Microsoft Dynamics GP 2013 R2

Choosing a Development Tool

White Paper

This paper provides guidance when choosing which development tool to use to create an integration for Microsoft Dynamics GP.

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Table of Contents

CHOOSING A DEVELOPMENT TOOL

Available tools

Several development tools are available that can be used to create integrations with Microsoft Dynamics GP. The following is a list of the tools that can be used:

- Dexterity
- Modifier with VBA
- Visual Studio Tools for Microsoft Dynamics GP
- Continuum
- eConnect
- Web Services for Microsoft Dynamics GP
- Integration Manager
- ODBC

A detailed description of each tool is provided in this document. You can use this information and the comparison charts at the end of the document to help you make a decision about the best tool to use for a specific integration. The Microsoft Dynamics GP Architecture white paper also provides information that can help you choose the appropriate tool for your integration.

Factors in the development tool choice

Four main factors will influence which tool you choose: the type of integration, the capabilities required for the integration, the developer skill set, and tool licensing costs.

Type of integration

Integrations for Microsoft Dynamics GP can be categorized into two main types: *user-interface* and *database*.

User-interface integrations involve tasks like the following:

- Customizing the appearance of Microsoft Dynamics GP windows
- Adding controls to Microsoft Dynamics GP windows
- Adding windows to Microsoft Dynamics GP
- Integrating with Microsoft Dynamics GP navigation
- Integrating with Microsoft Dynamics GP lists
- Integrating with Microsoft Dynamics GP workflow

Database integrations involve tasks like the following:

- Importing data into Microsoft Dynamics GP
- Exporting or extracting data from Microsoft Dynamics GP
- Keeping data in Microsoft Dynamics GP synchronized with an external system
- Creating tables to store additional data for Microsoft Dynamics GP

Integrations may include both types of tasks.

Capabilities required

Depending on the functional requirements of the integration you are creating, you may find some development tools are better suited for the task than others. Some tools can be used only for one type of integration. For example, eConnect can be used for database integration tasks. It has no capabilities for interface-level integrations.

For other types of integrations, several of the available tools could be used. For example, assume you needed to create a new window that will appear in Microsoft Dynamics GP. Dexterity, Visual Studio Tools for Microsoft Dynamics GP, Modifier with VBA, and Continuum can be used to create new windows. Additional requirements will help determine which is the best tool to use. If requirements indicate that you must use a specific .NET control for the new window, you can reduce the list to Visual Studio Tools for Microsoft Dynamics GP and Continuum. These are the only two tools that can directly support using a .NET control on a new window. The comparison charts at the end of this document will help you evaluate the capabilities of each tool.

Developer skill set

The skill set of the developer who will be creating the integration is an important consideration when choosing the development tool to use. Developers with more skills will have more options.

Some examples will help illustrate the point. For developers that have a strong background in .NET-based development and Visual Studio, creating an integration using Visual Studio Tools for Microsoft Dynamics GP is an ideal fit. For developers who are creating database integrations and are familiar with Web development and XML Services, using Web Services for Microsoft Dynamics GP may be the best solution.

Some development tools available for Microsoft Dynamics GP are specifically designed to allow system administrators or novice developers to create integrations without requiring an extensive background in software development. Tools like Integration Manager and Modifier fit this category.

Integration Manager is an excellent tool for creating database integrations. It provides a graphical interface for importing data from external sources into Microsoft Dynamics GP. No coding is necessary for most integrations. The data is verified before being imported, helping ensure system integrity.

Availability and licensing

In some cases, the availability and licensing costs of an integration tool will influence whether that tool is the best to use for an integration. Some of the tools available for Microsoft Dynamics GP have both a development component used to create the integration and a runtime component that is used when the integration is deployed. The costs for both the development component and the runtime component should be considered when making a tool selection.

Microsoft Dynamics GP SDK

The Microsoft Dynamics GP SDK is an additional documentation component that you will use in conjunction with the development tools as you create your integration. The Dynamics GP SDK provides information about the Microsoft Dynamics GP core product and several additional products available for Microsoft Dynamics GP, such as Human Resources, Manufacturing, and Field Service.

