



Microsoft Dynamics NAV

# ISV Software Solution Test Guidelines

March 2010

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# **INTRODUCTION**

## **PROGRAM OVERVIEW**

Welcome to the Microsoft Dynamics® ISV Software Solution Test Guidelines for Microsoft Dynamics NAV 2009. This document describes the requirements that an independent software vendor (ISV) solution must meet to integrate and operate with Microsoft Dynamics NAV 2009.

The goals of the test are to increase the quality of solutions that run in the Microsoft Dynamics NAV environment and to assure the market that ISV solutions that are built on Microsoft Dynamics NAV meet technical requirements that ensure a high standard.

The test guidelines are designed to walk you through the test process and to help you ensure that your solution can meet the requirements. The test guidelines are described in individual, subject-based modules and provide detailed information about the summary and intent, additional resources, compliance, test methodology, and criteria for passing. Some guidelines may be common to other Microsoft Dynamics tests.

To pass the test, you must demonstrate the development quality of your solution and your ability as a software company to maintain and enhance that solution in the future. The test is administered and conducted by a third-party vendor and includes a technical review and an in-lab inspection.

This document contains the following sections:

- The Introduction section explains the purpose and high-level requirements of the test.
- The [Testing Process](#) section describes how the testing process works from qualification through communication of test results.
- The [Documentation Requirements](#) section provides a list of the documentation that you must submit with your solution.
- The [ISV Software Solution Requirements and Recommendations](#) section defines each requirement and recommendation category, how these requirements and recommendations are tested, and what you can do to ensure that your solution meets the requirements.
- The [Best Practice Guidelines](#) section provides information about best practices for design and development, user experience, and trustworthy computing.

We welcome your comments and suggestions. Send an e-mail message to [dyncert@microsoft.com](mailto:dyncert@microsoft.com) with your feedback.

## **SUPPORTED PRODUCT VERSIONS**

ISV solutions that are submitted for testing must run on Microsoft Dynamics NAV 2009 with the latest service pack installed.

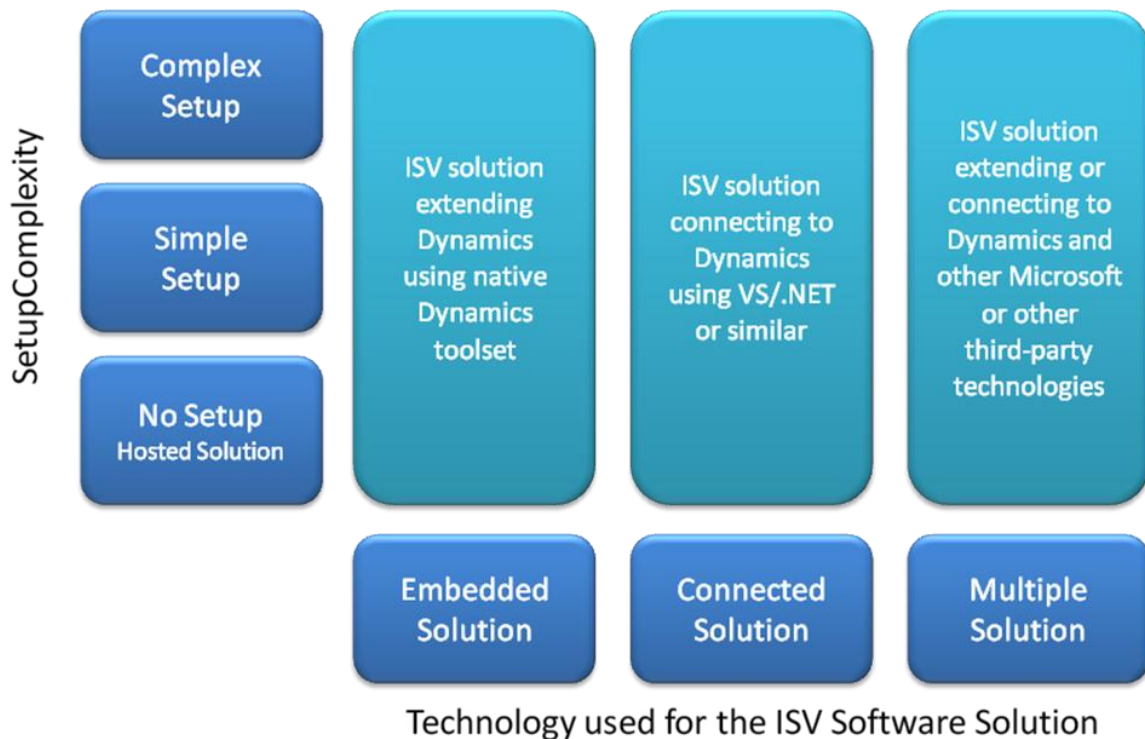
Microsoft Dynamics NAV 2009 includes two clients: the Classic client and the RoleTailored client.

This document applies only to ISV solutions that target the RoleTailored client. Therefore, you must design a RoleTailored experience. However, your solution can also have functionality that runs on the Classic client if there is a valid justification for it.

## TYPES OF SOLUTIONS

Microsoft Dynamics solutions fall into three general categories and three setup complexity levels. The category and setup complexity of a solution determines the type and complexity of the testing requirements and the costs that are associated with testing the solution.

Figure 1 shows the different solution categories and setup complexity levels.



**Figure 1** Solution categories and setup complexity levels

ISV solution complexity falls into one of the following categories, which are listed from least complex to most complex:

- An *embedded* or in-product solution is an ISV solution that extends Microsoft Dynamics NAV by using only the tools that are provided with Microsoft Dynamics NAV. For example, an embedded solution can be built in C/SIDE, which is a proprietary development environment for Microsoft Dynamics NAV. These solutions are built with a RoleTailored experience.
- A *connected* solution is an ISV solution that uses Microsoft® Visual Studio®, the Microsoft .NET Framework, or similar tools to connect to Microsoft Dynamics NAV.

A connected solution typically refers to a stand-alone product that interoperates with Microsoft Dynamics NAV by using it as a business rules engine. The solution can establish interoperability with Web services, .NET assemblies, or COM interoperability. The solution does not need to be

based on the .NET Framework. However, it must run on a supported version of a Microsoft operating system.

- A *multiple* solution is one that connects to or extends Microsoft Dynamics NAV and other Microsoft or third-party technologies.

Setup complexity falls into one of the following categories, which are listed from least complex to most complex:

- *No setup*, which can be a hosted solution, provides services to end users who do not have to purchase, set up, or maintain the software or hardware. Installing and configuring a hosted solution can be complex, and the test vendor may not have the hardware, custom software, or services that the solution requires.
- A *simple* setup is one that the test vendor can install and configure without requiring a restorable backup, Virtual PC images, or other additional assistance.
- A *complex* setup is one that the test vendor cannot completely replicate, such as a solution that require specific hardware, custom software, or back-end services that the vendor cannot duplicate.

## TEST VALIDITY

Test results are valid for 24 months. When the ISV solution is retested, it must be updated to support the latest version of Microsoft Dynamics NAV with the latest service pack installed.

## MORE INFORMATION

For more information about the functionality of Microsoft Dynamics NAV, see the [Microsoft Dynamics NAV](#) page at.

For more information about the Microsoft Partner Program, see the [Microsoft Worldwide Partner Portal](#) home page.

For more information about how the ISV test helps you earn partner program points, see the [ISV Software Testing Framework](#) page.

For more information about the Microsoft Dynamics ISV/Software Solutions competency, see the [Microsoft Dynamics Testing for ISVs](#) page.

## **TESTING PROCESS**

Microsoft offers ISV solution testing through a third-party test vendor. You can register for the test by visiting the test vendor's Web site that is linked to from the [Microsoft Dynamics Testing for ISVs](#) page. The vendor site contains a description of the test, an application form, and a test fee schedule.

Depending on the type and setup of your solution, different test methods will apply, and the test fee will vary. You can make your solution available to the test vendor for testing by using one of the following methods:

- Providing the solution with installation instructions.
- Sending a Microsoft Virtual PC image of a working configuration of the solution,
- Using an interactive Microsoft Office Live Meeting session to provide access to a working configuration of the solution.

After you register your solution and pay the test fee, the test vendor will contact you with information about the testing process that you have selected. For processes that involve shipping software or Virtual PC images to the test vendor, you can choose to send the solution on media (CD or DVD), upload your solution to an FTP server, or have the test vendor download your solution from your server. If you choose to use Live Meeting to provide access to your solution, the test vendor will contact you to schedule the session.

You must meet the following requirements:

- You must be prequalified, and you are responsible for making certain that your solution and organization meets the requirements for submitting and maintaining a Microsoft Dynamics NAV–based solution.
- You must submit documentation, which is identified in the appropriate test modules and in the summary checklist, as part of the test. For more information, see [Documentation Requirements](#).
- You must upload your solution and all supporting documents to the test vendor's servers for testing. If your setup is complex, then you must be prepared to use Live Meeting to demonstrate the solution and solution deployment to the test vendor.

## DOCUMENTATION REQUIREMENTS

The checklists in this section describe the documentation that you must include when you submit your solution. Because a single document can contain information that meets multiple requirements, you may have fewer documents than the number of items on this checklist. Also, some documentation requirements only apply in certain situations. For more information, see the full requirement description.

## SOFTWARE TEST REQUIREMENTS

The following checklist describes the documentation that you must include when you submit your solution for first-time testing.

Requirement	Included
Your solution with product documentation. You can provide this with distributable media, a Virtual PC image, or a Live Meeting session to demonstrate your solution.	
Description of the business functionality that your solution provides and examples of key usage scenarios. See <a href="#">Appendix B</a> .	
Explanation and justification for any FxCop errors. See <a href="#">Requirement 1.1</a> .	
List of all vendor or third-party assemblies. See <a href="#">Requirement 1.2</a> and <a href="#">Requirement 1.8</a> .	
Partner-facing implementation guide that is appropriate for value-added resellers (VAR) or other people who intend to deploy your solution. See <a href="#">Requirement 2.3</a> .	
Explanation of any functionality that restricts the functionality of Microsoft Dynamics NAV. See <a href="#">Requirement 3.2</a> .	
List of countries/regions that your solution supports. See <a href="#">Requirement 4.1</a> .	
Description of all registry settings that are generated during installation. See <a href="#">Requirement 6.2</a> .	
List of all components, including external components that your application uses. For COM components, you must specify if they should be run on the RoleTailored client, on Microsoft Dynamics NAV Server, or both. For Automation components that run on Microsoft Dynamics NAV Server, you must provide the main user scenarios. See <a href="#">Requirement 1.7</a> , <a href="#">Requirement 6.3</a> , and <a href="#">Requirement 6.4</a> .	
List of application objects submitted for test in a Microsoft Office Excel <sup>®</sup> workbook. See <a href="#">Requirement 0.1</a> ,	

<p>List of available Web services. For each Web service, you must provide the following information:</p> <ul style="list-style-type: none"> <li>• IDs of the objects (pages and codeunits) that are exposed as Web services.</li> <li>• Name of each object on the <b>Web Service</b> table (table 200000076).</li> <li>• If your Web service runs in an External Connector licensing scenario, information about why this is a valid External Connector scenario.</li> </ul> <p>See <a href="#">Requirement 0.1</a> and <a href="#">Requirement 1.6</a></p>	
List of all services that are used by the ISV solution to access Microsoft Dynamics NAV data, such as SQL Server <sup>®</sup> Analysis Services.	
Description of which Microsoft Dynamics NAV license is required for solution installation. See <a href="#">Requirement 6.7</a> .	
List of all resources that your solution adds to Microsoft Dynamics NAV and complete instructions for uninstalling your solution. If you cannot uninstall your solution, then you must state this in the installation instructions documentation. See <a href="#">Requirement 6.8</a> .	
Sample data for testing. This does not need to be part of the core solution installation. See <a href="#">Requirement 6.9</a> .	
List of company types that your solution adds or modifies. See <a href="#">Requirement 6.11</a> .	
RIM usage questionnaires in <a href="#">Appendix D</a> . See <a href="#">Requirement 6.11</a> .	
Description of backup and restore procedures. See <a href="#">Requirement 7.1</a> .	
Customization and extensibility guide, which is commonly known as a developer's guide that explains how to extend your solution. See <a href="#">Requirement 2.3</a> .	
Databases upgrade scripts and documentation. See <a href="#">Requirement 8.1</a> .	

## **ISV SOFTWARE SOLUTION REQUIREMENTS AND RECOMMENDATIONS**

The Microsoft Dynamics NAV ISV Software Solution Test Guidelines help ensure that ISV solutions integrate with Microsoft Dynamics NAV without causing problems or errors. Microsoft and third-party test vendors worked together to define the minimum requirements that an ISV solution must meet to operate successfully with Microsoft Dynamics NAV.

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**Note** The test does not validate the correctness or relevance of ISV solution functionality.

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This section describes the test requirements and recommendations and the procedures for verifying that each requirement is met. In this document, the word *must* in the text of a requirement means that

the item or feature is required. The word *should* means that the item or feature is recommended and its inclusion is a best practice, but it is not strictly required. These recommendations may be considered for inclusion as requirements in later versions of this test.

Some requirements are technology specific and do not apply to all ISV solutions. Therefore, each requirement indicates the type of ISV technology to which it applies. Additionally, an ISV solution may include several technologies. In these situations, the vendor will test those parts of the solution that use the technologies to which the requirement or recommendation applies.

Technology	Applicable to
<b>C/SIDE</b>	<ul style="list-style-type: none"> <li>Any code that is written in C/AL (either business logic or code that implements an integration to an external component), if the vendor in-lab test is performed directly on the code.</li> <li>Any solution that includes C/AL code, if the vendor in-lab test is not performed directly on the code.</li> </ul>
<b>External</b>	<ul style="list-style-type: none"> <li>Any code not written in C/AL (including DLLs, ActiveX controls, services, and applications that have their own user interface), if the vendor in-lab test is performed directly on the code.</li> <li>Any solution that includes such code, if the vendor in-lab test is not performed directly on the code.</li> </ul>
<b>WSExposed</b>	Pages or codeunits that are designed to be exposed as Web services, if the vendor in-lab test is performed directly on the code.
<b>WSCalling</b>	Any code that is not written in C/AL and calls Web services in Microsoft Dynamics NAV, if the vendor in-lab test is performed directly on the code.
<b>All</b>	All code

## SUITABILITY REQUIREMENTS

Your solution must meet the following suitability requirement before any other test is performed.

