blueprism®

Robotic Process Automation Software

Guide to Creating a Blue Prism Process

BLUE PRISM LEARNING

Version: 1.1.001

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Introduction

This guide is intended to supplement the Blue Prism® Foundation Training course and other mandatory training modules.   It is aimed at students who are beginning to put their education into practice.

This guide will walk you through the main considerations when creating a new process in Process Studio

Training Prerequisites

Before creating your first process the following mandatory training should be completed:

- Blue Prism Foundation Training course
- Guides and modules related to Exception Handling and Work Queues
- Blue Prism Basic Template Instructions should be read and understood
- Blue Prism Lifecycle Orientation solution should be imported and understood

This guide does not cover the Object Studio build of a solution. For training related to how best to build your Objects please refer to the following in the Portal:

- Blue Prism Foundation Training course
- Object Layer Design tutorial
- The Object Design Instruction (ODI) example available in the Lifecycle Orientation Sample Delivery Documents
- The completed objects available in the Lifecycle Orientation solution which should be imported into your own environment and understood
- The interface specific guides available in the Learning/Guides area of the Portal

Process Build – Step 1: Validate Pre-requisites

Before you can start building your Blue Prism process, you need to validate everything is in place that you need to be able to create a solution that meets the business requirements.

Project Prerequisites

Work should not start on creating your process until the business process you want to automate has been correctly defined and the designs outlining what you need to build have been created and signed off.

Delivery Methodology Pre-requisites:

- Process Definition Document (PDD). The PDD defines the business process at a granular key stroke level and describes all the business rules and decisions that are made. The PDD should be signed off as correct by the business.
- The Solution Design document (SDD). The SDD is a high level design document that describes how the entire solution is going to be built. The SDD should be peer reviewed by an experienced Blue Prism developer or mentor, and approved in accordance to the delivery methodology in your organisation.
- The Process Definition Instruction (PDI). The PDI is a low level design document that describes exactly how the process should be built including Work Queues, Environment Variables, Alerts, etc. The PDI should be peer reviewed by an experienced Blue Prism developer or mentor, and approved in accordance to the delivery methodology in your organisation.

Examples of all these project delivery documents can be found in the Lifecycle Orientation training sample delivery documents.

Agile Methodologies:

If your organisation is using an Agile Methodology for Blue Prism development the requirements still need to be defined and your solution still needs to be designed.

It is a common misconception of those inexperienced with agile, who choose this methodology on the basis of thinking that their project can be delivered more quickly and easily by avoiding documentation. But agile is not an excuse for skipping documentation.

Agile is an iterative development methodology and when done correctly it will still include agreed definitions of what needs to be built and a design of how it going to be implemented in each delivery iteration.

Environment Pre-requisites

As well as the necessary approved documentation being in place, before you can start work on building your process ensure everything you need is in place for you to be able to create a solution that is correct.

- A development environment exists that matches the production environment as closely as possible (same operating system version, same browser version, same system versions, same screen resolution).
- Blue Prism product is installed and working. You can sign into the Blue Prism product.
- Test data exists which can be used during your process build so you can step through and run your process end to end.

To validate that the development environment is fit for purpose, you should be able to 'smoke test' the environment by manually working the business process that you are going to build end-to-end.

People Pre-requisites

You cannot create a Blue Prism process without being able to contact people with expertise in either the business process you want to automate or the technical environment in which you are working

The following people should be available to you:

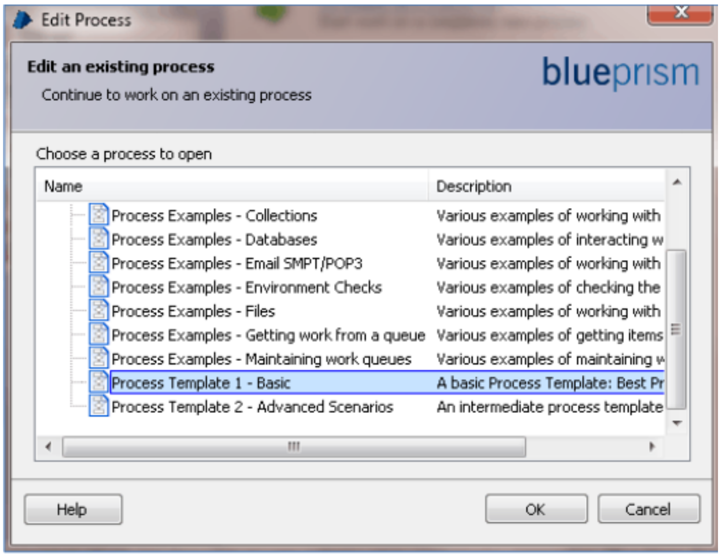
- A Subject Matter Expert (SME) is available to you during your process build. The SME is someone that knows the business process very well, ideally having worked the process manually. The SME needs to be available to you when you have a query about the business process and also to validate the process you create prior to User Acceptance Testing (UAT).
- You should have contact details for who to contact in the IT department if there is an issue with your development environment, such as a connectivity or network fault or a system that is unavailable to you.

