

# Process Simulator Version History

## 2011 SP2 (December 2011) – 8.2.0.1025

### *Enhancements*

- **Resource Shift Carryover extended to Use statement** – this powerful capability, introduced in the last release, has been expanded to include resources captured with a Use statement. It enables you to carryover work started by a resource on one shift and continue it with another unit on the next shift. For example, hospitals operating 24 hours a day can transfer patient care from one shift to the next.
- **Output report views and results copied with new model** – when saving an existing model document as a different name, if that model also has saved Output Viewer report views, you will be prompted and given the choice to copy the saved report views and any results files with the new model name.
- **Charts linked in Output Viewer report views** – charts are now automatically linked together if they exist in the same report tab. This means that when you add or remove a scenario from one chart, all other charts will have that scenario added or removed as well. Other Filter Options can also be linked and, if desired, charts can be unlinked so that changes only apply to the selected chart.
- **Output Viewer Items sorted in original model order** – Filter Options now show all elements in the Items list in the order they appear in the model tables. This is now the default Item sort, however, the list can also be sorted alphabetically.
- **Move a chart and create a new Report** – if you want to move an existing chart into its own new Report tab, simply drag the chart up to the plus “+” tab and drop it there. A new Report tab will automatically be created with your chart in the view.
- **How-To modeling solutions** – learning how to use Process Simulator requires more than just becoming familiar with the product features and menus. It also requires an understanding of how to use the features to correctly create representative models of actual business processes. The how-to solutions, now included in the documentation, help you learn the techniques to model situations you are likely to encounter when doing a simulation study.
- Model package install directory defaults to where the package file resides.
- External Arrival files now support the .xlsm and .xlsb Excel file formats.
- Container objects in Visio are now supported as simulation objects.
- Output Viewer now has context-sensitive online help.
- Simulations can now be run to the year 2100.
- Entity initial cost allows use of distributions.
- Copying rows in a table supports non-contiguous row selection.

### *Fixes*

- Text on a connection in a non-simulation diagram would be replaced with percentage values during conversion to a simulation diagram.
- Process Simulator would appear to freeze up or become very sluggish if a large number was entered for resource units and “Show multiple units graphically” was checked.
- During simulation entities would not follow the defined routing connection path if data graphics were applied to the connection.
- In some cases, activity shape positions would shift in the diagram prior to simulating if they were too close to each other.
- When importing from Excel, any changes made to a Percentage routing would not properly update the numbers displayed on the connection.

- Converting diagrams to have simulation properties would remove existing custom right-click context menu items.
- The error “Out Buffer Capacity must be one of the following” would sometimes occur when trying to add a variable for the capacity of an Out or In Buffer.
- Importing from Excel would not allow variables or macros in the condition value for Detach or Conditional routings.
- In some models created in older versions, the condition operator for a Detach routing would not export to Excel.
- Default name given to Macros when added as a Scenario Parameter would be “<macro name> - Macros” and is now changed more appropriately to “<macro name> - Value”.
- A diagram containing Visio guide elements would sometimes shift shape positions prior to simulating.
- Validation on route connections would still occur in some cases even though the option for “Immediate connection validation” was unchecked.
- Downtimes for activities and resources were not using the resource priority if a resource group was selected.
- Create routes default to “After activity” when first created.
- Resources without an assigned a calendar shift would not export to Excel.
- Calendar files were not being included when creating a model package.
- Incorrect reporting of %Waiting statistics for an entity if one of multiple resources captured by an entity with a USE statement was preempted during the USE.
- A “Wait completion event not found” error was occurring when a resource attempted to execute a downtime. This was the result of multiple resources being captured by an entity and some of its resources initiating a shift carryover while others were preempted to go off shift.
- A shift carryover resource was not properly being freed if the resource it replaced on the previous shift was preempted to go off shift as it was traveling to the entity that requested it.

Includes Output Viewer 4.3.0.924 containing the following fixes:

- Output results with a long warmup period (e.g. 5 months) were plotting negative time values.
- The ribbon wasn’t displaying properly if the Windows 7 font text was anything other than 100%.
- For Table charts, Time Unit choices in the Options section of the Filter Options panel now only display if they are applicable to the table.
- Double-clicking on an RDB file that is compressed in a ZIP file would produce an error when it attempted to open in Output Viewer.
- When adding a table, if only one scenario is selected in the Filter Options, then the table is displayed with the scenario column hidden.
- Sorting a table by clicking a column header and then changing the time units caused an exception.
- Double-clicking the splitter on the Filter Options panel will collapse and expand the panel.