The SDK provides the following types of information:

- Design documents for the procedures and functions in Microsoft Dynamics GP

- Parameter lists for the procedures and functions

- Database diagrams showing the table structures

- Design documents for the database

- Transaction flow documents

- Dictionary changes from the previous version of Microsoft Dynamics GP

4

The information you use will depend on the type of integration you are creating. For example, if you were using ODBC to directly retrieve information from Microsoft Dynamics GP tables, you would find the database diagrams, database design documents, and transaction flow documents helpful. If you were developing an integration that used procedures and functions from a Microsoft Dynamics GP dictionary, the procedure and function parameter lists would be helpful.

Tool reference

The following sections of this document provide a detailed description of each development tool available for Microsoft Dynamics GP. The main capabilities of the tool are listed, along with the skills that will be helpful when using the specific tool. Use all of this information to help you decide which tool or tools are appropriate for the type of integration you are creating. The following tools are described:

- Dexterity

- Modifier with VBA

- Visual Studio Tools for Microsoft Dynamics GP

- Continuum

- eConnect

- Web Services for Microsoft Dynamics GP

- Integration Manager

- ODBC

Refer to the documentation for each tool for complete details about using it to develop integrations for Microsoft Dynamics GP. The documentation is available in the Microsoft Dynamics GP Developer Center on MSDN (http://msdn.microsoft.com/dynamics/gp).

Dexterity

Dexterity is the development tool used to create the Microsoft Dynamics GP application. It can be used by software developers to create both user interface and database integrations.

Capabilities of Dexterity

Dexterity is a complete integrated development environment. Features of Dexterity include:

Capability	Description
Graphical forms designer	A WYSIWYG layout window used to design forms visually.
sanScript scripting language	An English-like scripting language used to add business logic to the application.
Extensive function library	Hundreds of special-purpose functions allow implementing key functionality in an application.
Integrated script debugger	Allows interactive debugging of an application.
Structured exception handling	A built-in mechanism for dealing with unexpected conditions in the application.
COM support	Excellent access to features made available by other applications through COM.
Integrated Source Code Control	Built-in support for managing application resources. Microsoft Visual SourceSafe or Team Foundation Server (TFS) can be used as the repository.
Built-in Report Writer	A WYSIWIG report layout tool used to design reports.

Integrations created with Dexterity use the multidictionary architecture to operate seamlessly with Microsoft Dynamics GP. They can also use the extensive trigger system in the Microsoft Dynamics GP runtime to be notified of events. The best user interface integrations are created with Dexterity. These integrations work in both the desktop client and the web client. Dexterity-based integrations can interact with the Dynamics GP navigation, lists, and action pane. These integrations can also contain new commands (special application resources) that are used for menus, toolbars, and actions in the list action panes. The other integration tools available cannot.

Skills needed for Dexterity

Previous experience with software development is helpful when learning to create Microsoft Dynamics GP integrations with Dexterity. The following skills will be helpful:

- An understanding of an application development environment such as Microsoft Visual Studio
- A background with a programming language such as Visual Basic
- Experience with database design
- An understanding of client/server architecture

Delivering an integration

An integration can be installed by any Microsoft Dynamics GP customer.

Modifier with VBA

The Modifier with VBA is a customization tool that is available with every Microsoft Dynamics GP client installation. It is used to modify the appearance and functionality of Microsoft Dynamics GP windows, including those created by third-party applications. Designed primarily for system administrators and implementation specialists, safety is a primary focus of this tool. Original information in the system cannot be lost or overridden. All modifications made are stored separately from the core product. This allows modifications to be removed and also preserved when the system is upgraded.