- [Requirement 0.1: Application objects that are submitted for testing must be listed in an Excel workbook.](#)

### 0.1 Application objects that are submitted for testing must be listed in an Excel workbook.

Type	Test method	Technology	Solution category		
Required	In-lab review	C/SIDE	Simple	Complex	Hosted
			✓	✓	✓

#### SUMMARY AND INTENT

When an ISV solution is submitted for testing, it will contain a number of application objects that must be listed by the ISV. If the ISV solution implements any Web services, then when the solution is submitted for testing, it will also contain a number of application objects (pages and codeunits) that are exposed as Web services. To provide customers and potential reselling partners with an overview of which objects have been tested, this list will be attached to the final certification report and made available in Solution Finder.

#### RESOURCES

None

#### HOW TO COMPLY

Provide a list of application objects in an Excel workbook. Copy the required fields of all application objects submitted for testing from the object designer into an Excel workbook. The Excel workbook must contain the following columns in the following order: Object ID, Object Name, and Object Type. Additionally, add a WSEExposed column indicating whether the object is exposed as a Web service. If the object is exposed as a Web service, then mark it as TRUE. Otherwise, mark it as FALSE.

#### TEST METHODOLOGY

To verify this requirement, the test vendor will follow these steps:

For object verification:

1. Open Object Designer, and then click the **All Objects** button.
2. When all objects are displayed, select all Microsoft Dynamics NAV objects that were modified by the ISV.
3. Copy the names of these objects to an Excel workbook.
4. Compare this file with the Excel workbook that was received from the ISV.
5. Note any discrepancies.

For Web services verification:

1. Identify the pages and codeunits that are designed to be exposed as Web services. After the ISV solution has been deployed, pages and codeunits that are exposed as Web services are displayed on the **Web Service** table (table 200000076).
2. Compare the contents of the **Web Service** table with the Excel workbook that was received from the ISV.
3. Note any discrepancies.

#### CRITERIA FOR PASSING

This requirement is mandatory. If the solution contains objects or Web services that are not included in the list that is provided by the ISV, then it will fail the test.

## DEVELOPMENT REQUIREMENTS

Your solution must meet the following requirements:

- [Requirement 1.1: The ISV solution with managed code must be compiled with at least the .NET Framework 2.0 and must pass the required FxCop tests.](#)
- [Requirement 1.2: Managed assemblies must be strongly named.](#)
- [Requirement 1.3: New application objects must use their assigned number range.](#)
- [Requirement 1.4: The ISV solution must follow standard Microsoft Dynamics NAV version conventions and provide code comments for changed Microsoft Dynamics NAV objects.](#)
- [Requirement 1.5: Web service URLs must be configurable.](#)
- [Requirement 1.6: Pages and codeunits that are designed to be exposed as Web services must not generate any UI that would cause an exception in the calling code.](#)
- [Requirement 1.7: Automation objects that run on Microsoft Dynamics NAV Server must not generate any UI.](#)
- [Requirement 1.8: ActiveX controls must be digitally signed.](#)
- [Requirement 1.9: The ISV solution must make its version information available.](#)
- [Requirement 1.10: The ISV solution must perform all data access through the Microsoft Dynamics NAV business logic.](#)

### 1.1 The ISV solution with managed code must be compiled with at least the .NET Framework 2.0 and must pass the required FxCop tests.

Type	Test method	Technology	Solution category		
<b>Required</b>	In-lab test	External	Simple	Complex	Hosted
		Managed code	✓	✓	✓

#### SUMMARY AND INTENT

ISV applications that use code from the Microsoft .NET Framework must use at least the .NET Framework 2.0 and must pass required Microsoft FxCop tests. FxCop is a code analysis tool that

checks .NET assemblies for conformance to .NET Framework design guidelines. We recommend using the .NET Framework 3.5 SP1 when creating your solution.

## RESOURCES

For more information, see the [.NET Framework Web site](#) and the [FxCop Web site](#).

## HOW TO COMPLY

You can download the .NET Framework and FxCop from the links in the Resources section. FxCop uses reflection, Microsoft intermediate language (MSIL) parsing, and call graph analysis to inspect assemblies for more than 200 defects.

FxCop includes the following rule libraries, which are based on .NET Framework design guidelines that are loaded by default when a new project is created:

- **COM:** Rules that detect COM interoperability issues.
- **Design:** Rules that detect potential design flaws. These coding errors typically do not impact the execution of your code.
- **Globalization:** Rules that detect missing or incorrect usage of information that is related to globalization and localization.
- **Naming:** Rules that detect incorrect casing, cross-language keyword collisions, and other issues that are related to the names of types, members, parameters, namespaces, and assemblies.
- **Performance:** Rules that detect elements in your assemblies that will degrade performance.
- **Security:** Rules that detect programming elements that leave your assemblies vulnerable to malicious users or code.
- **Usage:** Rules that detect potential flaws that can impact code execution in your assemblies.

Issues are assigned one of five importance levels:

- **Critical error:** Issues that are highly visible or that prevent code from operating correctly in common scenarios. You should resolve critical error messages first. You should exclude these only after carefully assessing the impact of ignoring the error.
- **Error:** Issues that have less impact on usability and behavior than critical errors. You should not exclude these errors without careful analysis.
- **Critical warning:** Issues that typically have little or no negative impact on code behavior. These messages may indicate issues with code maintainability and suboptimal choices for visible elements. However, these messages should be considered errors, and you should review them closely before you exclude them.
- **Warning:** Issues that are typically concerned with doing things correctly to keep your code base stable, extensible, and maintainable.
- **Informational:** Messages that are returned by rules that report information about a system rather than detecting issues in a system.

To pass this requirement, you must act on all critical errors for all issues and on errors for security issues. It is a good practice to act on all issue types of all importance levels. For example, you can

suppress an error by explaining the reason for violating the rule and why it is not a valid issue. You can suppress a violation either in source or in an FxCop project file. For more information about in-source suppressions, see [In-Source Suppression Overview](#). You must provide information about in-source suppressions. If suppressions are done in an FxCop project file, then you must also provide this project file to the test vendor.

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**Note** Suppressing an error and explaining the reason for the violation does not guarantee that a waiver will be granted by the vendor or Microsoft.

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#### TEST METHODOLOGY

The test vendor will use FxCop to analyze the ISV solution. If FxCop reports any critical errors or any security errors, then the ISV must provide a written explanation and justification in the tool or in a separate document.

#### CRITERIA FOR PASSING

This requirement is mandatory. If the ISV solution does not pass this requirement, then it will fail the test.

#### 1.2 Managed assemblies must be strongly named.

Type	Test method	Technology	Solution category		
Required	In-lab review	External	Simple	Complex	Hosted
		Managed code	✓	✓	✓

#### SUMMARY AND INTENT

This requirement is included for security purposes. You can ensure that a name is globally unique by signing an assembly with a strong name. In particular, strong names satisfy the following requirements:

- Guarantees name uniqueness by relying on unique key pairs.
- Protects the version lineage of an assembly.
- Provides a strong integrity check.

#### RESOURCES

For more information about the Strong Name tool, see [Strong Name Tool \(Sn.exe\)](#).

The Sn.exe tool is provided as part of the Windows SDK, which you can download from the [Windows SDK for Windows Server 2008 and .NET Framework 3.5](#) page.

The Sn.exe tool that is provided with Microsoft Visual Studio and with the .NET Framework 3.5 supports the proper use of strong names.

#### HOW TO COMPLY

You must use strong naming for managed assemblies. If your solution uses a vendor or third-party assembly, then the assembly must also be signed. You must provide a list of vendor or third-party assemblies.

### TEST METHODOLOGY

The test vendor will use the list of assemblies that are provided as a documentation requirement and use the Sn.exe tool that is provided with Visual Studio to verify the proper use of strong names.

### CRITERIA FOR PASSING

This requirement is mandatory. If the solution does not use strong naming for managed assemblies, then it will fail the test.

#### 1.3 New application objects must use their assigned number range.

Type	Test method	Technology	Solution category		
Required	In-lab review	C/SIDE	Simple	Complex	Hosted
			✓	✓	✓

### SUMMARY AND INTENT

When an ISV solution is registered, Microsoft Dynamics Sales Operations will assign a specific range of object numbers for that solution to use. All new objects that are installed by the solution must use this number range.

### RESOURCES

See the Microsoft Dynamics Sales Operations document, which is provided to you by your Regional Operations Center when registering your add-on with Microsoft, to obtain a number range for objects in your solution.

The number range is assigned as part of the registration process of your add-on solution as described in your Add-on Addendum and on PartnerSource. For more information, see [Microsoft Dynamics NAV Add-On Registration](#) (requires PartnerSource login).

### TEST METHODOLOGY

The test vendor will obtain the registered object number range for the solution and verify that all new objects are in this number range.

### CRITERIA FOR PASSING

This requirement is mandatory. If the solution adds objects that are outside of the assigned object number range, then it will fail the test unless the solution includes objects that are provided by other ISVs and are declared as part of the solution under test. Other exceptions may apply to this requirement if the ISV provides a valid reason for it.

#### 1.4 The ISV solution must follow standard Microsoft Dynamics NAV version conventions and provide code comments for changed Microsoft Dynamics NAV objects.

Type	Test method	Technology	Solution category		
Required	In-lab review	All	Simple	Complex	Hosted
			✓	✓	✓

### *SUMMARY AND INTENT*

Your solution must follow standard Microsoft Dynamics NAV versioning conventions. In your version list of new and customized objects, names and version numbers must be consistent. In addition, if you have modified any Microsoft Dynamics NAV objects, then you must insert code comments that identify the changes and list the changes and corresponding version numbers on your version list.

All unmodified objects from Microsoft Dynamics NAV must be from the latest version of Microsoft Dynamics NAV with the latest service pack, and all modified Microsoft Dynamics NAV objects must be based on the latest version of the Microsoft Dynamics NAV objects.

### *RESOURCES*

See [Appendix C](#).

### *HOW TO COMPLY*

Ensure that version information for your solution follows the Microsoft Dynamics NAV conventions and that you have clearly identified any modified Microsoft Dynamics NAV objects. You must also ensure that all modifications to Microsoft Dynamics NAV objects are migrated to the latest version of Microsoft Dynamics NAV objects. Within modified objects, you must clearly delimit your code from the standard Microsoft Dynamics NAV code. You can use comments to indicate where your modifications begin and where they end. You should also comment your code's functionality.

### *TEST METHODOLOGY*

To verify this requirement, the test vendor will follow these steps:

1. Check that the version list of new and customized objects is consistent. If standard Microsoft Dynamics NAV objects have been modified, then you must mark the modifications with a code and version number. The **Modify** flag for the specified object must not be set to **Yes**.
2. Check the version information of the modified objects so that the version information contains both a Microsoft Dynamics NAV version number and an ISV version number. The Microsoft Dynamics NAV version number must be identical to the version number of that object in the latest version of Microsoft Dynamics NAV with the latest service pack installed.
3. Check the version information of the unmodified objects, where the version information contains only the Microsoft Dynamics NAV version. The version number, date and time, and BLOB size must be identical to the same information in the latest version of Microsoft Dynamics NAV with the latest service pack installed.
4. Select multiple standard application objects that the ISV has modified and compare the code with the standard version of the object. Check that the ISV has commented all code changes to identify the changes.

### *CRITERIA FOR PASSING*

This requirement is mandatory. If the solution does not follow Microsoft Dynamics NAV version conventions or if comments for code changes to Microsoft Dynamics NAV objects are missing, then it will fail the test. If the solution is not based on the latest version of standard Microsoft Dynamics NAV objects, then it will fail the test.

## 1.5 Web service URLs must be configurable.

Type	Test method	Technology	Solution category		
Required	In-lab review	All	Simple	Complex	Hosted
			✓	✓	✓

### *SUMMARY AND INTENT*

A Web service solution must not be tied to a particular network configuration. The URL of the hosting machine can change, additional hosts can be added, or proxies or load balancers can be introduced. Editing or recompiling source code to perform these types of changes is counterproductive because it ties a customer to the owner of the source code and makes it harder to deploy the solution to multiple locations and install for multiple customers.

### *RESOURCES*

The current standard for the .NET Framework is to store configuration elements in a solution app.config file. For more information, see [How to: Add Application Configuration Files to C# Projects](#).

### *HOW TO COMPLY*

Ensure that a deployed solution can be made to point to multiple Web services without having to edit source code, recompile source code, or run proprietary software to change the configuration. We recommend that you follow existing practices, such as configuration files or registry entries, for configurable elements.

### *TEST METHODOLOGY*

To verify this requirement, the test vendor will follow these steps:

1. Identify the method of URL configuration, which must be described in the installation and configuration guide as described in [Requirement 2.2](#). Note that the URL or URLs do not need to be configured as a single entity in the registry or configuration files. Different parts of the URL, such as the host or port, can be configured separately, and the URL can be constructed at run time. The following URL parts must be configurable and cannot be hardcoded:
  - Host
  - Port
  - Microsoft Dynamics NAV service instance
  - Company name
2. Verify that the solution can be configured as described in the installation and configuration guide. This may involve looking for registry entries or configuration file entries and checking that changes to those places are reflected in the solution's behavior, Restarting the ISV solution may be required.
3. Verify the following scenarios:
  - The solution works with at least two different Microsoft Dynamics NAV hosts.

- The solution works with at least two different Microsoft Dynamics NAV port configurations. You can configure this in the CustomSettings.config file for the Microsoft Dynamics NAV service.
- The solution works with at least two different Microsoft Dynamics NAV service instance configurations. You can configure this in the CustomSettings.config file on the computer running Microsoft Dynamics NAV Server.
- The solution works with at least two different company names. A company can be renamed with the Classic client.

#### CRITERIA FOR PASSING

This requirement is mandatory. If a solution does not allow the Web service URL to be changed without recompiling or editing the source code, then it will fail the test.

#### 1.6 Pages and codeunits that are designed to be exposed as Web services must not generate any UI that would cause an exception in the calling code.

Type	Test method	Technology	Solution category		
Required	In-lab review	WSEExposed	Simple	Complex	Hosted
			✓	✓	✓

#### SUMMARY AND INTENT

When writing code for Web services, you must not use end-user confirmation dialog boxes, message boxes, or any other form or page constructs in the code. Because a Web service runs independently of a user interface, running this type of code causes the code to throw an exception. The exception can be caught and handled, but the Web service will not complete.

#### RESOURCES

For more information, see [Working with Web Services](#) in the *Microsoft Dynamics NAV 2009 Developer and IT Pro Documentation* at.

#### HOW TO COMPLY

Ensure that code for pages and codeunits that is designed to be exposed as Web services do not use any end-user confirmation dialog boxes or message boxes.

#### TEST METHODOLOGY

To verify this requirement, the test vendor will follow these steps:

1. Identify the pages and codeunits that are designed to be exposed as Web services. After the ISV solution has been deployed, pages and codeunits that are exposed as Web services are displayed on the **Web Service** table (table 200000076).
2. If direct code inspection is feasible, depending on the complexity of the pages and codeunits and the objects that they call, then the functions from the following table should not be used without conditional code that is based on GUIALLOWED=FALSE or CurrFieldNo=0 circumventing their call. These conditions indicate usage from Web services.