Process Build – Step 2: Process Template

All processes built in Blue Prism **MUST** start with a Blue Prism Process Template. Using a process template ensures the following benefits:

Why use a Process Template?

- Save time: the Process Templates have already made a start in building your Process logic for you.
- Make support easier: by using Process Templates everyone's Processes looks the same, making them easier to understand.
- Ensure best practice: the Process Templates already contain all the work queue, exception handling, and stop decision logic that are outlined in this guide.



Edit Process

Edit an existing process

Continue to work on an existing process

Choose a process to open

Name	Description
Process Examples - Collections	Various examples of working with
Process Examples - Databases	Various examples of interacting w
Process Examples - Email SMPT/POP3	Various examples of working with
Process Examples - Environment Checks	Various examples of checking the
Process Examples - Files	Various examples of working with
Process Examples - Getting work from a queue	Various examples of getting items
Process Examples - Maintaining work queues	Various examples of maintaining w
Process Template 1 - Basic	A basic Process Template: Best Pr
Process Template 2 - Advanced Scenarios	An intermediate process template

Your own organisation might want to expand on the standard Process Template provided by Blue Prism to add in common alerting or credentials logic that is to be used for all your solutions.

Because of the importance of always using a Process Template the first thing to do when starting to build a new Process is to open a Process Template and use the Save As menu option to save the template as the name of the new process you want to create.

Process Build – Step 3: Implementing the Process design

Once you have saved a copy of the template as your new process you can start amending it to add your process logic in accordance to the peer reviewed PDI design document.

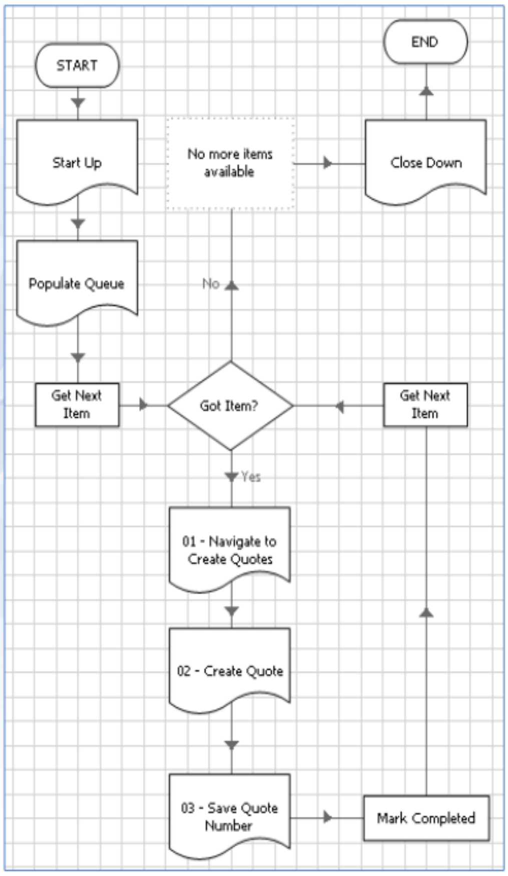
This section explains many of the best practices that should be implemented in your processes and which are enforced by your use of a Process Template.

For a working example of a process that implements all these features you should import and review the Create Quotes Process that is distributed as part of the Lifecycle Orientation training solution.

Process Main Page:

Your Main Page should be a simple high level flow diagram that uses sub-pages

On the right is the Main Page of a process with most of the process logic placed in sub-pages



Standard Sub-Pages:

- Start Up – a sub-page that launches and logs into applications
- Close Down – a sub-page that logs out and exits applications
- Populate Queue – a sub-page that loads work from a source into a Blue Prism work queue (this logic could also be placed in a totally separate Blue Prism process)
- Work Pages – multiple 'work' sub-pages for navigating and updating the systems

Why use Sub-Pages?