Capabilities of the Modifier with VBA

The Modifier is a graphical environment that allows customizing the Microsoft Dynamics GP interface. Features provided by the Modifier include:

Capability	Description
Modify Microsoft Dynamics GP windows	The appearance of windows and fields in Microsoft Dynamics GP can be modified. Common actions include changing prompts, hiding fields, and rearranging window items.
Creating new fields	New fields can be added to windows. These fields can be accessed by VBA code. They can also be accessed by integrations created with Visual Studio Tools for Microsoft Dynamics GP and Continuum.
Global resource modifications	Global modifications can be made that affect the entire application. Common modifications include changing field formats, changing keyable lengths, modifying strings, and modifying messages.

The VBA environment in Microsoft Dynamics GP is the same integrated development environment found in other products like Microsoft Office. The standard features of VBA, such as the integrated script debugger, are available. Additional features provided by VBA in Microsoft Dynamics GP include:

Capability	Description
Window creation	New windows can be created for Microsoft Dynamics GP.
Access to Microsoft Dynamics GP application resources	Resources like windows, fields, and reports can be accessed through Visual Basic scripts.
Events for Microsoft Dynamics GP resources	Events can be attached to resources like windows and fields. This allows VBA code to run in response to user actions.
Data storage	The Dynamic User Object Store (DUOS) can store additional data.
Deployable integrations	Package files can be used to deploy an integration created with VBA.

Skills needed for the Modifier with VBA

The Modifier with VBA can be used by end users and developers. End users can use the Modifier to make simple cosmetic changes to the system. No developer experience is required for these tasks, though knowledge of Microsoft Dynamics GP administration is helpful. More experienced users and developers can use the VBA environment to add new windows, controls, and business logic to the system. Experience with software development and scripting languages will be helpful.

Delivering an integration

An Integration can be installed by any Microsoft Dynamics GP customer that has purchased Modifier with VBA or the Customization Site License.

Visual Studio Tools for Microsoft Dynamics GP

Visual Studio Tools for Microsoft Dynamics GP allows a developer to use Microsoft Visual Studio and the .NET Framework to create integrations for Microsoft Dynamics GP. These integrations are created entirely in managed code, and can use the extensive features provided by the .NET Framework.

Capabilities of Visual Studio Tools for Microsoft Dynamics GP

Visual Studio Tools provides the following capabilities:

Capability	Description
Window creation	Developers can create forms in .NET that look like standard windows in Microsoft Dynamics GP.
	For the desktop client, the native .NET forms that define the windows can use any available .NET controls.
	For the web client, .NET forms that use controls from the supported list are rendered automatically. If other .NET controls are used, custom rendering can be implemented so that the form can be displayed in the web client.
Access to Microsoft Dynamics GP application resources	Resources like windows, fields, and tables can be accessed through .NET code. Can access fields added with the Modifier.
Events for Microsoft Dynamics GP resources	Can register for events that occur for resources like windows and fields. This allows .NET code to run in response to user actions.
Deployable integrations	Assemblies created with Visual Studio Tools are deployed simply by copying them to the AddIns folder.

Skills needed for Visual Studio Tools for Microsoft Dynamics GP

Previous experience with software development is helpful when learning to create Microsoft Dynamics GP integrations with Visual Studio Tools. The following skills will be helpful:

- Experience creating applications with Microsoft Visual Studio
- A background with a .NET programming language such as C# or Visual Basic
- Familiarity with the resources in the dictionaries used for Microsoft Dynamics GP
    - Events will be registered for resources in the dictionary
    - Tables will be accessed
    - Procedures and functions will also be used
- Knowledge of the .NET Framework

Delivering an integration

An integration can be installed by any Microsoft Dynamics GP customer.

Continuum

Continuum is the COM programming interface available for Microsoft Dynamics GP. It allows a developer to create integrations with development tools that support a COM programming interface. In many cases, these are legacy applications created with older development tools like Visual Basic 6.

Capabilities of Continuum

The Continuum programming interface provides the following capabilities:

Capability	Description
Access to Microsoft Dynamics GP application resources	Resources like windows, fields, and tables can be accessed through COM methods or pass-through sanScript. Can access fields added with the Modifier.
Events for Microsoft Dynamics GP resources	Can register for events that occur for resources like windows and fields. This allows code in the Continuum integration to run in response to user actions.
Pass-through sanScript	Provides the ability to run blocks of sanScript code in the Microsoft Dynamics GP application.