C/AL function	Applies to
CONFIRM	Codeunit/page
STRMENU	Codeunit/page
(Form RunModal)	Page
Page of type Confirmation Dialog	Page
(Request form)	Page
ERROR	Codeunit/page
BEEP	Codeunit/page
YIELD	Codeunit/page

Additionally, when running the page or codeunit as a Web service, the following exception should never occur:

**Microsoft.Dynamics.Nav.Types.Exceptions.NavNCLCallbackNotAllowedException:  
Callback functions are not allowed.**

#### CRITERIA FOR PASSING

This requirement is mandatory. If the solution uses end-user confirmation dialogs or message boxes in the code that is exposed to a Web service, then it will fail the test.

#### 1.7 Automation objects that run on Microsoft Dynamics NAV Server must not generate any UI.

Type	Test method	Technology	Solution category		
<b>Required</b>	In-lab review	External	Simple	Complex	Hosted
			✓	✓	✓

#### SUMMARY AND INTENT

All Automation objects that allow a user interface to be generated cannot be used on Microsoft Dynamics NAV Server. Because Microsoft Dynamics NAV Server runs as a service, it is running in the security context of the built-in Network Service account. This service account has limited permissions for Automation objects. The default settings for this account prevent it from starting new processes, such as any COM out-of-process object. Processes need a specific command for closing them. If this command is not called, then the process will stay active until the computer is shut down or restarted.

#### RESOURCES

For more information, see [Extending C/AL](#) in the *Microsoft Dynamics NAV 2009 Developer and IT Pro Documentation*.

#### HOW TO COMPLY

Ensure that only in-process Automation objects with no user interface are run on Microsoft Dynamics NAV Server.

## TEST METHODOLOGY

Execute the scenarios that are provided with the documentation with Automation components that run on Microsoft Dynamics NAV Server and verify that Microsoft Dynamics NAV Server does not throw errors, stop responding, or exit unexpectedly. For more information, see [Appendix B](#).

## CRITERIA FOR PASSING

This requirement is mandatory. If the solution runs user interface Automation components on Microsoft Dynamics NAV Server, then it will fail the test.

### 1.8 ActiveX controls must be digitally signed.

Type	Test method	Technology	Solution category		
Required	In-lab review	External	Simple	Complex	Hosted
			✓	✓	✓

## SUMMARY AND INTENT

This requirement is included for security purposes. Digital signing helps users decide if they want to trust a control and helps reassure users that files have not been tampered with.

## RESOURCES

Code-signing certificates are available from several vendors. For more information, see [Microsoft Root Certificate Program Members](#).

The Windows SDK SignTool tool is available on MSDN. For more information, see [Sign Tool](#).

## HOW TO COMPLY

After you obtain a code-signing certificate, you must use the SignTool tool to sign your files. If your solution uses a vendor or third-party assembly or ActiveX control, then the control must also be signed. You must provide a list of vendor or third-party controls.

## TEST METHODOLOGY

The test vendor will use the list of third-party controls provided as a documentation requirement and use SignTool to verify the proper use of signatures.

During testing, the test vendor will note any warnings about ActiveX controls that do not have valid certificates.

## CRITERIA FOR PASSING

This requirement is mandatory. If the solution does not comply with this requirement, then it will fail the test.

### 1.9 The ISV solution must make its version information available.

Type	Test method	Technology	Solution category		
Required	In-lab review	All	Simple	Complex	Hosted
			✓	✓	✓

#### SUMMARY AND INTENT

For support purposes, a user must be able to identify the version of your solution from the user interface. For example, you could include this information in an **About** dialog box.

#### RESOURCES

None

#### HOW TO COMPLY

Ensure that version information for your application is available to the user.

#### TEST METHODOLOGY

The test vendor will verify that version information is available to the user.

#### CRITERIA FOR PASSING

This requirement is mandatory. If the solution does not comply with this requirement, then it will fail the test.

---

**Note** This requirement does not apply to user interfaces that are designed for special devices, such as handheld devices or cash registers.

---

### 1.10 The ISV solution must perform all data access through Microsoft Dynamics NAV business logic.

Type	Test method	Technology	Solution category		
Required	None	All	Simple	Complex	Hosted
			✓	✓	✓

#### SUMMARY AND INTENT

To ensure that the ISV solutions maintain data consistency, comply with the Microsoft Dynamics NAV security model, and do not reduce the security level that is present for Microsoft Dynamics NAV, all access to data must be performed through Microsoft Dynamics NAV business logic.

#### RESOURCES

For information about the Microsoft Dynamics NAV security model, see [Creating a More Secure Application](#) in the *Microsoft Dynamics NAV 2009 Developer and IT Pro Documentation*.

For information on how to help securely set up Microsoft Dynamics NAV 2009, see the *Security Hardening Guide*, which is available on the product media.

For information on setting up a Windows service account, see [Setting Up Windows Service Accounts](#).

#### HOW TO COMPLY

Ensure the following:

- All services that are used to access Microsoft Dynamics NAV must be run on a least-privileged account (non-*sysadmin*) account.

- All external components must run with least privilege.
- Only business logic is used to perform the access to data.
- Provide non-SUPER roles for testing your solution.

#### *TEST METHODOLOGY*

The test vendor will:

1. Install the ISV solution on at least a two-computer (server-client) setup.
2. Ensure that the Microsoft Dynamics NAV security system is activated by creating at least one user. In the Classic client, on the **Tools** menu, click **Security**, and then click **Windows Logins**.
3. Open the Windows Services panel on the computer running Microsoft Dynamics NAV Server and ensure that the service tier is running with the least-possible privileges
4. Open the RoleTailored client as an existing Microsoft Dynamics NAV user who:
  - Is not assigned to the SUPER role. Use the non-SUPER role provided by the ISV.
  - Is not an administrator on the client computer.
  - Is not *sysadmin* or owner of the Microsoft Dynamics NAV database.
5. Execute the scenarios that are provided with the documentation (see [Appendix B](#)).

During the execution of the scenarios, the test vendor will verify that all services that are accessing the Microsoft Dynamics NAV system as provided by the ISV in the documentation requirements are running on a least-privileged account and note any discrepancies.

#### *CRITERIA FOR PASSING*

This requirement is mandatory. If the ISV solution does not pass this requirement, then it will fail the test.

### USER ASSISTANCE AND PRODUCT DOCUMENTATION REQUIREMENTS AND RECOMMENDATIONS

Your solution must comply with the following requirements and should comply with the following recommendation:

- [Requirement 2.1: The ISV solution must include Help that is targeted to the solution user.](#)
- [Requirement 2.2: The ISV must provide an installation and configuration guide.](#)
- [Requirement 2.3: The ISV must provide documentation for VARs.](#)
- [Recommendation 2.4: ISV solution Help should follow the style guidelines that are described in the Microsoft Dynamics NAV Help Guide.](#)

## 2.1 The ISV solution must include Help that is targeted to the solution user.

Type	Test method	Technology	Solution category		
			Simple	Complex	Hosted
Required	In-lab review	All	✓	✓	✓

### SUMMARY AND INTENT

You must provide Help documentation that targets the RoleTailored client for your solution. If necessary, also provide Help for administrative tasks that can only be done in the Classic Client. This content should be added to the Classic client Help. Customizing Help to match your customizations helps increase customer satisfaction with your solution and reduces your support costs.

---

**Note** This requirement does not apply to functionality that runs on the desktop or a device that is not exposed within the Microsoft Dynamics NAV user interface, such as handheld devices, cash registers, or Web sites. In these scenarios, you should provide user documentation that is appropriate to the user interface.

---

### RESOURCES

To satisfy this requirement, you should use the tools and information that are provided in the [Help Toolkit](#) (requires PartnerSource login) and the [Microsoft Dynamics NAV 2009 Help source files](#) (requires PartnerSource login) to create your Help system.

The *Microsoft Dynamics NAV Help Guide*, which is included in the Help Toolkit, describes methods and guidelines for creating a Help project that integrates with the Microsoft Dynamics NAV Help system. It includes instructions on how to use the various tools, including Microsoft Dynamics NAV Help Builder, that are available in the Help Toolkit. The *Help Guide* provides information on how to update and customize the base documentation that Microsoft provides and includes instructions for directing F1 calls to your solution documentation. The *Help Guide* also provides guidance for migrating Help that was designed for the Classic client to Help that is designed for the RoleTailored client.

### HOW TO COMPLY

Documentation for a Microsoft Dynamics NAV solution must provide a user experience that is consistent with the base documentation. It must be easy for the user to access and to navigate. You must provide the following:

- Help to explain all added objects. All content that you provide must contain appropriate ownership and copyright information.
  - All new application objects must be documented. To meet the requirement, you can document an object at the form or page level or at the field level. If you provide documentation at the form or page level, then you must provide appropriate content for fields to meet user needs.
  - If you have customized objects that were provided by Microsoft, then you must document these changes. You can update the Help that Microsoft provides, or you can create new Help. For more information about requirements for addressing copyright issues, see [Microsoft Dynamics NAV 2009 Help Customization Best Practices and Requirements](#).

- Help to assist solution users understand how a feature works and is used.
- Index keywords that support user access and navigation to your content.
- F1 keywords on objects to support contextual Help.

Your documentation must be in compiled Help (.chm) format and must integrate with the Microsoft Dynamics NAV Help system. In an in-product solution, users must be able to see Help topics by pressing the F1 key, which opens the Microsoft Dynamics NAV Help window. Users must also be able to access Help topics by using the index, search, and the table of contents functionality that is provided by the .chm file format.

We recommend that you update the documentation feedback script to send documentation feedback e-mail messages to you. If you are creating new Help projects or editing projects that were provided by Microsoft, then you should maintain different versions of the Feedback.js file. For more information about the feedback mechanism and privacy concerns, see the *Help Guide*.

### TEST METHODOLOGY

The test vendor will review your Help documentation for compliance and usability.

For functionality that is exposed within the Microsoft Dynamics NAV user interface, the test vendor will review a representative sample of application modules to make sure that Help is available when a user presses F1 or when a user accesses search, the index, and the table of contents. The test vendor will verify that the Help follows the navigation structure of the core Microsoft Dynamics NAV Help system.

For functionality that is not exposed within the Microsoft Dynamics NAV user interface, the test vendor will review your documentation to verify that you have included adequate Help information.

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**Note** The test vendor will only validate that the required information is included. The vendor will not verify the quality or technical accuracy of the information.

---

### CRITERIA FOR PASSING

This requirement is mandatory. If the solution does not provide Help documentation, then it will fail the test.

## 2.2 The ISV must provide an installation and configuration guide.

Type	Test method	Technology	Solution category		
			Simple	Complex	Hosted
<b>Required</b>	In-lab review	All	✓	✓	✓

### SUMMARY AND INTENT

You must include an installation and configuration guide in your documentation. If you do not use partners to sell your solution, then you must provide installation and configuration information to customers. If your solution is implemented only by your employees or is hosted by you, then an internal document explaining how your product should be implemented must be provided to the test vendor.

ISV partners and customers who use or deploy a solution must be able to successfully deploy, configure, and manage the solution in an existing Microsoft Dynamics NAV environment. Your

documentation must provide information that allows partners and customers to successfully install or upgrade your solution in this environment.

#### RESOURCES

See the *Microsoft Dynamics NAV 2009 Installation and Configuration Guide* and the *Security Hardening Guide* on the product media when creating your solution-specific guide.

#### HOW TO COMPLY

Include adequate system requirements, installation, configuration, and upgrade documentation to allow your employees, a partner, or a customer to implement your solution in a new or existing Microsoft Dynamics NAV environment. This can take the form of one document, or you can also refer to separate documents for additional information.

A compliant guide will contain the following sections:

- Description of the solution, which describes the problem that the solution solves.
- Hardware and operating system requirements.
- Installation and configuration tasks and walkthroughs.
- Operational checklist, which includes information about performing daily, monthly, and annual procedures; performing backups; and other related tasks.
- Security hardening information, which describes how the solution is deployed in a more secure manner.

#### TEST METHODOLOGY

The test vendor will review your documentation to verify that you have included adequate implementation information.

---

**Note** The test vendor will only validate that the required information is included. The vendor will not verify the quality or technical accuracy of the information.

---

#### CRITERIA FOR PASSING

This requirement is mandatory. If the solution documentation does not include an installation and configuration guide, then it will fail the test.

#### 2.3 The ISV must provide documentation for VARs.

Type	Test method	Technology	Solution category		
			Simple	Complex	Hosted
Required	In-lab review	All	✓	✓	✓

#### SUMMARY AND INTENT

Customers and VARs frequently customize and extend business software. Therefore, you must provide documentation that explains your solution and how to customize it. You must provide documentation that thoroughly describes your solution, how it works, and how it can be customized. The documentation provides a more technical explanation of the solution than the documentation that

targets the solution user. Its purpose is to give value-added resellers (VAR) a solid understanding of the solution to help them customize and sell the solution to customers.

### *RESOURCES*

See the Microsoft Dynamics NAV 2009 Developer and IT Pro Documentation when creating your solution-specific documentation. In addition, to satisfy this requirement, you should use the tools and information that are provided in the [Help Toolkit](#) (requires PartnerSource login) and the [Microsoft Dynamics NAV 2009 Help source files](#) (requires PartnerSource login) to integrate with the Microsoft Dynamics NAV Help system.

### *HOW TO COMPLY*

Document your customization and extensibility procedures in a developer's guide. You should provide an overview that explains the customization and extensibility strategy and detailed information about each API, Web service, and other components that your solution exposes.

The documentation can be in the form of a separate Microsoft Office Word or .pdf document or as a reference section in the Microsoft Dynamics NAV Help system.

A compliant guide should contain the following sections:

- An overall description of the solution and the business problem that it solves. Include the target audience for the solution and usage scenarios.
- An explanation of the data model for the solution, including:
  - A description of new and modified tables, including fields and stored data types.
  - Relationship between tables and fields. Provide entity-relationship (ER) diagrams where appropriate.
  - New and modified functionality and its interaction. Provide interaction diagrams where appropriate.
- A description of new and modified forms, pages, reports, XMLports, codeunits, RoleTailored client control add-ins, and other objects that are used to gather, process, and display data from the tables.
  - Include data flow diagrams where appropriate.
  - Describe the C/AL code that connects the application objects. This can be in the form of reference topics for each codeunit or comments in the C/AL Code Designer
  - For RoleTailored client control add-ins, describe the purpose and the underlying code. This can be in the form of reference topics or comments in the source code
- A description of how the VAR can customize the solution. You should provide an overview that explains the customization and extensibility strategy and detailed information about each API, Web service, and other components that your solution exposes. Include conceptual information and procedures

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**Note** Installation and configuration information must be included in the installation and configuration guide. For more information, see [Requirement 2.2](#).