It is easier to quickly understand what a process does just by looking at the Main Page.

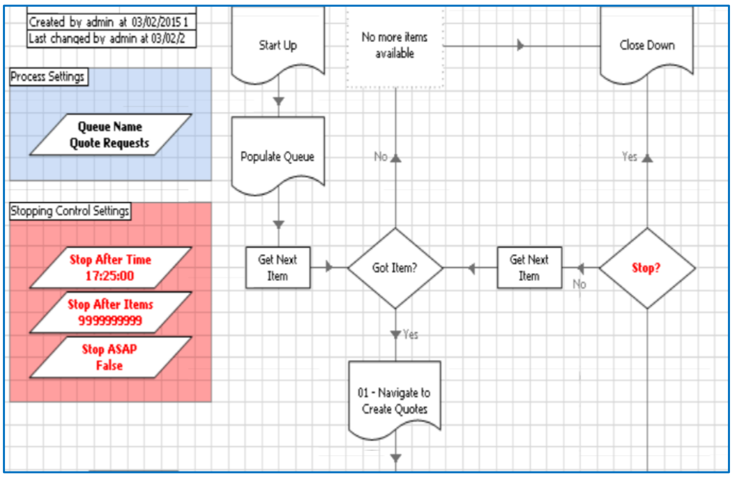
Adding Control – The Stop? decision

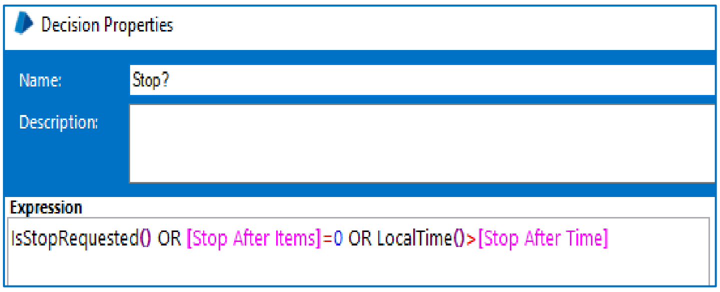
On the right is the main page of a process with a Stop? decision stage added.

The Stop? decision evaluates environment functions and session variables after each Work Queue item has been worked?

Stop? Decision session variables:

- Stop Time – a time session variable that is set to the time after which the process should stop processing work.
- Stop After Items – a number session variable indicating how many more items to work before stopping. This is useful if you want to test or run only a set number of cases.
- Stop ASAP flag – For Blue Prism version 4.2 and earlier a flag session variable to indicate if a process should stop after working the current case (superseded in version 5 by the IsStopRequested() function)





Name: Stop?

Description:

Expression

```
IsStopRequested() OR [Stop After Items]=0 OR LocalTime()>[Stop After Time]
```

Why use a Stop? decision?

The team controlling the resources can now easily alter the running of a process session from within Control Room.

Every Process should have a Stop Time, a process must never be configured to run 24/7 without stopping.

Robustness

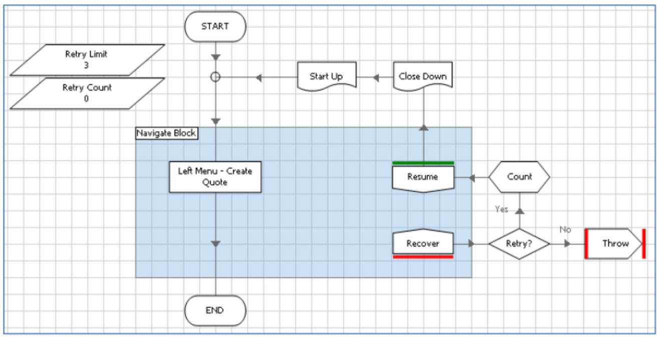
Basing your process on a Process Template ensures the implementation of best practice exception handling.

The best practice exception handling includes the following:

- Retry exception handling logic on sub-pages.
- An Exception Block on the *Main Page* around sub-pages that interface with systems.
- A *Mark Item As Exception* sub-page that terminates the process if the same system issue occurs for concurrent work items.