The Continuum (COM) programming interface doesn't have the same level of integration capabilities as other interfaces, such as the .NET programming interface used by Visual Studio Tools for Microsoft Dynamics GP. Much of the functionality for Continuum-based integrations is performed with pass-through sanScript.

Skills needed for Continuum

Previous experience with software development is helpful when learning to create Microsoft Dynamics GP integrations with Continuum. The following skills will be helpful:

- Experience creating COM integrations with the chosen development tool.

- Familiarity with the resources in the dictionaries used for Microsoft Dynamics GP.

- Knowledge of the sanScript language used by Dexterity. A special sanScript documentation supplement is included with Continuum documentation.

Delivering an integration

An integration can be installed by any Microsoft Dynamics GP customer.

eConnect

eConnect is a set of files, tools, and services that allow applications to integrate with Microsoft Dynamics GP data. It is the primary platform for importing and exporting data. eConnect contains a special set of SQL stored procedures that are installed on the SQL Server managing Microsoft Dynamics GP data. These stored procedures allow data to be imported into or exported from tables in Microsoft Dynamics GP. Logic in the stored procedures ensures that only valid data is imported.

eConnect serves as a data access platform. Other data integration tools, such as Web Services for Microsoft Dynamics GP and Integration Manager, use eConnect to provide their core capabilities. eConnect uses XML documents to import or export data. These documents must conform to special schemas that define the structure of each type of document that can be imported or exported.

Capabilities of eConnect

eConnect provides the following capabilities:

Capability	Description
Real-time access to Microsoft Dynamics GP data	eConnect provides real-time access to back office data. It offers a way to add up-to-date back office information to existing front office applications like Web storefronts or service applications.
Multiple programming interfaces	Several programming interfaces are available for eConnect, allowing various tools to be used for integrations. The available programming interfaces are described later in this section.
Data validation	Business logic in eConnect helps ensure that only valid data is imported into Microsoft Dynamics GP.
Extendable business logic	Developers can extend this business logic to perform additional actions needed by an integration.

Several programming interfaces are included with eConnect. The following table lists them:

Capability	Description
eConnect .NET Assembly	The .NET interface used to interact with eConnect.
Microsoft Message Queue (MSMQ)	Provides a loosely-coupled, message-based interface for eConnect.
eConnect Integration Service	A Windows Communication Foundation (WCF) service that enables you to perform specified operations using eConnect XML documents.
SQL Stored Procedures	The stored procedures defined by eConnect, which can be used directly.

The programming interface you choose will depend on the type of application you are integrating to Microsoft Dynamics GP, and the tools you are using to create the integration.

Skills needed for eConnect

Previous experience with data integrations is helpful when learning to create Microsoft Dynamics GP integrations with eConnect. The following skills will be helpful:

- Familiarity working with XML documents and XML schemas.
- Experience with the chosen development tool.
- Knowledge of the various documents in Microsoft Dynamics GP.
- Familiarity with Windows Communication Foundation (WCF) services.

Delivering an integration

An integration can be installed by any Microsoft Dynamics GP customer that has installed the eConnect runtime components.

Web Services for Microsoft Dynamics GP

Web Services for Microsoft Dynamics GP provides standard Web service interfaces that can be used to access data in the accounting system. Web services use standard Internet transport protocols such as Hypertext Transfer Protocol (HTTP) and standard XML-based document formats such as Simple Object Access Protocol (SOAP) to exchange information. Windows Communication Foundation (WCF) is used as the foundation to implement the Web Services for Microsoft Dynamics GP. It provides the support for the standard protocols that make the Web service accessible. The Dynamics GP service uses eConnect to provide access to the data managed by the accounting system.