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## TEST METHODOLOGY

The test vendor will review your documentation to verify that you have included adequate implementation information.

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**Note** The test vendor will only validate that the required information is included. The vendor will not verify the quality or technical accuracy of the information.

---

## CRITERIA FOR PASSING

This requirement is mandatory. If the ISV solution does not pass this requirement, then it will fail the test.

### 2.4 ISV solution Help should follow the style guidelines that are described in the Microsoft Dynamics NAV Help Guide.

Type	Test method	Technology	Solution category		
			Simple	Complex	Hosted
Recommended	In-lab review	All	✓	✓	✓

## SUMMARY AND INTENT

The documentation for your solution should follow Microsoft Dynamics NAV Help style guidelines. It should tell the user how to perform specific tasks, and it should be easy for the user to understand. Documentation for a Microsoft Dynamics NAV–certified ISV solution should provide a user experience that is consistent, in writing style and depth of information, with the documentation that is provided with Microsoft Dynamics NAV.

To improve customer experience for Microsoft Dynamics NAV 2009, Microsoft has created a number of application walkthroughs, overview topics, and task-oriented topics as part of the help contents. You should customize these topics to match your solution and add additional walkthroughs, overview topics, and task-oriented documentation that explain how users should use your solution to accomplish their business goals.

## RESOURCES

The *Microsoft Dynamics NAV Help Guide* is available in the [Help Toolkit](#) (requires PartnerSource login). The [Microsoft Manual of Style for Technical Publications](#) contains the standards and best practices that Microsoft uses in creating documentation.

To satisfy this requirement, you should use the tools and information that is provided in the [Help Toolkit](#) (requires PartnerSource login) and the [Microsoft Dynamics NAV 2009 Help source files](#) (requires PartnerSource login) to create your Help system.

## HOW TO COMPLY

Ensure that you have Help that provides meaningful information. The guidelines in the *Microsoft Dynamics NAV Help Guide* help you create appropriate content.

---

### *TEST METHODOLOGY*

The test vendor will review your Help documentation for style, accuracy, and usability. The vendor will review a representative sample of application modules to ensure that Help topics are appropriate, easy to understand, correct, and adhere to style and user interface guidelines.

### *CRITERIA FOR PASSING*

This is a recommendation only. Failure to comply with this recommendation will not cause the solution to automatically fail the test.

## USER EXPERIENCE REQUIREMENTS

Your solution must comply with the following requirements:

- [Requirement 3.1: The ISV solution must comply with core Windows and Microsoft Dynamics NAV 2009 user experience guidelines.](#)
- [Requirement 3.2: The ISV solution that restricts the functionality of Microsoft Dynamics NAV must document the restriction.](#)

### 3.1 The ISV solution must comply with core Windows and Microsoft Dynamics NAV 2009 user experience guidelines.

Type	Test method	Technology	Solution category		
Required	In-lab review	C/SIDE	Simple	Complex	Hosted
			✓	✓	✓

#### SUMMARY AND INTENT

User experience requirements are part of the test requirements review.

Users of your solution must have a user experience that is consistent with Microsoft Dynamics NAV. Therefore, the user interface for your application must demonstrate correct aesthetics and consistency and must comply with both Windows® and Microsoft Dynamics NAV 2009 user experience guidelines.

---

**Note:** This requirement does not apply to user interfaces that are designed for special devices, such as handheld devices or cash registers. Additionally, there may be other justifications for deviating from the standard user experience guidelines. You must include these justifications with the application when you submit it for testing. The justifications will be evaluated during the test process.

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#### RESOURCES

For more information, see [Appendix A](#).

#### HOW TO COMPLY

Follow the user experience requirements from [Appendix A](#). If your user experience deviates from these requirements, then you must prepare a justification for the deviation. Include this justification in your software submission package.

#### TEST METHODOLOGY

To verify this requirement, the test vendor will open a random selection of windows that are added by your solution and confirm that each one follows the Microsoft Dynamics NAV 2009 user experience requirements.

#### CRITERIA FOR PASSING

This requirement is mandatory. If the solution does not follow user experience requirements, then it will fail the test.

### 3.2 The ISV solution that restricts the functionality of Microsoft Dynamics NAV must document the restriction.

Type	Test method	Technology	Solution category		
Required	In-lab review	All	Simple	Complex	Hosted
			✓	✓	✓

#### *SUMMARY AND INTENT*

End users expect that the underlying Microsoft Dynamics NAV solution is fully functional. In addition, other ISVs will expect that a Microsoft Dynamics NAV environment will be fully functional.

#### *RESOURCES*

None

#### *HOW TO COMPLY*

If your solution limits or breaks existing Microsoft Dynamics NAV 2009 functionality or cannot coexist with Microsoft Dynamics NAV 2009 functionality, then you must include documentation that explains the conflict and states that the Microsoft Dynamics NAV feature or function will not be available after the user installs your solution. For example, if a reporting solution is designed for customers who do not use inventory and will not work for a customer who uses standard inventory functionality, then you must explain this limitation.

#### *TEST METHODOLOGY*

The test vendor will confirm that you have provided the required documentation.

#### *CRITERIA FOR PASSING*

This requirement is mandatory. If the solution limits or breaks existing Microsoft Dynamics NAV 2009 functionality and does not document the limitation, then it will fail the test.

### TRANSLATION AND LOCALIZATION REQUIREMENT

Your solution must comply with the following requirement:

- [Requirement 4.1: The ISV solution must separate strings from source code.](#)

#### 4.1 The ISV solution must separate strings from source code.

Type	Test method	Technology	Solution category		
Required	In-lab review	All	Simple	Complex	Hosted
			✓	✓	✓

#### *SUMMARY AND INTENT*

ISV solutions must be able to be localized in the same markets that the underlying Microsoft Dynamics NAV product serves. Therefore, your solution must be globalized and follow localization best practices.

## RESOURCES

For more information, see the following Web sites:

- [Microsoft Global Development and Computing Portal](#)
- [MSDN Developer Center: Visual Studio Globalization](#)

## HOW TO COMPLY

Microsoft Dynamics NAV includes multilanguage features. Therefore, a Microsoft Dynamics NAV user can switch languages within the application. To provide a consistent user experience, your solution must have multilanguage properties set on all captions and user interface fields. All text constants must be multilanguage enabled unless they refer to computer-to-computer communication, such as building XML documents or integrating with other applications.

Even if you are not localizing your application into other languages, you must consider how your application will operate with other language configurations. For example, if you use English (United States) names and locations for standard system directories, then your solution may not install or run correctly.

Your solution must be shipped with English language strings in addition to the target language or languages for your solution. If it is clearly documented in your sales and marketing materials that your solution only targets one language or country/region, then you may choose to ship it with language strings for that language only.

## TEST METHODOLOGY

To verify this requirement, the test vendor will follow these steps:

1. Install the language module for the targeted language.
2. Check that the forms and error messages run on the selected language. On the **Tools** menu, click **Language**. Select a language from the list.

## CRITERIA FOR PASSING

This requirement is mandatory unless it is clearly documented that your solution targets only one language or country/region. If the solution does not meet the multilanguage requirements, then it will fail the test.

## TECHNOLOGY CONFIGURATION AND PLATFORM REQUIREMENT

Your solution must meet the following requirement:

- [Requirement 5.1: The ISV solution must support the infrastructure that Microsoft Dynamics NAV supports.](#)

### 5.1 The ISV solution must support the infrastructure that Microsoft Dynamics NAV supports.

Type	Test method	Technology	Solution category		
Required	In-lab review	All	Simple	Complex	Hosted
			✓	✓	✓

### *SUMMARY AND INTENT*

Your solution must run on the specified infrastructure (browser, database, operating system, and other software) versions on which the latest version of Microsoft Dynamics NAV runs. Additionally, your solution must run on the latest service pack version of Microsoft Dynamics NAV if it has been available for the local version of Microsoft Dynamics NAV that is being tested for more than two months.

### *RESOURCES*

For more information, see

<https://mbs.microsoft.com/partnersource/newsevents/news/mdnav2009systemrequirements.htm>. This document lists the versions of various infrastructure components that are supported by Microsoft Dynamics NAV.

### *HOW TO COMPLY*

Test your solution on the infrastructure that Microsoft Dynamics NAV supports. In your user guide, include a system requirements section that identifies the supported operating system or systems, database, browser, and other environment requirements. Specify the required versions for all required infrastructure software. If your in-product solution will always run in Microsoft Dynamics NAV on whatever infrastructure Microsoft Dynamics NAV runs, then state this.

### *TEST METHODOLOGY*

The test vendor will perform a qualitative review to determine whether your solution runs on the specified infrastructure (browser, database, operating system, and other software). The vendor will review the user guide and compare the listed requirements to the latest list of supported components for Microsoft Dynamics NAV.

### *CRITERIA FOR PASSING*

This requirement is mandatory. If the solution does not run on the prescribed infrastructure, then it will fail the test.

## **INSTALLATION AND SETUP REQUIREMENTS AND RECOMMENDATIONS**

Your application must meet the following requirements:

- [Requirement 6.1: The ISV solution installation procedure must be compatible with Microsoft Dynamics NAV.](#)
- [Requirement 6.2: The ISV solution must correctly register DLLs and COM components.](#)
- [Requirement 6.3: The ISV solution must correctly deploy COM components to Microsoft Dynamics NAV Server and to client computers.](#)
- [Requirement 6.4: The ISV solution must correctly deploy add-in assemblies to the computer running SQL Server and to client computers.](#)
- [Requirement 6.5: After the ISV solution is installed, the Microsoft Dynamics NAV database must compile without errors.](#)
- [Requirement 6.6: The ISV must document the required versions and service packs of all dependent software programs, including Microsoft Dynamics NAV.](#)

- [Requirement 6.7: The ISV must document the Microsoft Dynamics NAV license that is required for their solution installation.](#)
- [Requirement 6.8: The ISV must document uninstallation procedures.](#)
- [Requirement 6.9: The ISV solution must include installable demonstration data.](#)
- [Requirement 6.10: Microsoft Dynamics NAV must start without errors after the ISV solution is installed.](#)
- [Requirement 6.11: The ISV solution must use the Rapid Implementation Methodology \(RIM\) to increase setup speed.](#)

#### 6.1 The ISV solution installation procedure must be compatible with Microsoft Dynamics NAV.

Type	Test method	Technology	Solution category		
<b>Required</b>	In-lab review	All	Simple	Complex	Hosted
			✓	✓	✓

#### *SUMMARY AND INTENT*

All ISV-certified solutions must have complete application installation instructions, and the instructions must be clear and easy to follow. The installation instructions must include procedures for installing and configuring Microsoft Dynamics NAV so that it functions with the ISV solution. You do not need to duplicate Microsoft Dynamics NAV installation procedures, but you may add to them by explaining any special steps that are required for your solution. The instructions can be in a plain text file or part of the standard user documentation. They must list all necessary steps, including working with the FOB import, system settings, and instructions for using any automated installation executables.

#### *RESOURCES*

None

#### *HOW TO COMPLY*

You must provide instructions for installing your solution. The installed components will be the components that will be tested.

Add-on solutions that are intended to be installed on top of other solutions must be shipped and installed with .fob files. Complete solutions that are not intended to be installed on top of another solution can be installed with .fob files or in another way, such as installing a custom database or restoring from database backup files.

You must provide detailed instructions on how to perform the installation. These should be written in a format that allows a VAR consultant to install the solution for a customer with minimal effort and without consulting technical support or contacting you.

---

**Note** This requirement does not apply to the installation of dynamic-link library (DLL) files.

Because of licensing restrictions of the Microsoft Dynamics NAV installation that is included in the ISV solution, this test is designed for situations where the ISV solution is the only solution that is integrated with a new Microsoft Dynamics NAV database.

---

You may need to provide a .txt file also to allow VARs to merge the solution into an existing database with customizations. You should note the specific country/region database for which the solution was written for and document necessary service packs and hotfixes.

#### *TEST METHODOLOGY*

The test vendor will use one of the following methods to confirm that the ISV has provided a complete list of resources.

To install with a .fob file:

The test vendor will confirm that the ISV has provided a complete list of all resources that are added to Microsoft Dynamics NAV. This list will be used to verify the removal of the product.

The test vendor will follow each step in the installation instructions in the order presented. The vendor should be able to complete the installation without consulting support personal or contacting the ISV.

To verify the .fob file requirements, the test vendor will follow these steps:

1. Open Microsoft Dynamics NAV, and then connect to the database.
2. Install the Microsoft Dynamics NAV license file.
3. Open Object Designer. On the **Tools** menu, click **Object Designer**.
4. Import the .fob file. On the **File** menu, click **Import**.
5. Locate the import file, and then click **Open**.
6. The .fob file includes modified objects. When prompted, open the import worksheet.
7. Verify that no objects are to be skipped. Objects are skipped if the version of the object in the database is later than the one in the .fob file.
8. Click **OK** to import the .fob file. The file should be imported without producing any errors.

To install with another method:

The test vendor will follow the installation instructions that are provided by the ISV. In this case, the version consistency is tested by [Requirement 1.4](#).

#### *CRITERIA FOR PASSING*

This requirement is mandatory. If the solution does not install correctly, then it will fail the test. If the solution produces FOB import errors, then it will fail the test.

## 6.2 The ISV solution must correctly register DLLs and COM components.

Type	Test method	Technology	Solution category		
Required	In-lab review	External	Simple	Complex	Hosted
			✓	✓	✓

### SUMMARY AND INTENT

If your solution installs any DLLs or COM components, including ActiveX controls, then you must provide a setup program. The setup program must record the COM components in the registry database of the operating system. The registry serves as a central configuration database for user, application, and computer-specific information.

### RESOURCES

None

### HOW TO COMPLY

Check the registry to ensure that your setup program functions correctly. Document the correct registry settings and include this information with your solution when you submit it for testing.

### TEST METHODOLOGY

During the in-lab review, the test vendor will install your application and review the registry to verify that the setup program registers all DLLs and COM components.

### CRITERIA FOR PASSING

This requirement is mandatory. If the solution does not correctly register the necessary DLLs and COM components, then it will fail the test.

## 6.3 The ISV solution must correctly deploy COM components to Microsoft Dynamics NAV Server and to client machines.

Type	Test method	Technology	Solution category		
Required	In-lab review	External	Simple	Complex	Hosted
			✓	✓	✓

### SUMMARY AND INTENT

You can author DLLs that extend your application with COM and can be called from application code. These DLLs can be set up to run on Microsoft Dynamics NAV Server, the RoleTailored client, or both. You should consider this when authoring your solution deployment and deploy the DLLs to the computers running Microsoft Dynamics NAV Server or running the RoleTailored client, depending on where they must be executed. Also, you should consider always deploying these DLLs to the same locations in the same order.