Robustness: Sub-Page Retry Loops

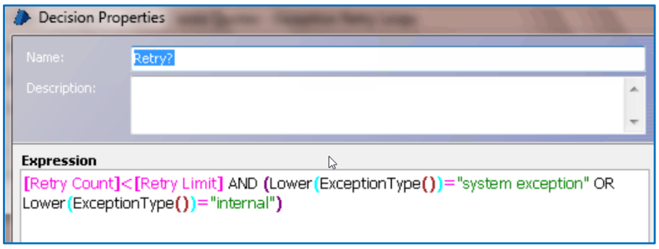
If an exception occurs on a sub-page it could be a one-off issue (i.e. a network timeout) that would be fixed if the process flow simply tried again.



Sub Page Retry Loop:

All 'work' Sub-Pages should do the following:

- Catch any exceptions with a Recover stage.
- Evaluate the exception with a Retry? decision
- If there has been less than 3 attempts and the exception is a type you want to retry, loop around and try again.
- If trying again, perform actions to 'tidy up' the system being used, in the flow on the right we simply restart it but you may need to re-navigate back to the correct system state.
- If not trying again, 'throw' or 'preserve' the exception up to the Main Page.



Decision Properties

Name: Retry?

Description:

Expression

```
[Retry Count]<[Retry Limit] AND (Lower(ExceptionType())="system exception" OR
Lower(ExceptionType())="internal")
```

Why is this better?

For one-off application errors, or systems that have reliability issues, the retry loop improves the changes of a Work Queue item being successfully worked.

Robustness: Main Page Exception Block

If an exception 'bubbles up' to your Main Page from a Sub-Page we don't want the process to terminate.

Main Page Block:

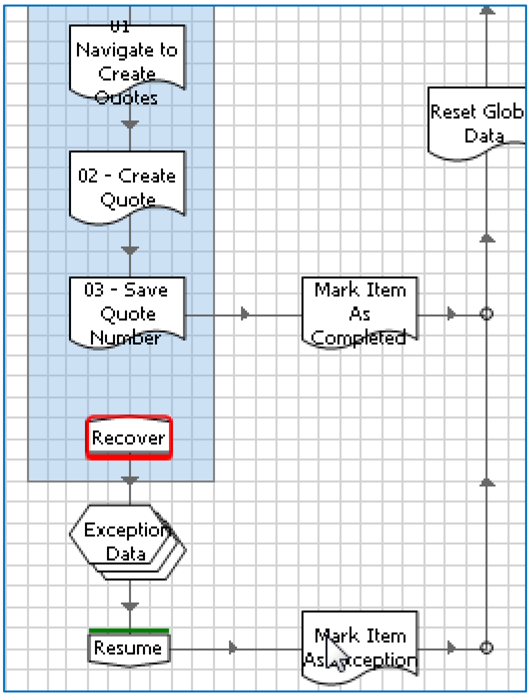
In the flow on the right we have added the following:

- A block around the main work interface sub-pages, with a recover stage.
- A Mark Exception sub-page that will contain your case exception handling logic (marking the Work Queue item as an exception).
- A Resume stage so that the flow can continue on and attempt to work the next Work Queue item.

Why is this better?

All Work Queue items should have a result set by the process, either Completed or Exception.

The process should not just terminate if one case has a problem.



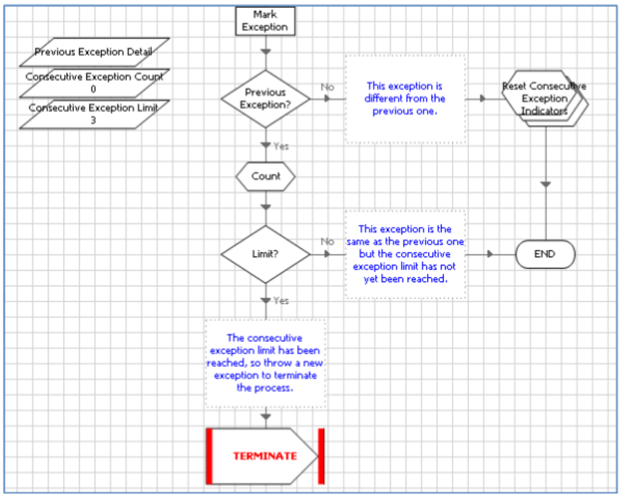
Robustness: Consecutive Exceptions

If the same exception occurs for every Work Queue item a process attempts to work, it is best to terminate the process so that a Controller can investigate the issue.