Capabilities of Web Services for Microsoft Dynamics GP

Web Services for Microsoft Dynamics GP provides the following capabilities:

Capability	Description
Real-time access to Microsoft Dynamics GP data	Web Services for Microsoft Dynamics GP provides real-time access to back office data. Through the Web service, integrating applications can retrieve documents, create new documents, update existing documents, and delete or void documents.
Access to primary documents	The primary documents in the system can be accessed, such as customers, vendors, sales documents, purchase documents, receivables transactions, payables transactions, general ledger transactions, and accounts.
Data validation	Business logic in eConnect (which provides data access for Web Services) helps ensure that only valid data is imported into Microsoft Dynamics GP.
Security	Individual Web service operations can be secured through the Dynamics Security Service, included with Web Services for Microsoft Dynamics GP.
Extensible documents	Developers can use the Web service extensions to add additional data to documents in the Microsoft Dynamics GP service.
Additional services	Developers can use the Dynamics GP Service framework to create new services that access data in Microsoft Dynamics GP.

Skills needed for Web Services for Microsoft Dynamics GP

Previous experience with data integrations is helpful when learning to create Microsoft Dynamics GP integrations with Web Services for Microsoft Dynamics GP. The following skills will be helpful:

- Experience with the chosen development tool used to access the service.

- Familiarity with working with Web services.

- Knowledge of the various documents in Microsoft Dynamics GP.

- If not using a service proxy, familiarity working with XML documents and XML schemas.

Delivering an integration

An integration can be installed by any Microsoft Dynamics GP customer that has installed the Web Services for Microsoft Dynamics GP runtime components.

Integration Manager

The Integration Manager is a separate application used to import data into Microsoft Dynamics GP. Integration Manager is a graphical application, and is designed to be easy to use. Programming skills are not required to perform data integrations.

Capabilities of Integration Manager

Integration Manager provides the following capabilities:

Capability	Description
Import data from various sources	Integration Manager can import data into Microsoft Dynamics GP from various sources, such as text files or Microsoft Excel spreadsheets.
Graphical data mapping	A graphical interface in the Integration Manager makes it easy to map items in the source data to the destination object in Microsoft Dynamics GP, such as a Sales Order Processing document.
Data validation	All data imported by the Integration Manager is validated, helping to ensure the integrity of the accounting system.
Data defaulting	Only required fields must be supplied. Nonessential fields have default values that will be used if no value from the source is specified.
Batch imports	Multiple integration tasks can be combined into a batch and started in one step.
Scripting support	Scripts (written in VBScript) can be attached to various events in the integration process. For instance, as values are imported from the source documents, a script can set the value of a field in the destination object based on the value of another source field in the integration.

Skills needed for Integration Manager

When using Integration Manager, the following skills will be helpful:

- Knowledge of the various documents in Microsoft Dynamics GP.

- Experience with accessing data sources, such as ODBC.

- Scripting experience if you will be attaching scripts to integrations you create.

Delivering an integration

An integration can be installed by any Microsoft Dynamics GP customer that has purchased a license for Integration Manager.

ODBC

ODBC (Open Database Connectivity) is an industry standard for accessing databases. Developers can use ODBC drivers to access data in Microsoft Dynamics GP. ODBC drivers can be used to retrieve data for uses like reporting. They can also be used to write data to the Microsoft Dynamics GP database.

ODBC drivers are commonly used in conjunction with other integration technologies. For instance, you might use ODBC drivers to access data in Microsoft Dynamics GP in an integration created with VBA.

Skills needed for ODBC drivers

Developers who create integrations that access Microsoft Dynamics GP data will need a thorough understanding of the table structure in the application. The Microsoft Dynamics GP SDK provides table structure and transaction flow information that will be helpful. When using ODBC drivers to write data directly to the database, be aware that there is no data validation. Data in the system could be damaged.

Delivering an integration

An integration can be installed by any Microsoft Dynamics GP customer.

Comparison chart – User interface integrations

The following chart compares the development tools available for Microsoft Dynamics GP that can perform user interface-level integrations.

