SOLIDWORKS PDM API Fundamentals
(3 days)
Instructor: Amen Jlili

Objective

Students will learn the essential skills of SOLIDWORKS PDM API using VB.NET: understanding the program type and language options available, program setup and architecture, object-oriented programming techniques, Visual Studio, custom development libraries (e.g., CADSharpTools.PDM), documentation, deployment, and administration. The contents of this course is borne out of real-world, customer-driven experience and has never been offered outside of CADSharp LLC.

Certification

CADSharp LLC does not offer any formal certification upon completion of this class. At your request, however, we give you a certificate acknowledging that you completed the training.

Prerequisites

This course assumes that:

1. You know the basics of VB.NET, including variable declaration, functions, passing arguments, conditional statements, and loops. If not, you can easily find free tutorials on YouTube to learn this in under two hours. It might also be useful to review the free VBA Essentials videos at www.cadsharp.com, since VBA and VB.NET are similar in syntax.
2. You have a strong familiarity with SOLIDWORKS PDM and at least some experience with the SOLIDWORKS PDM administration tools.

Environment

You **must** have:

- Visual Studio 2012 or later installed. The Community Edition is free for training purposes.
- Access to a SOLIDWORKS PDM Professional vault with an administrator login. **We highly recommended you have your PDM or system administrator setup a local SQL server and vault for testing purposes on your machine. Connecting to PDM via a VPN may hinder your progress due to potential latency issues.**
- Administrator access to your Windows machine.
- SOLIDWORKS. Preferably 2018 or 2019.
- Microsoft Office Excel 2007 or higher.

What the instructor will be using:

- Visual Studio 2017 Community Edition.
- SOLIDWORKS PDM Professional 2019 / SQL Server 2017.
- SOLIDWORKS 2018 SP4.0 or SOLIDWORKS 2019 SP0.
- Microsoft Office Excel 2013 x64.

Resources

Every student will have access:
- Slack channel for quick sharing of notes, files, and code snippets.
- pDrive (similar to Dropbox) folder set up for the class. This will allow the teacher and students to easily share information with one another during the class.
- **A one year membership to CADSharp.com, which gives access to all our training videos, written tutorials, tech support, and .NET developer tools.**

Day One: VB.NET and SOLIDWORKS PDM API Fundamentals

1. General overview of program types and languages available to SOLIDWORKS PDM API developers:
   a. Program Types: standalones, addins, custom addins tasks, task macros and dispatch (discussed only).
   b. Languages: VB.NET, C# (discussed only), C++ (discussed only)
2. Learning through an Example (standalone):
   a. Getting started in Visual Studio.
   b. A Rite of Passage: The `EdmVault5` class and `IEdmVault5` interface:
      i. Getting vault view names.
      ii. How to login in: `Login`, `LoginAuto`, `LoginEx` – Which one to use?
   c. SOLIDWORKS PDM API fundamentals:
      i. API offline Help.
      ii. SOLIDWORKS PDM API Object Model: (Includes discussion and QA)
   d. Working with `IEdmVariableMgr5`
   e. Traversing a PDM folder structure: (Includes discussion about the Iterator Pattern)
   f. Getting variables values:
      i. Approach one: `IEdmVariableEnumerator5`
      ii. Approach two: `IEdmBatchUpdate2`
      iii. Discussion and generalization to other interfaces.
   g. Exporting data to Excel:
      i. Approach one: Using Excel PIA (Primary Interop Assembly).
      ii. Approach two: Using the EPPlus Nuget package.
      iii. Discussion / QA: *COM VS .NET.*
   h. Saving data back onto SOLIDWORKS files using the Document Manager API.

Day Two: PDM Addins

3. Recap/QA of Day 1.
4. PDM addins:
    a. Implementing the `IEdmAddIn5` interface:
        i. `GetAddInInfo()` and its parameters.
        ii. `OnCmd()` and its parameters.
    b. Building and deploying your PDM addins.
    c. Debugging techniques.
    d. Comparison between standalones and PDM addins: *When to use each solution?*
5. Learning through an Example (AddIn):
    a. Adding command menu to the vault view.
    b. Working with Bill of Materials:
        i. Computing a Bill of Materials using references (IEdmReference5)
        ii. Using the IEdmBOM interface to get a bill of materials.
    c. Exporting Bill of Materials to Excel using EPPlus.
    d. Adding exported Bill of Materials as a custom reference.

Day Three: Custom Task Addins

3. Recap/QA of Day 2.
4. Custom task addins:
    a. TaskSetup
    b. TaskLaunch
    c. TaskDetails
    d. TaskLaunchButton
    e. TaskSetupButton
    f. TaskRun
5. Converting PDM addin to a task addin.
6. Building and deploying addin.
7. Debugging techniques.
8. QA/Discussion.
9. Class conclusion