## **2011 SP1 (June 2011) – 8.1.0.870**

### *Features*

- **Resource Shift Carryover** – this powerful new capability allows you to carryover work started by a resource on one shift and continue it with another unit of that resource on the next. For example, manufacturing facilities that have extended task times or complex processes spanning multiple shifts or days can easily pass work from the first to the second shift. Hospitals operating 24 hours a day can transfer patient care from one shift to the next. Shift carryover works whether it’s one resource or multiple resources performing a task. Each resource will independently be interrupted to go off shift and allow resources on the next shift to resume the work. Along with this new capability, you can now assign unique calendars to specific resource units.

- **New Output Viewer time series charts** – we are excited to introduce the following new and modified time series charts:
  - **Activity Utilization** – this new chart displays utilization of activities, as a percentage of contents versus overall capacity, over the course of the simulation run.
  - **Resource Usage** – this new chart shows how many resources were used and when over the course of the simulation. Add a capacity line to the chart and compare the actual usage against the maximum potential resource usage. In order for existing models to generate this report, resources need to have Time Series selected for their statistics in the Resource edit table.
  - **Activity State** – this upgraded chart now includes the averaging of activity states across replications. It is displayed as a 100% stacked column Gantt chart over time.

#### *Enhancements*

- **Data Grouping Interval for Statistic series** – when viewing the raw data for time series charts, you can now set the grouping interval if Statistic series are added to the chart.
- **Pooling time series statistics** – Time Plot charts now have a pooling option that allows you to combine the values of the Items selected and display their joint average in the chart. Series for Statistics are also automatically pooled for all items selected and show as one joint Statistic, if the chart type has been set to stacked.
- **Macro availability** – macros can now be used in IF statements, conditional and detach routings, and pattern arrivals.

#### *Fixes*

- Renaming a scenario was not properly updating saved report views with the new scenario name.
- Scenario manager was allowing activity capacity to be set above the actual limit which caused an error during simulation.
- Scheduled arrivals set to occur on a Sunday would not actually occur until the following Sunday during simulation.
- Exporting a model to Excel would display the Simulation Properties run times and Scheduled Arrivals times as dates only and not show times.
- Exported Pattern Arrivals would import back into the application with the times to 12:00 am.
- Importing a detach routing connection would lose the condition information.
- A variable used in a Math function was not being updated when the variable was renamed.
- The drop-down list in the logic builder for selecting a subroutine would not show all characters of a long subroutine name.
- The application would sometimes lock up when the name of a variable was changed.
- Importing a numeric macro with a real value containing a comma as a decimal separator (usually for non-US regional settings), would incorrectly import the comma as a period.
- For specific models, scheduled arrivals were arriving in a different month during simulation than what was defined.
- In some cases, copying and pasting logic from one logic window to another was not saving the copied logic.
- Changing the name of a subroutine would take a long time to update.
- Resources in a model built in a previous version would disappear during simulation.
- If the simulation ended during a warmup period, the initial value for activity contents was not being reported.

Includes Output Viewer 4.2.0.830 containing the following fixes:

- A scenario containing a period “.” in the name, wouldn’t be properly displayed in the Filter Options panel.
- Series from the Statistics list for time series charts were also being stacked when the chart type was set as stacked.
- Statistics series added to time series charts when Grouping was set to None (i.e. viewing raw statistics), were not properly being calculated and, for Entity Count charts, caused an exception.
- Time plot charts wouldn’t properly display data truncation annotations if the simulation ended during a warmup period.
- Warmup period was not properly being accounted for in Entity Count time series charts when the simulation had been run as Time Only.
- Zoom capability in Histogram charts has been disabled due to a crash caused by the third-party charting component used by Output Viewer.
- The dialog for exporting chart data to Excel was not remembering the previous directory data was exported to.

## Process Simulator 2011 release (March 2011) – 8.0.0.828

### *Features*

- **Output Viewer** – originally released with ProModel 2010, the new Output Viewer was developed in the latest Microsoft WPF technology. It simplifies the creation of views, provides quicker and more open access for modifying charts and tables, and allows for analysis and comparison of multiple output data sources. The user interface follows the Microsoft fluent UI standard and uses a ribbon for providing access to all the reporting functionality. For the Process Simulator 2011 release, we have added the following new capability to Output Viewer:
  - **Sort Column, Utilization, and State Charts** – sort your chart data based on highest or lowest values. State charts will even let you choose which state should be sorted.
  - **Export Time Series Data** – similar to exporting Summary data, you can export any of your time series results from any scenario to Excel.
  - **Change Chart Type** – you can change the chart style from bar to line, from line to area, from pie to doughnut, etc. Choose from several different chart style options.
- **Independent Scenarios** – coupled with the capability introduced in the new Output Viewer, you can run new scenarios independently of each other and compare their results side by side with previously simulated scenarios.
- **Macros** – if you have a distribution that is used in multiple places throughout your model, use a macro and then if you need to change that distribution, modify it one place! Macros can be used in almost any place in your model like activity logic, routing move time, arrival frequency, etc. You can also add them as parameters to be utilized in your scenario analysis.
- **Subroutines** – if you find yourself writing the same logic in multiple activities throughout your model, put that logic in a subroutine. Then, simply call the subroutine from multiple logic locations. Not only will you reduce the amount of time writing logic, but when you want to make a change, you’ll only need to make it in one place.
- **External Arrivals** – define multiple Periodic arrivals in an Excel worksheet and have them automatically initialized in your model when the simulation runs. You can also set the arriving entity’s initial attribute values for things like part numbers, acuity levels, job numbers, etc.
- **Online Help System** – gives you access to the latest documentation...all the time.
- **Compatible with Visio 2003, 2007, and 2010!**

