

MetaEdOutput\XSD\EXTENSION-Ed-Fi-Extended-Core.xsd

MetaEdOutput\XSD\SchemaAnnotation.xsd

to:

C:\GitHub\Ed-Fi-ODS-Implementation\Extensions\Schemas

#### Interchanges

Copy files matching the following pattern:

EXTENSION-\*.xsd

in:

MetaEdOutput\Interchange

to:

C:\GitHub\Ed-Fi-ODS-Implementation\Extensions\Schemas

#### ODS Structure

Copy the following files:

0001-EXTENSION-extension-Schemas.sql

0004-EXTENSION-extension.sql

0009-EXTENSION-extension-IdColumnUniqueIndexes.sql

in:

MetaEdOutput\ODS-SQLServer

to:

C:\GitHub\Ed-Fi-ODS-Implementation\Database\Structure\EdFi

### TNTP Scripts

Copy the following file:

1002-Insert-Talent-Management-Types.sql

in:

SetupGuideResources\Ed-Fi-ODS-Implementation\Database\Data\EdFi

to:

C:\GitHub\Ed-Fi-ODS-Implementation\Database\Data\EdFi

Copy the following file:

0019-AddCascadingUpdateToSessionTables.sql

in:

SetupGuideResources\Ed-Fi-ODS\Database\Structure\EdFi

to:

C:\GitHub\Ed-Fi-ODS\Database\Structure\EdFi

### Descriptors

Copy the SetupGuideResources\Ed-Fi-ODS-Implementation\Database\Data\EdFi\Descriptors folder

to:

C:\GitHub\Ed-Fi-ODS-Implementation\Database\Data\EdFi

It is OK to replace existing files unless you have made other modifications in the intervening time, in which case you should integrate the changes into SetupGuideResources\Ed-Fi-ODS-Implementation\Database\Data\EdFi\Descriptors\Manifest.xml.

## Code/Script Changes/Workarounds

### InitializeDevelopmentEnvironment.psm1

The following changes—note one is optional--in:

SetupGuideResources\Ed-Fi-ODS-Implementation\Application\SolutionScripts\InitializeDevelopmentEnvironment.psm1

should be made in:

C:\GitHub\Ed-Fi-ODS-Implementation\Application\SolutionScripts\InitializeDevelopmentEnvironment.psm1

As compatibility with Ed-Fi ODS/API v2.3’s sample/populated database is not currently supported and a sample/populated database with TPDP extensions is not currently available, disable sample/populated database generation:

|  |  |
| --- | --- |
| tasks += @(Invoke-InitDevTask 'Reset-PopulatedTemplate') | #$tasks += @(Invoke-InitDevTask 'Reset-PopulatedTemplate') |

As currently there are issues with the Ed-Fi ODS/API v2.3’s console bulk loader loading schools, disable EdOrg loading:

|  |  |
| --- | --- |
| applyEdOrgs = $true | applyEdOrgs = $false |

Finally, optionally change MSBUILD verbosity to normal. There will be more error detail available if a build fails.

|  |  |
| --- | --- |
| $msbuildCommandTemplate = '& "{0}" "{1}" "/verbosity:minimal" "/target:rebuild" "/property:Configuration={2}" "/nr:false"' | $msbuildCommandTemplate = '& "{0}" "{1}" "/verbosity:normal" "/target:rebuild" "/property:Configuration={2}" "/nr:false"' |

### CodeGenEngine.cs

Implement the changes in:

<https://github.com/Ed-Fi-Alliance/Ed-Fi-ODS/commit/a44f2505f02515a13a225c1df701b5934c6572db>

in:

C:\GitHub\Ed-Fi-ODS\Application\EdFi.Ods.CodeGen\XmlShredding\CodeGenEngine.cs

Note the commit changes are not against the v2.3 code base. The corresponding changes for the v2.3 code base are in:

SetupGuideResources\Ed-Fi-ODS\Application\EdFi.Ods.CodeGen\XmlShredding\CodeGenEngine.cs

|  |  |
| --- | --- |
| context.ClassDeclaration  .WriteLine(@"entity.{0} = element.{1}({2})", inlineEntityProperty.PropertyName, assignmentString, elementVariable)  .PushIndent().WriteLine(".Select(x => new {0}", inlineEntityProperty.ClassName)  .PushIndent().WriteLine("{")  .PushIndent().WriteLine("{0} = {1}", inlineEntityProperty.InlinePropertyName, rightSideExpression).PopIndent()  .WriteLine("})")  .PopIndent().WriteLine(".Cast<{0}>()", inlineEntityProperty.InterfaceName)  .WriteLine(".ToList();").PopIndent(); | var inlinePropertyName = inlineEntityProperty.InlinePropertyName;  + if (inlineEntityProperty.ClassName == inlineEntityProperty.InlinePropertyName)  + {  + inlinePropertyName = inlinePropertyName + "X";  + }  +  context.ClassDeclaration  .WriteLine(@"entity.{0} = element.{1}({2})", inlineEntityProperty.PropertyName, assignmentString, elementVariable)  .PushIndent().WriteLine(".Select(x => new {0}", inlineEntityProperty.ClassName)  .PushIndent().WriteLine("{")  .PushIndent().WriteLine("{0} = {1}", inlinePropertyName, rightSideExpression).PopIndent()  .WriteLine("})")  .PopIndent().WriteLine(".Cast<{0}>()", inlineEntityProperty.InterfaceName)  .WriteLine(".ToList();").PopIndent(); |