	Dexterity	Visual Studio Tools	Modifier with VBA	Continuum
Developer skill level Fewer = easier	▲▲▲ (3)	▲▲▲ (3)	▲▲ (2)	▲▲▲ (3)
Maturity Fewer = newer	▲▲▲▲ (4)	▲ (1)	▲▲▲ (3)	▲▲▲ (3)
Integration can be created with .NET	No	Yes	No	Yes
Language(s) used	sanScript	C# VB .NET	VBA	Any COM-compliant language .NET through interop
Requires sanScript knowledge	Yes	No	No	Yes
Supports pass-through sanScript	Yes	No	No	Yes
Works with Microsoft Dynamics GP Web Client	Yes	Yes (UI integrations supported starting with GP 2013 SP2)	Yes (VBA is not supported)	No
Access to window and form events	Yes	Yes	Yes	Yes
Access to database events	Yes	No	No	Yes
Can create new windows	Yes	Yes	Yes (modal only)	Yes (external to process)
Can add new controls to Microsoft Dynamics GP windows	Yes	No	Yes	No
Integrations look like Microsoft Dynamics GP More = better	▲▲▲▲ (4)	▲▲▲ (3)	▲▲▲ (3)	▲ (1)
Can access controls added with the Modifier	No	Yes	Yes	Yes
Can modify Microsoft Dynamics GP window layout	Yes	Yes	Yes	Yes
Can use .NET controls on windows	No	Yes	No	Yes
Can create new commands	Yes	No	No	No

	Dexterity	Visual Studio Tools	Modifier with VBA	Continuum
Can execute commands	Yes	Yes	No	Yes (Pass-through sanScript)
Can add to Dynamics GP menus and navigation	Yes	Yes (To "Additional" menu)	No	Yes (To "Additional" menu)
Can integrate with Microsoft Dynamics GP lists	Yes	No	No	No
Can create new Microsoft Dynamics GP lists	Yes	No	No	No
Can create new Report Writer reports	Yes	No	No	No
Access to report events	No	No	Yes	No
Access to modal dialog events	No	Yes	Yes	Yes
Can be used with Dynamics GP macro system	Yes	Yes (With additional code)	Yes (For modified windows)	No
Can create new workflow types	Yes	No	No	No
Can extend existing workflow types	Yes	No	No	No
Access to global variables	Yes	Yes	Yes (only user information)	Yes (Pass-through sanScript)
Fully integrated debugging	Yes	Yes	Yes	No
Easily packaged and deployed to other workstations	Yes (.cnk files)	Yes (.NET assemblies)	Yes (.package files)	Yes (.exe files)

Comparison chart – Database integrations

The following chart compares the development tools available for Microsoft Dynamics GP that can perform database-level integrations.

	Dexterity	Visual Studio Tools	Continuum	eConnect	Web Services	Integration Manager	ODBC
Developer skill level Fewer = easier	▲▲▲	▲▲▲	▲▲▲	▲▲▲	▲▲	▲	▲▲▲▲
Maturity Fewer = newer	▲▲▲▲	▲	▲▲▲	▲▲▲	▲	▲▲▲	▲▲▲▲
Integration can be created with .NET	No	Yes	Yes	Yes	Yes	No	Yes
Language(s) used	sanScript	C# VB .NET	Any COM-compliant language. .NET through interop	.NET languages such as C# and VB.NET	Typically .NET languages such as C# and VB.NET	VBScript	Any language that can work with ODBC connections
Requires sanScript knowledge	Yes	No	Yes	No	No	No	No
Can directly access Microsoft Dynamics GP tables	Yes	Yes	No (Pass-through sanScript only)	No	No	No	Yes
Can create new tables accessible in Microsoft Dynamics GP	Yes	No	No	No	No	No	No
Access to database events	Yes	No	Yes	Yes	No	No	No
Uses business objects to access data	No	No	No	Yes	Yes	Yes	No
Data validation built in	No	No	No	Yes	Yes	Yes	No
Supports queuing (MSMQ)	No	No	No	Yes	No	No	No

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