## RESOURCES

For more information, see “What’s New: Development Solutions for Microsoft Dynamics NAV 2009” which is available on the [Microsoft Dynamics NAV Developer Center](#).

## HOW TO COMPLY

Ensure that you only deploy components to Microsoft Dynamics NAV Server that will run on the server and deploy components to the RoleTailored client that will run on the client. Document the external components and include this information with your solution when you submit it for testing.

## TEST METHODOLOGY

The test vendor will install your solution on a two-computer setup and ensure that the DLLs are deployed correctly to Microsoft Dynamics NAV Server and to the RoleTailored client.

## CRITERIA FOR PASSING

This requirement is mandatory. If the solution does not correctly deploy necessary DLLs and COM components, then it will fail the test.

### 6.4 The ISV solution must correctly register add-ins on the computer running SQL Server and deploy add-in assemblies to client machines.

Type	Test method	Technology	Solution category		
Required	In-lab review	External	Simple	Complex	Hosted
			✓	✓	✓

## SUMMARY AND INTENT

RoleTailored client control add-ins are used to extend the RoleTailored client with custom functionality. A control add-in is a custom control or visual element for displaying and modifying data on RoleTailored client pages.

Control add-ins are delivered as .NET Framework–based assemblies, which are .dll files. A single assembly can contain one or more control add-ins. The installation and setup of control add-ins on RoleTailored client pages is divided between two tiers: RoleTailored client and the SQL database for Microsoft Dynamics NAV 2009.

For the computer running the RoleTailored client:

The ISV solution must provide an external install package that copies one or more assemblies to the Add-ins directory

On the computer running the RoleTailored client, copy the assemblies that contain the control add-ins to the Add-ins directory of the RoleTailored client installation or any subdirectory of that the installation. By default, the path to this folder is:

C:\Program Files\Microsoft Dynamics NAV\60\RoleTailored Client\Add-ins

You can also place assemblies in a subfolder of the Add-ins folder. This can be useful when you have multiple assemblies and dependencies.

For the computer running SQL Server for Microsoft Dynamics NAV 2009:

Register the control add-ins that are found in the assemblies in the **Client Add-in** table (table 2000000069).

#### RESOURCES

- For more information about control add-ins, see [Extending the RoleTailored Client Using Control Add-ins](#) in the *Microsoft Dynamics NAV 2009 Developer and IT Pro Documentation*.
- For more information about control add-in registration, see [Registration Tool for Dynamics NAV RoleTailored Client Add-ins](#).

#### HOW TO COMPLY

A control add-in must be registered in the **Client Add-in** table (table 2000000069) with at least its name and the public key token of its signature. Optionally, the file version of the add-in assembly and a description text can be added.

The ISV solution must provide an external install package that installs one or more assemblies to the Add-ins directory or a subdirectory of that the Add-ins directory.

#### TEST METHODOLOGY

The test vendor will verify that the control add-ins that are listed in the documentation have been correctly deployed to the computers running SQL Server and the RoleTailored client.

For the computer running SQL Server:

1. Open the Classic client.
2. On the **Tools** menu, click **Object Designer**.
3. Click **Tables**, and then locate the **Client Add-in** table (table 2000000069).
4. Click the table, and then click **Run**.
5. Verify that all the control add-ins from the list have been included in the **Client Add-in** table

For the computer running the RoleTailored client:

1. Open the Add-ins directory at C:\Program Files\Microsoft Dynamics NAV\60\RoleTailored Client\Add-ins.
2. Verify that all control add-ins from the list have been included in this folder and all listed assemblies are present in the directory or subdirectories.

## 6.5 After the ISV solution is installed, the Microsoft Dynamics NAV database must compile without errors.

Type	Test method	Technology	Solution category		
Required	In-lab review	C/SIDE	Simple	Complex	Hosted
			✓	✓	✓

### SUMMARY AND INTENT

After your ISV solution is installed, the Microsoft Dynamics NAV database must compile and function correctly.

### RESOURCES

None

### HOW TO COMPLY

You should install your solution and compile the Microsoft Dynamics NAV database to verify the integrity of the newly installed code.

---

**Note** If your solution registers external DLLs or COM components, then these should be installed on the computer before you install the solution.

---

### TEST METHODOLOGY

To verify this requirement, the test vendor will follow these steps:

1. Open Object Designer, and then click the **All Objects** button.
2. When all objects are displayed, select all Microsoft Dynamics NAV objects that were modified by the ISV.
3. Compile the database. On the **Tools** menu, click **Compile**. The compilation process should take 15 to 30 minutes.
4. The compilation process should report no errors and return you to Object Designer. If errors are reported, then on the **View** menu, click **Marked Only**.
5. Note the objects that are reported as errors. Report the compilation errors to the ISV before continuing.

---

**Note** The objects that compiled before the solution was imported must also be able to compile after the import.

It is acceptable that the following standard Microsoft Dynamics NAV 2009 objects will not compile when installed on a clean system:

Tables: 370, 5302

Reports: 99008512

Codeunits: 424, 5054, 5064, 5300, 5301, 5303-5312, 5500, 6810, 6815, 6817, 6870, 6872, 7152, 7700, 8610, 8611, 99008516, 99008517, 99008528

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#### CRITERIA FOR PASSING

This requirement is mandatory. If the solution causes the database to produce errors after the solution is installed, then it will fail the test unless an acceptable written explanation is provided for why this happens.

#### 6.6 The ISV must document the required versions and service packs of all dependent software programs, including Microsoft Dynamics NAV.

Type	Test method	Technology	Solution category		
Required	In-lab review	All	Simple	Complex	Hosted
			✓	✓	✓

#### SUMMARY AND INTENT

Your solution will have software dependencies. Additionally, Microsoft Dynamics NAV requires specific software and service pack versions to be installed. You must document these requirements and include the documentation in your test submission.

#### RESOURCES

None

#### HOW TO COMPLY

Provide the test vendor with a list of the software, including version numbers and service packs, that your solution requires.

#### TEST METHODOLOGY

The test vendor will review the documentation to verify that the required software list is provided.

#### CRITERIA FOR PASSING

This requirement is mandatory. If the solution does not include documentation for the software and service pack requirements, then it will fail the test.

#### 6.7 The ISV must document the Microsoft Dynamics NAV license that is required for their solution installation.

Type	Test method	Technology	Solution category		
Required	In-lab review	All	Simple	Complex	Hosted
			✓	✓	✓

#### SUMMARY AND INTENT

If your solution requires a specific Microsoft Dynamics NAV license, such as Business Essentials Edition, Advanced Management Edition, or other components, then you must document the license requirements.

#### RESOURCES

None

#### HOW TO COMPLY

Provide the test vendor with information about which Microsoft Dynamics NAV license that your solution requires.

#### TEST METHODOLOGY

The test vendor will review the documentation to verify that the required license information is provided.

#### CRITERIA FOR PASSING

This requirement is mandatory. If the solution does not include information on the required Microsoft Dynamics NAV license, then it will fail the test.

#### 6.8 The ISV must document the uninstallation procedures.

Type	Test method	Technology	Solution category		
Required	In-lab review	All	Simple	Complex	Hosted
			✓	✓	✓

#### SUMMARY AND INTENT

Customers must be able to uninstall an ISV solution. If your solution cannot be removed, then you must state this in your documentation.

#### RESOURCES

None

#### HOW TO COMPLY

Provide a complete list of all resources that your solution adds to Microsoft Dynamics NAV. You must also provide complete instructions for uninstalling your solution, including removing any imported code, DLL or ActiveX components, and registry entries. If it is not possible to uninstall your solution, then you must state this in the documentation. After the solution is uninstalled from the test system, Microsoft Dynamics NAV may not be functional.

#### TEST METHODOLOGY

The test vendor will confirm that the ISV has provided a complete list of all resources that are added to Microsoft Dynamics NAV. This list will be used to verify the removal of the solution.

If uninstallation is possible, then the test vendor will follow each step in the uninstallation instructions in the order that they are presented. The test vendor must be able to remove the solution without consulting the ISV. After uninstalling the solution, Microsoft Dynamics NAV may not be functional.

The test vendor will then review the list of components that the ISV solution installed to verify that the entire ISV solution has been removed.

---

**Note** The following user data must not be removed:

- *Customer data*, such as the database, configuration files, and other files that are placed in the installation folder after installing the product.
  - *Prerequisites*, such as external components that are required by the solution to work.
- 

#### CRITERIA FOR PASSING

This requirement is mandatory. If the solution can be uninstalled and does not uninstall completely, then it will fail the test unless you have a valid reason for not supporting uninstallation.

#### 6.9 The ISV solution must include installable demonstration data.

Type	Test method	Technology	Solution category		
Required	In-lab review	All	Simple	Complex	Hosted
			✓	✓	✓

#### SUMMARY AND INTENT

Demonstration data is useful for many purposes, such as sales demonstrations, training, and application testing. Therefore, you must deliver at least one demonstration company with your solution. Microsoft recognizes that some data centers do not allow installing demonstration data on production servers. You can deliver demonstration data as part of the main installation or as a separate installation, such as in a Virtual PC file. You must provide instructions that describe how to add the demonstration data to demonstrate the entire solution and all components.

#### RESOURCES

None

#### HOW TO COMPLY

The demonstration data must populate new tables or fields in your solution. You can provide data in the following ways:

- Supply XMLports so that users can import the demonstration data. You should include the XMLports in .fob file format with the data files. You can include the XMLports with the main application objects or as a separate .fob file.
- Provide a Microsoft Dynamics NAV object, such as a codeunit that populates the demonstration data for the ISV solution when it is run.
- Provide demonstration data in a backup (.fbk) file. If you provide an .fbk file, then you must ensure that the demonstration data is compatible with the latest version of Microsoft Dynamics NAV because the data is not validated when the backup is restored.

You must include complete instructions for adding the data to Microsoft Dynamics NAV.

## TEST METHODOLOGY

To verify this requirement, the test vendor will use one of the following procedures:

If the demonstration data is provided in a .fob file with XMLports or in a Microsoft Dynamics NAV object:

1. Verify that the ISV provides XMLports or codeunits with the solution, and then use Object Designer to import the objects.
2. Compile the objects. Follow the instructions supplied by the ISV to install the demonstration data.

If the demonstration data is provided in an .fbk file:

1. Import the .fbk file.
2. Check that the imported .fbk file does not generate any error messages.

To verify that table changes are consistent with the demonstration data, the test vendor will run a consistency test after your solution is installed:

1. Log on to the Microsoft Dynamics NAV client.
2. Open the database, and then open the company.
3. On the **File** menu, point to **Database**, and then click **Test**.
4. Select a test for **Primary Keys and Data**, **Secondary Keys**, and **Field Relationships Between Tables**.

The test vendor will run this test before and after the solution is installed and compare results.

## CRITERIA FOR PASSING

This requirement is mandatory. If the solution does not include demonstration data, then it will fail the test. If the database and demonstration data are not consistent, then the solution will fail the test.

### 6.10 Microsoft Dynamics NAV must start without errors after the ISV solution is installed.

Type	Test method	Technology	Solution category		
Required	In-lab review	All	Simple	Complex	Hosted
			✓	✓	✓

## SUMMARY AND INTENT

This requirement is designed to eliminate poor end-user experiences that result from new installations that produce errors the first time that Microsoft Dynamics NAV with an installed ISV solution is started. This requirement was implemented in response to specific feedback that some ISV solutions result in errors that require manual intervention when starting Microsoft Dynamics NAV with the installed solution for the first time.

## RESOURCES

None

## HOW TO COMPLY

Your installation guidance or setup must be sufficient to avoid these errors.

## TEST METHODOLOGY

After installation, inspect for a problem-free solution launch and perform some typical operations as defined in the Microsoft Dynamics NAV Consistency Verification Test. For more information, see [Appendix B](#).

## CRITERIA FOR PASSING

This requirement is mandatory. If the solution causes the system to stop responding or if other serious errors are reported, then it will fail the test.

### 6.11 The ISV solution must use the Rapid Implementation Methodology (RIM) to increase setup speed.

Type	Test method	Technology	Solution category		
<b>Required</b>	In-lab review	All	Simple	Complex	Hosted
			✓	✓	✓

## SUMMARY AND INTENT

The Rapid Implementation Methodology (RIM) toolkit addresses the issue of automation and simplifying recurrent processes in implementation (setup) projects and helps identify the exact information that is required to set up solutions and allow them to run smoothly.

## RESOURCES

See the Dynamics NAV RIM Users Guide 2.0.pdf file, which is included on the product media.

## HOW TO COMPLY

For all solutions, the RIM Usage Questionnaires must be completed. See [Appendix D](#).

Additionally, for solutions that only use RIM, ISVs should follow the instructions in the *Microsoft Dynamics NAV 2009 Rapid Implementation Toolkit User's Guide*.

Pay particular attention to the following:

- **Setup questionnaire updates:** To update an existing setup questionnaire, create a new question line that contains a field from the related setup table that is not included in the present questionnaire.

If the vertical solution includes setup tables that are not included in Microsoft Dynamics NAV, then create a new questionnaire header for each table and link the header to each database table.

Use the Update Questions function to create questionnaire lines. The information will appear in the lines with a question number, the question (which is the same as the field name followed by a question mark), and the valid options for the setup field.

- **Changes to core tables:** If you make changes to existing core Microsoft Dynamics NAV tables, then implement the changes throughout the entire hierarchy of posting groups and in the master data templates.

You can add new ISV-related tables and data.

- **Changes to the master data:** If your solution contains information to be added to the five master data types that are covered by the RIM master data templates, or it requires a new master data template, perform the following steps.
  1. To add the information, add a new line to the existing master data template. Selecting the **Mandatory** field is for informational purposes only, and the data is not validated.
  2. You can create a new master data template that is related to the master data table and add the necessary fields and possible default values.

If the new master data template is to be used in the daily operations from a master data record, then you may need to add a function to the relevant form.

Data templates are useful if you need to transfer data from another system, such as when doing data migration from the customer's legacy system.

- **Changes to ISV-specific data:** When you add ISV-specific data, you can export the contents from the **Migration Overview** window (form 8614) to an ISV-specific .xml file. You should include any additional ISV-related tables in the **Migration Overview** form. If you want to make it possible to create a lookup to the data tables from the **Migration Overview** form, then enter the form number in the **Form ID** field.

Create one .xml file per industry segment, and then use the .xml file format. We recommend that you do not use the Excel format. The new .xml file can be an update of the core .xml files or a new file.