Mark Item As Exception:

The Main Page block calls a Sub-Page called Mark Item As Exception that does the following:

- Compares the current exception to the outcome of the previous case worked.
- If the current exception also occurred on the previous case it increments a counter.
- It marks the current Work Queue item as an exception.
- It Terminates the process ('throws' an exception not recovered on the Main Page) if the same exception occurs repeatedly for a configurable number of items.


Mark Exception
Previous Exception Detail
Consecutive Exception Count
0
Consecutive Exception Limit
3
Previous Exception?
No
Yes
Count
Limit?
No
Yes
Reset Consecutive Exception Indicators
END
TERMINATE

This exception is different from the previous one.

This exception is the same as the previous one but the consecutive exception limit has not yet been reached.

The consecutive exception limit has been reached, so throw a new exception to terminate the process.

Why is this better?

If a system is not available or has changed we do not want a process to attempt every Work Queue item and mark all items as Exceptions.

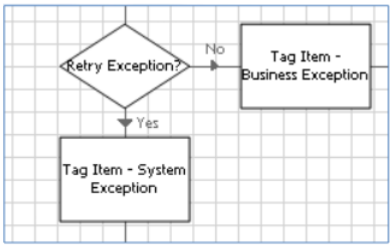
Other Process best practices

Work Queues:

All Processes must use a Work Queue. Even for business processes that are a run once linear rather than multi-case iterative, or processes that get work from a BPM worklist that manages multi-users, a Work Queue should still be used as a method of recording case time and exceptions.

Work Queue Tags:

- Work Queue tags are easily search in Queue Management and are reported on the standard Blue Prism Performance Report.
- Tags are useful to get total numbers of different work or case types that have been processed.



Work Queue Status:

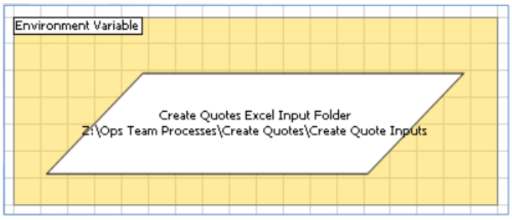
The status is a useful way of recording how far through your process a Work Queue item has been worked. Recording the status can then be used to:

- See from the Queue Management screen the progress of an item.
- If an item is to be re-worked following an exception (for example, by using the 'Force Retry' option in the Queue Management items table) the Status could be used to skip steps in the process flow that have already been completed for that item. This is especially important for multiple-update processes where some updates should never be repeatable.
- If an item is reported as an Exception to be manually worked, the manually team can use the Status to know how much of the work has been completed. This ensures that the benefit of a partially worked item is realised.

Environment Variables:

Environment variables should always be used for storing configurable information such as:

- Network Paths
- Email, database, or web service configuration
- System configuration such as website URLS


Environment Variable
Create Quotes Excel Input Folder
Z:\Ops Team Processes\Create Quotes\Create Quote Inputs

Credentials:

Username and Passwords to access systems should never be saved in the initial values of data items. System access information should always be stored in a secure and encrypted store such as the Blue Prism Credentials feature.

Process Alerts:

Ideally a Blue Prism solution should not need to be constantly monitored in Control Room to ensure it is still running without any issues.

To decrease the management your solution requires a form of Process Alerts could be built into your process to inform the Process Controller team if something is wrong. This can be as simple as sending an alert before your process terminates.

It is recommend that an organisation decides upon a preferred method of sending Alerts that is used for all processes that are developed.

Common methods of sending Alerts are:

- Blue Prism Process Alerts. These can be configured in the Security – Users are of the product. To receive alerts you need to be sat at a computer with the Blue Prism product running and connected to the environment in which the Alert was raised.
- Emails. Many clients use one of the available email interfaces to send alerts to the Controller team.
- CRM or Workflow systems. Some clients raise a support ticket in an existing workflow system.
- Other monitoring tools. Some clients have existing monitoring tools that they use to send Process Alerts. How alerts are sent will depend upon options available to interact with that tool set.