### *Enhancements*

- Submodel naming prefixes can be defined by including specific text within brackets in the name of the activity which references the submodel. For example, if the activity “Operation 10 – Assemble Parts” references a submodel and you want the elements in the submodel to have the prefix “s10” then you would change the activity name to “Operation 10 – Assemble Parts [s10]”. It doesn’t matter where the bracketed text is placed within the activity name.
- Entities can be Ordered or Sent directly to an activity that references a submodel.
- The Scenario Manager now contains a row called “Last Run Date” which identifies when the last time a scenario was simulated.
- Copy Model Elements from one model or submodel to another. Cut, Copy, and Paste functionality is available in the Model Elements tables. This excludes Resource Groups and Subroutines, however, you can copy the list of resources or subroutine logic and paste them into another resource details list or subroutine logic respectively.
- You can delete individual rows of logic in an IF statement using the Delete key. Previously all lines within the IF block would be deleted.
- A warning message is given alerting you to the possibility that arrivals may stop occurring for a Continuous Arrival if it is connected to an activity that either has a Calendar definition or less than 100% Availability defined.

#### *Fixes*

- Scenario names can no longer contain characters that are not valid for use in file names.
- The Digital Certificate was updated so that the VBA macro code could be set as trusted once the old certificate expires.
- In a specific case, changing a variable name was not updating the variable referenced in the model and the old name would remain.
- An entity would enter a submodel at the wrong activity if there was an explicit entry point and multiple implicit ones as well.
- An error message about only one entry point being allowed (explicit and implicit) into a model was incorrectly displayed when one explicit entry was defined and multiple implicit existed.
- Resources placed inside a Container had their graphics duplicated during simulation.
- Any text added to a Plain Graphic was considered a duplicate if attempting to use the same text for a model object name.
- When simulating a model that contained submodels, after simulation was complete you were not taken back to the model window that was active prior to simulating.
- Importing Notes from Excel back into Process Simulator was not retaining the formatting.
- Clicking Cancel in the activities Batching dialog would validate any changes and throw an error if applicable.
- Setting the clock precision to seconds in the Simulation Properties window would produce a simulation error if any activities or resources had less than 100% Availability.
- In some cases, multiple help windows would be opened when accessing F1 context sensitive help if building statements in logic.
- Capitalization of characters in scenario names was not being retained when displayed in the External Data link table for Data Graphic source data.
- If an entity was rerouted through an activity where it initially arrived, it would execute its arrival logic again.
- For Calendar Date-based simulations, depending upon how much time was specified, the Warmup time was incorrectly truncated during simulation.
- When exporting models that were created several versions ago, the Percent Availability was not exported unless you opened the properties window for that activity.
- Exporting model data to Excel 2010 as an XLS file would cause the file to be opened in protected view.

- On non-English regional settings, an error "The variable used in percent available cannot exceed 100 for its initial value" would occur if the if the initial value of the variable had decimal precision.
- When building logic using the GroupQty function, the logic preview in the dialog was not properly showing the resource name selected for the GroupQty function.
- The Simulation Object Explorer was not updating changes made to an Outlet type routing connection.
- When importing model data from Excel, if the Simulation Properties are set to Time Only, the units for Warmup Length and Run Length were not importing.
- A simulation error occurred when specifying a resource group in a GET, USE, or FREE statement and a variable was specified for the quantity.
- Mixing Scheduled Arrival types, Weekly or Calendar, in the exported model data in Excel was not being caught upon import back into Process Simulator.
- The option to apply variability to a Pattern Arrival quantity was not being exported to Excel.
- A simulation error saying that the repeat interval was less than the pattern duration would occur due to Process Simulator allowing seconds to imported from Excel for the repeat
- A simulation error would occur if a Pattern Arrival quantity was set to zero and the "Apply variability to quantity" option was checked.
- Activity properties window would not close until a batch quantity was entered, even though it was set as Rebatch which doesn't need a quantity. This was caused from Process Simulator not properly importing the model data from Excel.
- When exporting, any model element or object that started with a number was improperly getting the number removed.
- A simulation error occurred if more than one entity type had an arrival connection to the same location and the arrival connections each had a calendar file defined.
- "Unable to extract simulation data" error would occur during simulation translation if an entity was created and then additional shapes were added and grouped together.
- During simulation, attempting to zoom using Ctrl + Shift + mouse wheel was not working.
- Commenting out logic that contained object references (e.g. entities, resources, and activities) could potentially cause referencing errors even though the line of logic should be ignored.
- If Pattern Arrivals had a lot of entries in their definition, a simulation error would occur.
- A resource group was incorrectly allowed in conjunction with the OwnedResource function.
- In some cases, a resource reference in Logic would break and cause some error messages during simulation.
- On a Polish Windows OS, distributions in Process Simulator would not properly store commas as decimal places.