Update core files in the Company Setting\ENU folder, and then update the .xml configuration file manually if there are changes to the data links

The new .xml file is placed in the Company Settings\Culture folders. For example, you can put a German version in the Company Settings\DEU folder, and then update the data links in the .xml configuration file in the Company Settings\Culture folder.

- **Changes to company types:** Include a list of company types that are added or modified in your submission package for the test vendor.

#### TEST METHODOLOGY

For all solutions, the test vendor will validate that the RIM Usage Questionnaires in appendix D have been completed.

Additionally, for solutions that only use RIM, the test vendor will:

1. Create a new company, and then select a company type.

2. Open the **Migration Overview** form (form 8614), and then validate that the new company contains the following information:

- Questionnaires
- Setup data
- Master data template header and lines

The test vendor will also verify that no errors are reported on the form.

The vendor will use the list of all modified or new XML company types that the ISV provides and repeat this process.

#### *CRITERIA FOR PASSING*

This requirement is mandatory. If the RIM Usage Questionnaire has not been completed, then the solution will fail the test.

## BACKUP AND RESTORE REQUIREMENT

Your application must meet the following requirement:

- [Requirement 7.1: The ISV must include procedures to back up and restore both the ISV solution and the data if the standard Microsoft Dynamics NAV backup is insufficient.](#)

### **7.1 The ISV must include procedures to back up and restore the ISV solution and data if the standard Microsoft Dynamics NAV backup process is insufficient.**

Type	Test method	Technology	Solution category		
<b>Required</b>	In-lab review	All	Simple	Complex	Hosted
			✓	✓	✓

#### *SUMMARY AND INTENT*

A customer or partner must be able to back up and restore your solution and all associated data. Therefore, if your solution requires any special backup or restore procedures, then you must include documentation that describes what should be backed up, how to back it up, and how to restore data.

Backup procedures should also include any solution data that is stored outside Microsoft Dynamics NAV.

#### *RESOURCES*

None

#### *HOW TO COMPLY*

If your solution requires the user to perform any special steps to backup or restore data that is not a part of a standard Microsoft Dynamics NAV backup process, then you must prepare a document that describes the backup process. Include the following information:

- What to back up
- How to back it up

- How to restore the data, including data that is stored outside Microsoft Dynamics NAV

Solutions that store data outside the Microsoft Dynamics NAV database must have additional documentation.

#### TEST METHODOLOGY

The test vendor will verify that you have included appropriate backup and restore procedures. The test vendor will perform the backup and restore processes to make sure that it functions correctly. The test vendor may use your demonstration data to perform this test.

#### CRITERIA FOR PASSING

This requirement is mandatory. If the solution does not include appropriate backup and restore procedures, then it will fail the test.

## UPGRADE AND MAINTENANCE REQUIREMENTS

Your solution must meet the following requirements:

- [Requirement 8.1: The ISV must provide database upgrade scripts.](#)
- [Requirement 8.2: The ISV must use file versioning for DLLs and COM components.](#)

### 8.1 The ISV must provide database upgrade scripts.

Type	Test method	Technology	Solution category		
<b>Required*</b>	In-lab review	All	Simple	Complex	Hosted
			✓	✓	✓

\*Required if the ISV solution has been updated.

#### SUMMARY AND INTENT

This requirement ensures that upgrades are easier for partners by providing scripts that support database upgrades.

#### RESOURCES

None

#### HOW TO COMPLY

Prepare and document your upgrade scripts. Your documentation must list the names of the upgrade scripts and the tables that each script affects. You should provide more in-depth documentation, but it is not required.

#### TEST METHODOLOGY

The test vendor will verify that you have included the required upgrade script documentation, which lists the scripts and the affected tables.

#### CRITERIA FOR PASSING

This requirement is mandatory. If the solution does not include upgrade scripts and documentation, then it will fail the test.

## 8.2 The ISV must use file versioning for DLLs and COM components.

Type	Test method	Technology	Solution category		
Required	In-lab review	All	Simple	Complex	Hosted
			✓	✓	✓

### *SUMMARY AND INTENT*

All executable files, such as DLLs and COM components including ActiveX controls, must have versioning metadata that is associated with them. Installation programs use this metadata to confirm that correct versions are in place before applying an upgrade, service pack, or hotfix. Without this versioning information, an installation program could potentially corrupt the system by applying changes that cannot be synchronized with the files that are currently installed. Additionally, if a shared component fails, then correct file version information helps a customer identify the associated solution and file producer. The file's producer is the only entity that can regress the file. Therefore, the metadata must also include the company name.

### *RESOURCES*

None

### *HOW TO COMPLY*

Examine the file information for each DLL and COM component to verify that it includes the product name, company name, and file version number.

### *TEST METHODOLOGY*

The test vendor will review submitted code to determine if files contain metadata with the following elements:

- Product name
- Company name
- File version number

### *CRITERIA FOR PASSING*

This requirement is mandatory. If the solution does not use file versioning, then it will fail the test.

## **BEST PRACTICE GUIDELINES**

The following best practices are strongly recommended but are not part of the test process.

### **DESIGN AND DEVELOPMENT BEST PRACTICES**

An ISV solution should comply with the following best practices:

- [Best Practice 1.1: The ISV should follow Microsoft Dynamics NAV architectural guidelines.](#)
- [Best Practice 1.2: The ISV solution should follow reporting guidelines.](#)
- [Best Practice 1.3: Sensitive data should be transported in an encrypted form.](#)
- [Best Practice 1.4: The ISV solution should properly handle time zones, especially when working with Microsoft Dynamics NAV Web services.](#)
- [Best Practice 1.5: The ISV solution should not produce best practice tool errors.](#)
- [Best Practice 1.6: Company names should be properly encoded in Web services URLs.](#)
- [Best Practice 1.7: The ISV solution should follow application performance best practices.](#)
- [Best Practice 1.8: The ISV solution should follow keyboarding best practices.](#)

#### **1.1 The ISV should follow Microsoft Dynamics NAV architectural guidelines.**

Type	Test method	Technology	Solution category		
<b>Recommended</b>	None	C/SIDE	Simple	Complex	Hosted
			✓	✓	✓

#### *SUMMARY AND INTENT*

This recommendation is intended to protect customer investments by ensuring maximum ISV solution compatibility with the existing Microsoft Dynamics NAV product. It is also intended to prevent future upgrade issues that result from nonstandard implementations.

#### *RESOURCES*

For more information, see the following information:

- [Building a Vertical Business Success on Microsoft Dynamics NAV – White Paper – Best Practices for Business Processes and Tools](#) (requires PartnerSource login)
- [Microsoft Dynamics NAV 2009 Developer and IT Pro Documentation](#)

#### *HOW TO COMPLY*

Review the Microsoft Dynamics NAV 2009 Developer and IT Pro Documentation and the white paper. Create your design based on the principles that are described in those documents.

When you design your solution, document your solution design patterns in your design documents and specifications. If you are updating an existing solution, then perform this design for any new features that you are adding and consider if you need to do this retroactively for part of the existing

solution. Conduct design reviews to ensure that your solution uses the design patterns that you documented.

### 1.2 The ISV solution should follow reporting guidelines.

Type	Test method	Technology	Solution category		
<b>Recommended</b>	None	C/SIDE	Simple	Complex	Hosted
			✓	✓	✓

#### SUMMARY AND INTENT

ISV solutions should provide reporting that is consistent with the reporting functions of Microsoft Dynamics NAV.

We recommend that you upgrade the reports in your solution to the new RDLC report format if you plan to use the capabilities that are included in Microsoft Dynamics NAV 2009. New capabilities, such as sorting, charting, visibility toggling and drilling through to pages or other reports, are available. For more information about how to use the features and capabilities, see the [Microsoft Dynamics NAV Reporting](#) blog.

#### RESOURCES

See [Designing and Maintaining Reports](#) in the *Microsoft Dynamics NAV 2009 Developer and IT Pro Documentation*.

- See [Designing Reports for the RoleTailored Client](#) if you are designing reports for the RoleTailored client.
- See [Designing Report for the Classic Client](#) if you are designing reports for the Classic client.
- See [Redesigning Classic Reports with Visual Studio Report Designer](#) if you are migrating existing reports to work in the RoleTailored client.

#### HOW TO COMPLY

You should provide a list of reports as part of your submission.

### 1.3 Sensitive data should be transported in an encrypted form.

Type	Test method	Technology	Solution category		
<b>Recommended</b>	None	WSCalling	Simple	Complex	Hosted
		✓	✓	✓	✓

#### SUMMARY AND INTENT

If you pass sensitive application data in Web service requests or response messages, then consider how you can ensure that they remain private and unaltered while in transit. One possibility is to use transport-level encryption through SSL.

Web services SSL is disabled by default on Microsoft Dynamics NAV Server. If you want to use SSL, then you must activate it, and your computer must have trusted certificates.

To activate Web services SSL on Microsoft Dynamics NAV Server, you must open the CustomSettings.config file and change the value of the WebServicesSSLEnabled key to **true**.

#### RESOURCES

For more information, see:

- [Working with Web Services](#)
- [Building Secure Web Services](#)

#### HOW TO COMPLY

All sensitive data should be transported in an encrypted form.

### 1.4 The ISV solution should properly handle time zones, especially when working with Microsoft Dynamics NAV Web services.

Type	Test method	Technology	Solution category		
<b>Recommended</b>	None	All	Simple	Complex	Hosted
			✓	✓	✓

#### SUMMARY AND INTENT

Processing Web service requests by C/AL code that is running on Microsoft Dynamics NAV Server is performed in Coordinated Universal Time (UTC). Additionally, DateTimes that are passed in Web service requests and responses are in UTC. This is different from the RoleTailored client, which runs in the local user's time zone. You should convert between the local time and UTC. If a solution is developed in a single time zone, especially in a time zone that is the same as UTC zone, then it is possible to overlook the needed conversions, which can lock the user to one particular time zone.

#### RESOURCES

For more information, see [Working with Web Services](#) in the *Microsoft Dynamics NAV 2009 Developer and IT Pro Documentation*.

#### HOW TO COMPLY

When passing DateTimes between a Web service client and the server, convert times from the local client time zone to UTC. When processing results from Web service calls, convert times to the local time zone if you are in a different time zone from UTC. Respect system time zone settings on the client machine

### 1.5 The ISV solution should not produce best practice tool errors.

Type	Test method	Technology	Solution category		
<b>Recommended</b>	In-lab test	C/SIDE	Simple	Complex	Hosted
			✓	✓	✓

#### SUMMARY AND INTENT

ISV solutions should use the same coding standards that the Microsoft Dynamics NAV development team uses.

## RESOURCES

The following documents provide information about development best practices:

- [Building a Vertical Business Success on Microsoft Dynamics NAV – White Paper – Best Practices for Business Processes and Tools](#) (requires PartnerSource login)
- *Microsoft Dynamics NAV 2009 Developer Help*, which is located on the Microsoft Dynamics NAV product media in cside.chm.
- *C/SIDE Reference Guide*, which is installed with the Classic client.

The following tool can be used to validate compliance with best practices:

- Impuls Check Tool for Microsoft Dynamics NAV, which is available at <http://www.impuls-nbg.de/impuls/Products/iCheckTool>.

---

**Note** This tool is not part of the test and must be purchased separately.

---

## HOW TO COMPLY

Follow the guidelines in the documents that are listed in the Resources section.

Run the Impuls Check Tool on the new objects that are added or existing objects that are modified by your solution. The following error IDs should not be reported for the new objects or for entities that have been added by the ISV solution:

- 1012 Number of OptionCaptions is different than number of OptionStrings.
- 1015 Field names must not start with a blank.
- 2001 Reference to non-existing parent control.
- 3001 OnModify trigger must not contain ERROR Messages.
- 3006 The procedure was cut by the export.
- 3008 Name is empty.
- 3009 The name of non-temporary record variables should not begin with “Temp.”
- 3010 The name of temporary record variables should begin with “Temp.”
- 4005 Button’s access key has conflict with the client menu.
- 4006 Access Key is missing.
- 4009 Separator should not have a caption.
- 5001 Object names must not end with a blank.

If the solution provides multilanguage support, then the following errors should not be reported for the new objects or for modifications to existing objects:

- 3004 MESSAGE, ERROR, CONFIRM, STRMENU, and SELECTSTR should contain only text constants as text.
- 4001 Not all Multi-Language Captions exist.

- 4002 Not all Multi-Language OptionCaptions exist.
- 4003 Not all Multi-Language ToolTips exist.
- 4008 Not all Multi-Language PageNames exist.
- 4010 Text constant does not include all ML-languages.
- 4011 Text of different Multi-Language Captions is equal.

### 1.6 The company names should be properly encoded in the Web services URLs.

Type	Test method	Technology	Solution category		
<b>Recommended</b>	In-lab review	External	Simple	Complex	Hosted
			✓	✓	✓

#### *SUMMARY AND INTENT*

When an ISV solution is submitted for testing, it can contain client applications or systems that were developed outside Microsoft Dynamics NAV and call Web services that are exposed in Microsoft Dynamics NAV.

One segment of the URL to Microsoft Dynamics NAV Web services contains the name of the company in Microsoft Dynamics NAV that contains the data that is used by the Web service. We recommend that this path segment is percent encoded so that it stands out as an atomic path segment.

The encoding is significant when the company name contains special characters such as “ ”, “/”, and “.”. The “/” character can be confusing because it could be part of the company name or a path segment separator.

For example, the company name “CRONUS A/B” gets percent encoded to “**CRONUS%20A%2FB**”. A resulting Web service URL will then look like this:

<http://localhost:7047/DynamicsNAV/ws/CRONUS%20A%2FB/Codeunit/Customer>

For client applications that are developed with the .NET Framework, we recommend to percent encode the company name path segment URLs with the [Uri.EscapeDataString](#) method.

#### *RESOURCES*

For more information, see:

- RFC 3986
- Uri.EscapeDataString Method

#### *HOW TO COMPLY*

Ensure that you encode the company path segment with percent encoding. Use the [Uri.EscapeDataString](#) method for client applications that are developed with the .NET Framework.

### 1.7 The ISV solution should follow application performance best practices.

Type	Test method	Technology	Solution category		
Recommended	None	All	Simple	Complex	Hosted
			✓	✓	✓

#### SUMMARY AND INTENT

Performance issues should be considered throughout the development cycle, not at the end when the system is implemented. Many performance issues that result in significant improvements are achieved by careful design. To most effectively optimize the performance of your application, you should use the features that are built into C/SIDE to increase performance.

#### RESOURCES

For more information, see [Improving Application Performance](#).

#### HOW TO COMPLY

The ISV solution should use the features that are built into C/SIDE to increase performance, such as the DBMS cache, the commit cache, and the command buffer.