System Unavailable Exceptions:

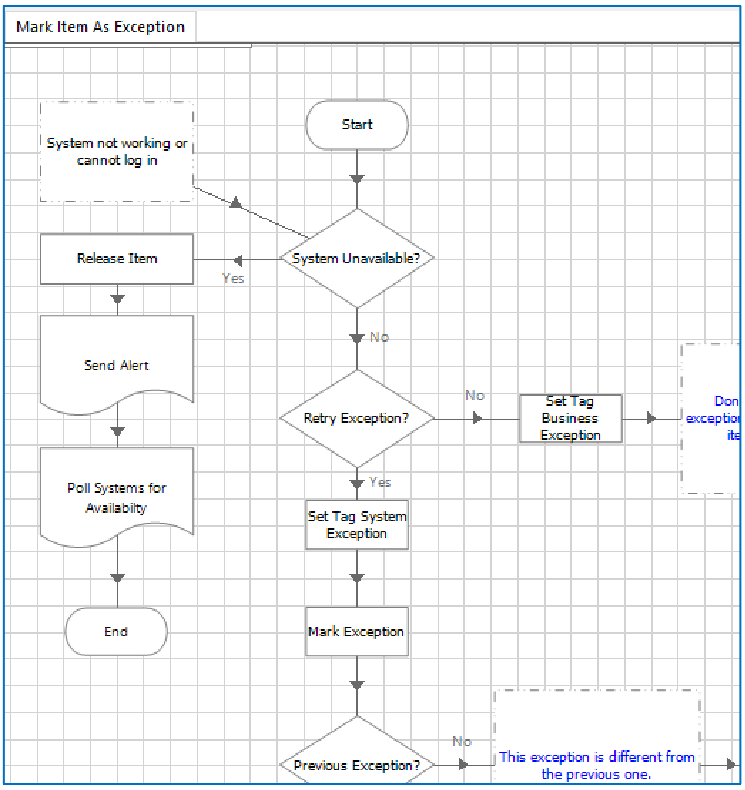
In the Blue Prism basic template, a process simply terminates if the same System Exception occurs repeatedly.

A more robust but complex option that can be implemented is to recognise if a system is unavailable and instead of terminating, send an Alert to the Blue Prism Controller team and periodically attempt to restart the unavailable system until the System can be started available again.

The System Unavailable Exception type is thrown when an application cannot be launched.

Any polling logic that periodically attempts to launch the system should include a Stop? decision to check if the Controller has requested that the process should stop or if the stop time has passed.

Your System Unavailable logic on your Mark Item as Exception page may look like the following flow:


Mark Item As Exception
System not working or cannot log in
Start
System Unavailable?
Yes
Release Item
No
Send Alert
Retry Exception?
No
Set Tag Business Exception
Don
exceptio
ite
Yes
Poll Systems for Availabilty
Set Tag System Exception
End
Mark Exception
Previous Exception?
No
This exception is different from the previous one.

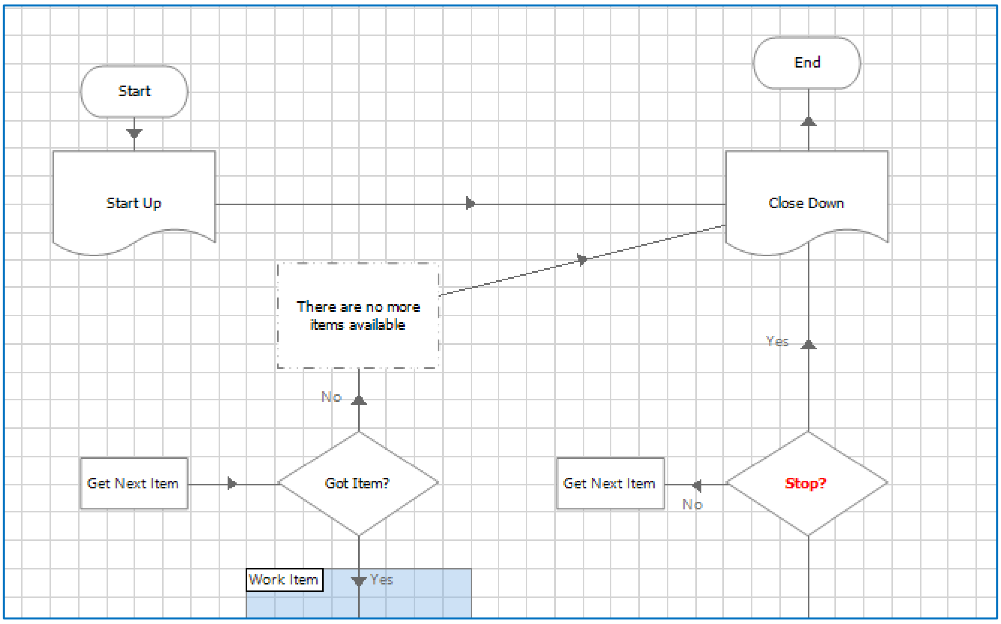
Process Build – Step 4: Test as you build

One of the most common issues raised by new developers creating their first Blue Prism solution is that "*it works in Process Studio but does not work in production when I run it from Control Room*".