### CompositeTermInflector.cs

To prevent issues with plurals, the following changes in:

SetupGuideResources\Ed-Fi-ODS\Application\EdFi.Ods.Common\Inflection\CompositeTermInflector.cs

should be made in:

C:\GitHub\Ed-Fi-ODS\Application\EdFi.Ods.Common\Inflection\CompositeTermInflector.cs

|  |  |
| --- | --- |
| AddIgnoreSuffix("Offered"); | AddIgnoreSuffix("Offered");  AddIgnoredSuffix("Facts");  AddIgnoredSuffix("Qualifications");  AddIgnoredSuffix("Vacancies"); |

### DomainModelExtensions.cs

To prevent an issue with properties being generated as both inherited and regular properties, the following changes in:

SetupGuideResources\Ed-Fi-ODS\Application\EdFi.Ods.CodeGen\Extensions\DomainModelExtensions.cs

should be made in:

C:\GitHub\Ed-Fi-ODS\Application\EdFi.Ods.CodeGen\Extensions\DomainModelExtensions.cs

|  |  |
| --- | --- |
| return resource.UnifiedAllProperties()  .Where(x => !ModelComparers.Entity.Equals(resource.Entity, x.EntityProperty.Entity)); | var inheritedProperties = resource.UnifiedAllProperties().Where(x => !ModelComparers.Entity.Equals(resource.Entity, x.EntityProperty.Entity));  if (resource.Entity.Extensions != null && resource.Entity.Extensions.Length > 0)  {  foreach (var extension in resource.Entity.Extensions)  {  inheritedProperties = inheritedProperties.Where(x => !string.Equals(extension.Name, x.EntityProperty.Entity.Name));  }  }  return inheritedProperties; |

### SwaggerMetadataController.cs

To prevent duplicate dictionary keys, the following changes in:

SetupGuideResources\Ed-Fi-ODS\Application\EdFi.Ods.CodeGen\Controllers\SwaggerMetdataController.cs

should be made in:

C:\GitHub\Ed-Fi-ODS\ Application\EdFi.Ods.CodeGen\Controllers\SwaggerMetdataController.cs

|  |  |
| --- | --- |
| .Concat(resource.AllContainedItemTypes.SelectMany(i => ReferencesToRenderForResourceChildItem(filteredResource, i, derivedResourceHasContentTypeUsage)).ToDictionary( | .Concat(resource.AllContainedItemTypes.SelectMany(i => ReferencesToRenderForResourceChildItem(filteredResource, i, derivedResourceHasContentTypeUsage)).GroupBy(r => r.ReferenceTypeName).Select(g => g.First()).ToDictionary( |

### EdFi.Ods.CodeGen\packages.config

As the Ed-Fi Standard has been replaced, the following change in:

SetupGuideResources\Ed-Fi-ODS\Application\EdFi.Ods.CodeGen\packages.config

should be made in:

C:\GitHub\Ed-Fi-ODS\Application\EdFi.Ods.CodeGen\packages.config

|  |  |
| --- | --- |
| <package id="edfi.standard" version="2.0.1" targetFramework="net45" /> | <!--<package id="edfi.standard" version="2.0.1" targetFramework="net45" />--> |

## Initialize the Development Environment

As some solution PowerShell scripts were modified in the steps above, it’s important to close the PowerShell window you have open at this point, opening a new PowerShell window as an administrator as described in “Verify PowerShell Permissions,” navigating to C:\GitHub\Ed-Fi-ODS-Implementation or equivalent, then proceeding with the “Initialize the Development Environment” step of “Step 4. Prepare the Development Environment.” Complete the remainder of the instructions in:

<https://techdocs.ed-fi.org/display/ODSAPI23/Getting+Started>

to complete the TPDP Extensions installation.

## Troubleshooting

For any issues or questions, please submit a ticket to the Ed-Fi Tracker: https://tracker.ed-fi.org/

# Next Steps

There are currently early adopter implementations of the TPDM underway with Teacher Preparation Programs, State and Local Education Agency partners. As the TPDM is a contribution to the Ed-Fi Community, UPD anticipates incorporating learnings and considering revisions to the TPDM based on these initial implementations as well as fixes to the issues outlined in this document. In addition, in October 2017, a new project was initiated to develop a data visualization tool to integrate with the TPDM. UPD is leading the development of this tool and will be following a similar approach to how the TPDM was created – by gathering feedback from many stakeholders to determine the common data visualization needs. This data visualization tool is expected to be complete August 2018 and will also be made available through the Ed-Fi Exchange.