### 1.8 The ISV solution should follow keyboarding best practices.

Type	Test method	Technology	Solution category		
Recommended	None	All	Simple	Complex	Hosted
			✓	✓	✓

#### SUMMARY AND INTENT

Several shortcut keys have changed in the RoleTailored client in Microsoft Dynamics NAV 2009. These shortcut keys have changed for two reasons:

- To avoid conflicts with shortcut keys in the Windows operating system.
- To align with shortcut keys in the Windows operating system.

ISV solutions should make sure that their shortcut keys do not conflict with ones in Microsoft Dynamics NAV 2009

#### RESOURCES

For more information, see:

- [How to: Modify Shortcut Keys](#) in the *Microsoft Dynamics NAV 2009 Developer and IT Pro Documentation*.
- The “Keyboard Shortcuts” topic in the Microsoft Dynamics NAV 2009 RoleTailored client Help.

#### HOW TO COMPLY

The ISV solution should follow the following guidelines when creating shortcut keys:

- Do not use ALT+<key> because there could be conflicts with menu mnemonics in different locales.
- Do not override any system action shortcut. For example, do not use CTRL+SHIFT+Q as a shortcut because it will conflict with expand/collapse lines in hierarchical grids.
- Read the documentation about function keys for those that are available for partners. Many function keys are reserved for system actions.
- Do not use combinations of extended characters, which are Latin characters and digits that are outside the core ASCII set, that require more than one modifier key because they are not supported. For example, CTRL+ß will work on a German keyboard, but it will not work on a Romanian keyboard.

## USER EXPERIENCE BEST PRACTICES

Your solution should comply with the following recommendation:

- [Best Practice 2.1: The ISV solution should follow additional Microsoft Dynamics NAV 2009 user experience guidelines.](#)
- [Best Practice 2.2: The ISV solution should follow the user experience guidelines for RoleTailored client control add-ins.](#)

### 2.1 The ISV solution should follow additional Microsoft Dynamics NAV 2009 user experience guidelines.

Type	Test method	Technology	Solution category		
<b>Recommended</b>	None	All	Simple	Complex	Hosted
			✓	✓	✓

#### SUMMARY AND INTENT

Users of your solution should have a user experience that is consistent with Microsoft Dynamics NAV. Therefore, the user interface for your solutions should demonstrate correct aesthetics and consistency and must comply with additional elements of the Microsoft Dynamics NAV 2009 user experience.

We recommend that you follow the Microsoft Dynamics NAV 2009 user experience interface guidelines and use only the window and user interface component types that are described when you create ISV solutions for Microsoft Dynamics NAV 2009.

For user experience requirements for your solution, see [User Experience Requirements](#).

#### HOW TO COMPLY

Some basic user experience guidance is:

- **Identify the user's tasks and focus on it** — it's all about the user.
- **Progressive disclosure** — gives your users just what they need — and no more.
- **One task, one page** — everything a user needs for a given task should be on one page.
- **Clear the clutter** — help the user focus by removing irrelevant information to the given task.

- **Reduce search time** — give them what they need in each context.
- **Use visual cues for easy user recognition** — icons on the Action Pane and Cues in Activities parts make this easy.
- **Offer context relevant information** — FactBoxes help you do this.
- **Think about the user’s process** — display work processes together on List places.
- **Provide overviews** — chart panes, the activity part, the Role Center all help your users understand key information quickly.
- **Place processes in order** — arrange FastTabs and other elements in the order that they are used

Avoid typical violations:

- Don’t structure the navigation pane in buttons that resemble application modules. This will require users to jump between modules to complete an activity. Group the list places in the activities where they are needed.
- Don’t attempt to add lots of tasks to the Role Center — you can never fit all tasks in one page. Instead, think of list places like “rooms” that users go into to work with a type of data. Ensure that all relevant tasks are available from the list place.
- Don’t fill up the Role Center page with parts. Leave some of it empty, and only include parts that users need several times a day.
- Don’t design task pages to match the database structure. Create task pages that combine everything that users need to complete a task so that they don’t need to jump around.
- Don’t show just one action in the Action Pane. Save the space or add more of the slightly lesser used actions.
- Don’t fill the pages with information that could be relevant. Understand exactly what information that users need to see to make a decision and which fields that they must fill in to complete the task. If the page will be used by multiple user profiles for multiple tasks, then include the union of what is needed, but then configure away elements that each user profile will not need.
- Try to avoid pages with multiple lists, and never include more than two. Show read-only lists in a FactBox or show a FactBox with record counts for the related lists where the count acts as a link to open the list.

## 2.2 The ISV solution should follow the user experience guidelines for RoleTailored client control add-ins.

Type	Test method	Technology	Solution category		
Recommended	None	External	Simple	Complex	Hosted
			✓	✓	✓

### SUMMARY AND INTENT

When using RoleTailored client control add-ins to extend the RoleTailored client with custom functionality, users of your solution should have a user experience that is consistent with Microsoft

Dynamics NAV. Therefore, the user interface for your control add-ins should demonstrate correct aesthetics and consistency.

For user experience requirements for your solution, see [User Experience Requirements](#).

#### HOW TO COMPLY

Follow the user experience guidelines for control add-ins as described in [Appendix E](#) when you extend the RoleTailored client with custom functionality in your ISV solution.

## TRUSTWORTHY COMPUTING BEST PRACTICES

Your solution should comply with the following recommendations:

- [Best Practice 3.1: ISV development staff should complete security and Security Development Lifecycle training.](#)
- [Best Practice 3.2: The ISV solution should not bypass the Microsoft Dynamics NAV standard security model.](#)

### 3.1 ISV development staff should complete security and Security Development Lifecycle training.

Type	Test method	Technology	Solution category		
Recommended	None	All	Simple	Complex	Hosted
			✓	✓	✓

#### SUMMARY AND INTENT

As a part of its Trustworthy Computing initiative, Microsoft has adopted a process called the Microsoft Security Development Lifecycle (SDL) to help ensure that software development follows security best practices. Security best practices require that developers are aware of secure coding practices, including threat modeling and countermeasures.

In addition, SDL requires that developers must fix critical bugs that compromise security and perform security code reviews that are based on guidelines and checklists described in appendix D of *Writing Secure Code* by Michael Howard and David LeBlanc. These reviews help ensure that the software design meets minimal trustworthy computing standards.

The purpose of this best practice recommendation is to ensure that ISV software developers receive training on secure software development practices.

#### RESOURCES

For more information, see the following links:

- [Microsoft Trustworthy Computing Web site](#)
- [Microsoft Press: The Security Development Lifecycle](#)
- [Microsoft Press: Writing Secure Code, Second Edition](#)
- [Microsoft Press: Writing Secure Code Companion Content](#)
- *Security Hardening Guide* for Microsoft Dynamics NAV, which is available on the product media.

## HOW TO COMPLY

To meet the education recommendation, all developers should do the following tasks:

- Read *Writing Secure Code*, Second Edition, by Michael Howard and David LeBlanc.
- Complete the following two Microsoft eLearning security courses:
  - [Clinic 2806: Microsoft Security Guidance Training for Developers](#)
  - [Clinic 2807: Microsoft Security Guidance Training for Developers II](#)
- Read the *Security Hardening Guide* for Microsoft Dynamics NAV.

To verify that your staff has met this recommendation, you should prepare a checklist or training documentation, such as a training overview, Microsoft Office PowerPoint® presentation, class handouts, or syllabus.

### 3.2 The ISV solution should not bypass the standard Microsoft Dynamics NAV security model.

Type	Test method	Technology	Solution category		
Recommended	None	All	Simple	Complex	Hosted
			✓	✓	✓

## SUMMARY AND INTENT

The best practice recommendation is intended to prevent an ISV solution from reducing the security level that would have been present in the standard Microsoft Dynamics NAV product.

## RESOURCES

For information about the Microsoft Dynamics NAV security model, see [Creating a More Secure Application](#) in the *Microsoft Dynamics NAV 2009 Developer and IT Pro Documentation*.

## HOW TO COMPLY

If parts of your solution do not use the Microsoft Dynamics NAV security model, then you should document how security is enabled for those parts of your solution. You should explain how to more securely set up users and how to ensure that standard security cannot be compromised. You can do this in a separate security hardening guide or as a section in the installation and configuration guide.

An example of a risk is changing data when Microsoft Dynamics NAV is running under a general user identity instead of running under a specific user identity, such as when it is using the Application Server or when a specific user imports batches of data. You should create threat models or dataflow diagrams to determine if a problem exists and then document how to mitigate the risk.

Even if you only write C/AL code, you should still be aware of the security implications of importing and exporting data, and you should be careful when communicating with other servers.

Your ISV solution should include documentation that describes how security should be enabled on the additional objects that are added to Microsoft Dynamics NAV. The documentation should also include suggestions for roles that users would need to create and how to set permissions.

## **APPENDIX A: USER EXPERIENCE REQUIREMENTS**

This section describes the basic user experience requirements for Microsoft Dynamics NAV 2009.

### *Screen Resolution*

- Optimize your solution for a 1280 × 1024 screen resolution but your solution must be able to run on a 1024 × 768 screen resolution without causing user problems.

### *Navigation Pane*

- Do not include more lists than the user can see without scrolling on the **Home** button. If more lists are needed, then group them in additional activity buttons.

### **Role Center Page Type**

#### *Activities Part*

- Include the Activities part for all user profiles that handle transactions such as processing documents, filling journals, and updating reference data.
- Add a Cue to the activity group for each view that this user profile needs to watch to understand the workload and to plan the work.
- Group Cues in process groups and place them in sequence according to the user's workflow.
- Add links to related tasks for each group of Cues.

#### *Chart Pane*

- Provide each user profile with one or two metrics, such as speed, error rate, or profit, that help the user evaluate how well he or she is performing. Only add metrics that will change during the day and that the user can look to for guidance during daily work. If a metric only changes by a small amount weekly, then provide a link to a report instead and save the space for more important parts.

### **Department Page Type**

- Add links to the department's structure for every new navigation page or task page. Duplicating links in multiple departments is encouraged.
- Tag items in the MenuSuite structure with the correct properties to make them appear as a department or as a link of a specific content type.

### **Card Page Type**

- Do not include a grid, filter pane, or chart pane on the card page type.
- Promote actions that users use on at least a weekly basis to the Action Pane.

#### **Card Part**

- Promote actions that are available on individual fields inside the card part to the local **Actions** menu in the part.

- Include only one column of labels and fields.

#### ***Document Page Page Type***

- Promote the most frequently used actions on the Action Pane.
- Place FastTabs in an order that matches the user's workflow.
- Place fields and grids in a document task page inside a FastTab, even if there is only one group of fields. At run time, the FastTab frame is invisible if there is only one group. This reduces the visual borders to what is required to understand the grouping of the information.
- Group fields in logical categories.

#### ***List Part***

- Only include a single grid. Do not reuse a list page definition for a list part.

#### ***List Page***

- Create a list page for all entity types that users need to see or modify.
- Promote the most frequently used actions on the Action Pane.

#### ***List+ Page***

- Never include a filter pane or chart pane on a List+ page. Instead, use a pop-up window with a filter pane, as shown in request pages.
- Do not create a List+ page that resembles a document page, such as a page that includes fields in the first FastTab, a grid in the second FastTab, and more fields in the following FastTabs.

#### ***Journal/Worksheet***

- Always make journal or worksheet page types be in edit mode.
- Allow the user to edit or delete lines before the final action is activated if the task page is filled in by a batch job.
- Promote the most frequently used actions to the Action Pane.

#### ***Wizards***

- Design each FastTab that becomes a wizard page so that it contains clear instructions on what to do in the page, which is the business goal. Do not include instructions on how to interact with the controls.

#### ***Confirmation Dialog Box***

- Include a question for the user to answer at the top of the page.
- Place data fields with information that the user needs to make a decision in a FastTab if the page includes data fields.

- Configure confirmation dialog boxes so that data input only provides parameters for processing and not data that is stored. If more than four input fields are needed, then you must use a task page.

### ***UI Parts***

- See the requirements for Role Centers and FactBoxes.

### ***FactBoxes***

- In task pages, map the order of FactBoxes to the order of the FastTabs so that FactBoxes that are related to the top FastTab are placed in the top.
- Do not use FactBoxes for information that is already available on the task page.
- Do not display more FactBoxes than the user can see without scrolling.

### ***FastTabs***

- Promote actions to the local Actions menu in the FastTab header.

### ***Command bar***

#### *Home*

- Place global commands that apply to Microsoft Dynamics NAV in general on the **Microsoft Dynamics NAV** menu in the navigation window.
- Promote the most frequently used actions and reports for each user profile to the **Actions** menu and the **Reports** menu on the Home.

#### *List Places and Task Pages*

- Add commands that users can apply to the task pages in general to the **Actions** menu in the task page.
- Add commands that apply to an individual line or part to the **Actions** menu on a specific part, such as a FastTab or FactBox.
- Place commands that open related lists of documents, ledger entries, statistics, or similar transaction documents in the **Related Information** menu.
- Place all reports in the **Reports** menu on the command bar.

### ***Capitalization***

- Use title-style capitalization for titles, such as window titles, page titles, names of actions, and titles in all types of header bars and field groups.
- Use sentence-style capitalization for all other UI elements.
  - **Exception:** For legacy solutions, you may use title-style capitalization for command buttons, menus, and column headings if necessary to avoid mixing capitalization styles.

- Be conservative in capitalizing for features and technology names. Typically, only major components should be capitalized with title-style capitalization. Some examples are Analysis Services, cubes, and dimensions.
- Be consistent in capitalizing for feature and technology names. If the name appears more than once in the user interface, it should always appear the same way. Likewise, across all user interfaces in the program, the name should be consistently presented.
- Do not capitalize the names of generic user interface elements, such as toolbar, menu, scroll bar, button, and icon. Do capitalize Address bar and Links bar.
- Do not use all capital letters for keyboard keys. Instead, follow the capitalization that is used by standard keyboards or use lowercase letters if the key is not labeled on the keyboard. For example, use spacebar, Tab, Enter, Page Up, and Ctrl+Alt+Delete instead of SPACEBAR, TAB, ENTER, PG UP, and CTRL+ALT+DEL.
- Do not use all capital letters for emphasis. Users can regard this as “shouting” and instinctively dislike it, and it is also more difficult to read. To warn users of potentially serious consequences of a choice or setting, use a warning icon and a clearly worded explanation of the situation. You do not need to add the term WARNING in all capital letters.

#### ***Globalization and Localization***

- Choose a width that is appropriate for the longest valid data for controls with variable contents, such as list views and tree views.