This problem is almost always the result poor wait stage logic in objects and indicates that the developer has not adequately tested the solution running at full speed during the Process build.

To reduce the risk it is recommended that the developer working in Process Studio constantly tests the solution running at full speed as action stages are added. This ensures that any issues with an object interfaces are found as early as possible rather than waiting until the solution is handed over for UAT testing or Production roll-out.

For example, this image shows a process flow after only the Start Up and Close down pages have been completed. Even though only these two pages are finished the developer should run the process at full speed just to test that those two pages and the objects they use work correctly.



Once the Start Up and Close Down pages the developer will progress with a continuous cycle of adding a bit more process flow logic and testing at full speed.

Process Build – Step 5: Peer Review

Every Process built in Blue Prism **MUST** be Peer Reviewed by an experienced Blue Prism developer or mentor other than the developer that created it. A peer review is not there to undermine the ability of the developer, it simply acknowledges that we all make mistakes and an experienced second pair of eyes is always beneficial.

The review should ensure that all best practice lessons taught in Blue Prism training have been implemented, and that your own organisations internal Blue Prism conventions are adhered to (such as naming conventions, alerting methods, security policies, etc.).

Blue Prism provides the following on the Portal to support internal Peer reviews:

- Development Best Practice guide
- Peer Review Checklist

Peer reviews of development work should always take place, but they are especially valuable as part of the mentoring approach that should be in place for all new Blue Prism developers.

Process Build – Step 6: SME Verification

One of the many benefits of the Blue Prism product is its use of flow diagrams that are readable to business users and that can be easily stepped through and discussed with a process SME.

Blue Prism recommends that a verification step is included in your delivery methodology to validate that the solution that has been built actually performs as required. This verification step reduces the risk of the process definition being incorrect or incomplete.

To verify your process with an SME the following needs to be done:

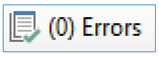
- Schedule time with an SME between completing your Process build and UAT testing
- Sit with the SME and step through your solution in Process Studio.
- Discuss each step in your process with the SME to validate it is correct. Pay specially attention to business rules and decisions, and ensure that any update screens in applications are correctly completed.
- If the SME notices anything incorrect or missing from your solution, note it down to add into your process flow later. If any major changes required the Project Manager should be informed and the changes should be added into the PDD and signed off by the business process owner.
- For large or complex business processes you may need to have multiple iterations of SME Verification sessions after you have made the suggested changes until no more changes or corrections are identified.

Process Build – Step 7: Production Readiness

Before your process can be signed off as complete you need to ensure the following:

No reported errors

Process Studio includes an error checking feature that should be used to ensure your process has no obvious errors in it. Fix any reported errors until the feature reports that there are no errors remaining.

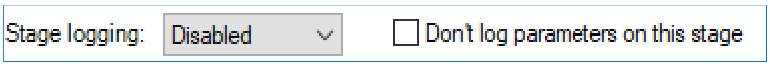


(0) Errors

Turn off unnecessary logging

Blue Prism session logging can generate a very large amount of data. Best Practice is to do the following:

- Turn off as much logging in your process as possible, only leaving enough logging turned on to be able to easy trace the route each case worked has taken through your process flow. Logging is usually left turned on for Decision and Choice stages.
- Turn off any logging on Stages that use customer data. It is important that customer data is not stored in session logs.
- Turn off logging anywhere that might generate large amounts of log data. Look for loops through large datasets or stages with lots of input or output parameters.



Stage logging: Disabled

□ Don't log parameters on this stage

Deployment Documentation

Before you can hand over your process as complete you need to ensure that all documentation required by your organisations delivery methodology have been completed.

If your solution has changed during your Process development the SDD and/or PDI documents should be updated to reflect this and the changes should be signed off.

The Robotic Operation Model area of the portal includes the following templates:

- Blue Prism Release Note Template – a sign off document to ensure the agreed methodology has been followed and permissions given for your completed solution.
- Operational Handbook Template – this is a handover document from the developer to the Controller team that is going to be running and managing the process in production.