## **APPENDIX B: MICROSOFT DYNAMICS NAV CONSISTENCY VERIFICATION TEST**

Company:

Solution:

Version:

Prepared by:

Date Prepared:

- Identify the intended purpose of the product.

Specify what fundamental service that the product is supposed to provide. To the extent possible, define the audience for the product. Write a paragraph that briefly explains the purpose of the product and describes its intended audience.

### **Example:**

*Test Solution* is a solution for managing data warehouse that enables the user to define the data warehouse strategy in a multifacility and multiuser environment.

### **Describe the product purpose:**

- Identify the most representative roles for your solution.

Define which functional work roles you're designing your product for and what role centers represent each role.

### **Example:**

*Project Manager (Role Center ID = 9051): A Project Manager will typically be responsible for Project Initiation, Scheduling, Resource Management and Project Budget management.*

- Identify the most representative primary functions for each role of your solution.

Term	Definition	Notes
Primary function	Main usage of the product — the function that is so important that, in the estimation of a typical user, its inoperability or impairment would make the product unfit for its purpose.	<p>A function is <i>primary</i> if you can associate it with the purpose of the product and it is essential to that purpose.</p> <p>Primary functions define the product. For example, the function of adding text to a document in Microsoft Office Word is so important that the product would be useless without it. Groups of functions that are taken together could be a primary function. For example, although no single function on the drawing toolbar of Word is primary, the complete toolbar might be primary. If the toolbar is primary, most functions on that toolbar should be operable for the product to pass the test.</p>

Examples of primary functions:

- Manage cross-docking operations.
- Manage stock environment.
- Manage IT interoperability with a fast carrier company.

**List all primary functions:**

- Identify the most representative contributing functions for each role.

Term	Definition	Notes
Contributing function	Any function that contributes to the utility of the product but is not a primary function.	Although contributing functions are not primary, their inoperability could be a reason for failure. For example, users may be able to do useful things with a product, even if it has an Undo function that never works, but most users will find that unacceptable. Such a failure would violate fundamental expectations about how products should work.

**Example of a contributing function:**

- Generate a 3-D report.

**List all contributing functions:**

- Specify potential instabilities and challenging data.
  1. List five to 10 functions or groups of functions (preferably primary functions) for focused instability testing.
  2. Specify challenging data for each selected function. Think of large, complex, or otherwise challenging input.

**Examples:**

- Functions that interoperate with other products (for example, object linking and embedding, file conversion).
- Functions that handle events external to the application (for example, wake up a sleeping computer when a fax arrives).
- Functions that make intensive use of memory.
- Functions that interact extensively with the operating system.
- Functions of unusual complexity.
- Functions that change operating parameters (for example, preference settings).
- Functions that manipulate operating system configuration.

- Design and record a consistency verification test.

**Prerequisites:**

List any action that must be performed before the consistency verification test can be executed.

**Examples:**

- Install Microsoft SQL Server 2005.
- Use radio frequency identification (RFID) to identify hardware.

**Required Information:**

List any information that a user must know to perform the consistency verification test.

**Examples:**

- User must log on as User *username*.
- User must know the product serial number.
- User must know the account passwords.

**Test Procedure:**

Complete the following procedure to test each primary function of the application. You must describe each step that is required to test a primary function. You can combine similar functions, if appropriate.

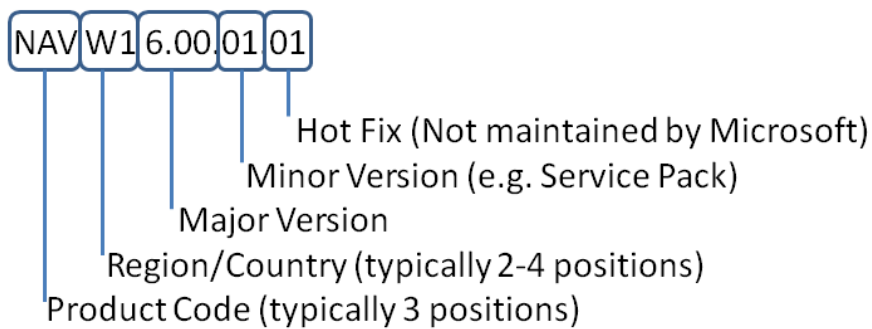
**Example:**

- Manage cross-docking operations.
  1. Define the goods involved.
  2. Determine the delivery locations.
  3. Determine the transport company.
- Manage the stock environment.
  1. On the **File** menu, click **Save**.
  2. Type the file name in the field, select the location for the file, and then click **OK**.
- Manage IT interoperability with a fast carrier company.
  1. Configure database access.
  2. Define user rights and circuit approval.

## APPENDIX C: STANDARD MICROSOFT DYNAMICS NAV VERSION CONVENTIONS

This section describes the object version number syntax that is used when labeling the Microsoft Dynamics NAV base product and all products that are used with the Microsoft Dynamics NAV base product.

The following illustration demonstrates the Version List labeling of all objects that are provided in Microsoft Dynamics NAV.



Note that labeling hotfixes is a recommended approach when applying hotfixes in an installation and does not exist in objects that are provided by Microsoft.

When an existing object is modified, such as when a standard object is modified by localization, the labeling of the modification is added to the Version List and is separated by a comma. The following illustration demonstrates the labeling for a standard object that has been modified by local functionality changes:

Type	ID	Name	Version List
	39	Purchase Line	NAVW16.00.01,NAVCH3.70.01

The following information is contained in the Version List column:

- The object is affected by W1 functionality and local functionality, where the object is based upon a W1 object and modified with local functionality.
- The W1 object was last changed or the object was created in connection with Microsoft Dynamics NAV W1 version 6.00 with W1 service pack 1.
- The local functionality that is contained in the object was last changed or the local functionality was created in connection with Microsoft Dynamics NAV CH 3.70, local service pack 1.

Objects that are modified multiple times during the localization process are also tagged with one reference for each modification, and the reference always refer to when the object was changed or created.

The following illustration demonstrates how kitting, which is a cross-localization feature, uses its own product code (KIT), to make it possible to easily identify objects that were modified by this feature:

Type	ID	Name	Version List
	14	Location	NAVW 16.00.01,NAVNA5.00.01
	15	G/L Account	NAVW 16.00,NAVNA4.00.01
	17	G/L Entry	NAVW 16.00,NAVNA5.00.01
	18	Customer	NAVW 16.00.01,KITNA5.00,NAVNA6.00.01
	19	Cust. Invoice Disc.	NAVW 16.00
	21	Cust. Ledger Entry	NAVW 16.00.01,NAVNA4.00.01
	23	Vendor	NAVW 16.00,NAVNA6.00.01
	24	Vendor Invoice Disc.	NAVW 16.00
	25	Vendor Ledger Entry	NAVW 16.00.01,NAVNA4.00.01
	27	Item	NAVW 16.00.01,KITNA6.00.01,NAVNA4.00.01
	30	Item Translation	NAVW 16.00
	32	Item Ledger Entry	NAVW 16.00.01,NAVNA4.00.01
	36	Sales Header	NAVW 16.00.01,KITNA6.00,NAVNA6.00
	37	Sales Line	NAVW 16.00.01,KITNA6.00.01,NAVNA5.00.01
	38	Purchase Header	NAVW 16.00.01,NAVNA5.00.01
	39	Purchase Line	NAVW 16.00.01,NAVNA5.00.01

## PARTNER FUNCTIONALITY OBJECTS

When you modify objects that are provided by Microsoft Dynamics NAV, you must add a comma-separated reference to the partner version list for local or cross-localization modifications.

We recommend that you do not Microsoft Dynamics NAV and other product codes that are used by Microsoft Dynamics NAV. Partners can use any other conventions for versioning of their objects. We recommend aligning your versioning conventions with the Microsoft versioning conventions for major and minor version and hotfix references. There are no restrictions to the number of characters that can be used to reference the Product Code or Region/Country values in the Version IList.

## APPENDIX D: RIM USAGE QUESTIONNAIRES

### Implementation Questionnaire

The Implementation Questionnaire is a collection of industry-specific questions and suggested answers that help you update the contents of Microsoft Dynamics NAV setup tables (for example, tables 79, 98, 311, 312, 313, and so on).

The questionnaires help structure and document business information and data based on a detailed discussion about specific solutions. The information collected helps reduce the implementation workload by streamlining the repetitive tasks any implementation requires, such as setting up local address formats, posting of discounts, automatic cost postings, and number series.

The questionnaire guides the user and the implementation consultant through the Microsoft Dynamics NAV setup requirements from a business perspective to ensure that the setup reflects the customer's business rules. The questionnaire can be presented as an Excel Workbook, so the user needs no prior Microsoft Dynamics NAV training to be able to work with the questionnaire.

	Questions	Answers	Comments
1.0	Have you used the Implementation Questionnaire in your solution?		
1.1	Have you added information to the Implementation Questionnaire?  (If YES please describe the additions in column <b>Comments</b> )		
1.2	If you have answered NO in 1.0 Please describe the reason for not using the Implementation Questionnaire in column <b>Comments</b> .		

### Industry-Specific Setup Data

A study of a number of implementation projects has shown that some setup tables in Microsoft Dynamics NAV contain a lot of common data for companies in the same industry segment.

The industry-specific setup data in RIM is a repository for such common data, which has been collected by industry specialists with experience from many implementation projects. Reusing common data saves implementation time and makes a more industry-specific setup possible.

	Questions	Answers	Comments
1.0	Have you use the Industry-Specific Setup Data in our solution?		
1.1	Have you added data to the Industry-Specific Setup Data?  (If YES please describe the type of data you have added in the column <b>Comments</b> )		
1.2	If you have answered NO in question 1.0.  (Please describe the reason for not using the Industry-Specific Setup Data in the column <b>Comments</b> )		

## Using Master Data Templates

Nearly all implementation projects include the task of migrating the customer's legacy master data.

The templates included in RIM can make this task easier. Rather than having to build a specific function to transfer master data for each individual project, RIM makes it possible to only have to transfer a limited amount of information, as illustrated in the following example:

In Table 18, you can select customer master data by selecting general information fields such as: Name, Address, Postcode, and City; and communications fields, such as: Phone, Fax, E-mail, and Homepage. You can then link to the master data template which contains mandatory information for that customer group. You then apply the data to the database and the program transfers customer master data ready for use.

The master templates also make it easier to create specific master data to train end-users and to use in daily operations. Once implemented, you only have to enter, for example, the item description, (the program provides the item number automatically – depending on the setup) and then apply the appropriate template; and the mandatory fields are correctly copied from the template to the actual master data record.

	Questions	Answers	Comments
1.0	Have you used Master Data Templates in your solution?		
1.1	Have you added Master Data Templates? (If YES please describe which master data types in the column <b>Comments</b> )		
1.2	If you have answered NO in question 1.0. Please describe the reason for not using the Master Data Templates in the column <b>Comments</b> .		

## **APPENDIX E: USER EXPERIENCE GUIDELINES FOR ROLETAILORED CLIENT CONTROL ADD-INS**

### GENERAL LONG-TERM GUIDELINES

- Avoid mimicking RoleTailored client controls inside the control add-in. By leaving them outside the control add-in and using standard RoleTailored client controls, you have no upgrade work when the standard controls change visual appearance or get new standard behaviors.
  - Build the control add-in so that it only contains special elements inside the control, such as a data visualization. Leave command presentation, filtering, FactBoxes, and other elements outside the control add-in. Embed the control add-in in a RoleTailored client window with its support for standard command presentation, filtering, FactBoxes, and other elements.
  - Include interaction inside the control add-in for direct manipulation, such as dragging elements.

This approach can be difficult in Microsoft Dynamics NAV 2009 because the available interfaces are limited. If you must compromise this guideline, then try to isolate the problem. For example, build a clean data visualization with support for dragging but without an Action Pane. Then encapsulate that in a second control add-in that emulates the Microsoft Dynamics NAV 2009 command presentation. When APIs become available so the standard Action Pane can send commands to a control add-in on the page, remove the outer custom control.

There are two generalized categories of controls

- Traditional controls

Controls that are recognized by users because they know them from the operating system or other applications such as Windows, Office, or common Web applications. Each control fulfills a specific, recognized purpose or task. Users expect that every time they face that purpose or task in any application, including yours, they will be presented with the same control. This reduces training and boosts productivity.

- Custom controls

Controls that fulfill a purpose or task that traditional controls cannot support.

- If the control is adding a new behavior to a standard control, then it must fully look and behave like the standard control except for the added behavior.
- If the control serves a new purpose such as visualizing data, then it must look distinctly different from traditional controls.

Controls can appear in the following contexts:

- An embedded custom control, such as a custom FactBox, extended version of a standard control, or another custom part inside a normal RoleTailored client window. See Guideline A.
- A window that mainly features a custom control and is used among normal RoleTailored client windows. For example, you could have a window with a chart, map, Gantt chart, or simulation.

The custom control takes up most of the window. The window may also include commands or related information outside the control. See Guideline A.

- An immersed experience or full-screen experience for longer use. For example, this could be a cash register application, production machine interface, or other application that users stay within without switching to normal RoleTailored client windows as part of their work. The custom application may offer an experience that is very different from the RoleTailored client experience. See Guideline B.

## GUIDELINE A

This guideline is for UI that is used by users who are also to some degree exposed to the RoleTailored client experience.

- For a custom control in this mixed experience, the subcontrols inside it must follow these guidelines:
  - If the purpose of a subcontrol is the same as the purpose fulfilled by a control that is available in the RoleTailored client, then the subcontrol must look and behave exactly like the standard control and include all its behaviors  
  
For example, if it is necessary to build command presentation inside the custom control, then you must use an Action Pane for page-global commands and a FastTab or FactBox Actions menu for local commands.  
  
The Action Pane or Actions menu must mimic the standard RoleTailored client control. This ensures consistent use of the same control for the same purpose and consistent look and behavior for a specific control across all windows.
  - If the purpose of a subcontrol is not supported by any RoleTailored client control but instead by a control found in that is found in Windows, Office, or commonly used Web applications, then the subcontrol must align with the guidelines for that application. In all cases, align visual style and coloring with the color palette of Microsoft Dynamics NAV where relevant.
    - For controls that are found in Windows, see the [Windows User Experience Guidelines](#).
    - For controls that are found in Office, see the Office design guidelines.
    - For controls that are found in common Web applications, align with the behavior found in that Web application.

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## GUIDELINE B

This guideline is for UI that is used by users who are not exposed to the RoleTailored client experience.

- Consider if a standard already exists for the domain for which you are building, such as the Windows Touch guidelines for touch UI on laptops and larger devices.
- Think about which type of UI that the users are most exposed to already. To the extent relevant, follow the design guidelines for those applications.
- Look at best-of-breed application designs within the domain that you are building for inspiration. Where possible, use the same presentation of information and the same interaction principles.

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