## Process Simulator 2010 release (May 2010) – 7.0.0.713

### *Features*

- **Microsoft Visio 2010 Compatibility** – there are so many exciting new features in Visio 2010 that Process Simulator takes advantage of.
  - **Microsoft Office Fluent user interface** – find and access the features and tools you need more quickly with a new user interface that is consistent with other Office applications.
  - **New and improved Shapes area** – the new Shapes window enables you to more quickly find and select the stencils you want, and easily move between them. Near the top of every stencil – above a faint dividing line – a new Quick Shapes area holds the shapes you want to use most often in a stencil.
  - **Quick Shapes Mini Toolbar** – add shapes without leaving the drawing page with one mouse click, using a floating window that contains your most common shapes. As you hover over the Quick Shapes mini toolbar, you are given a live preview of where the shape will be

placed. Click and drag on the blue arrow that appears and you are immediately changed to the Connector tool allowing you to create a connection to an existing shape on the diagram. This enables you to connect shapes without switching between the Pointer and Connector tools!

- **Insert and delete shapes with auto-healing** – insert new shapes into connected flow diagrams without having to move or realign existing shapes. Delete shapes from connected flow diagrams without having to delete or reconnect leftover connectors.
- **Page Auto Size** – create larger diagrams without worrying about the page size with an expandable canvas that automatically adjusts to your need.
- **Diagram Validation and new and improved Templates** – Visio 2010 has new Business Process Modeling Notation (BPMN) and Six Sigma templates. Diagram Validation ensures accuracy of your BP diagrams by checking them against the BPMN business rules and logic. The Cross-Functional Flowchart template has been completely redesigned making it even easier to insert, move and modify swim lanes, among other new capabilities.
- **Subprocesses** – easily and automatically break complex processes in diagrams into more manageable pieces using subprocesses. Select a section of shapes in your existing diagram, choose to create a subprocess from your selection and Visio will automatically move those shapes to another page in your document, replace them in the main diagram with a single shape, and create a hyperlink to the newly create page!
- **Process Simulator Ribbon** – with the introduction of the Office Fluent user interface in Visio 2010, Process Simulator now has a new ribbon that makes access to its functionality easier than ever.
- **Process Simulator Stencil** – the stencil installed with Process Simulator contains new shapes which not only help make your diagrams look more professional but also allow application of the Themes gallery.
- **Microsoft Excel 2010 Compatibility** – in conjunction with the release of Microsoft Office 2010, Process Simulator also supports importing and exporting its data to and from Excel 2010.

#### *Fixes*

- A “Do you want to add the Entity” error appeared in some cases after copying and pasting shapes from one diagram to another and then simulating.
- Variable names with mixed upper and lower case letters were not being sorted properly in variable lists.
- An error, “Unable to extract simulation data. Error: -2032465756, Invalid sheet identifier” occurred if several shapes were grouped together and then the diagram was simulated.
- RETURN statement used in logic caused a model to not simulate correctly.
- The header in the first column of the Resource Downtimes sheet of an exported file was labeled Activity instead of Resource.
- For a Detach routing, the Entity Name condition was not being imported properly.
- An error, “Failed to export. An item with the same key has already been added” occurred if shapes or connections were copied and pasted multiple times from a diagram with simulation properties to a diagram without simulation properties and then was exported to Excel.
- An ambiguous “Failed to export. Object name not found” error was thrown upon exporting to Excel when a hyperlink reference to a file that didn’t exist was encountered.
- The application would crash upon exporting to Excel if an entity had somehow got into a state where its internal properties were referencing itself.
- Arrival connections with a Calendar assigned , a Start Time defined as zero (i.e. the first arrival occurs at the very beginning of the simulation), and an Interval defined such that entity arrival times coincided with the Calendar starting up again would sometimes prevent arrivals from occurring.
- On a computer running a 64-bit Operating System, if a model contained a Storage type activity, the building and translating of a model would take an exceptionally long time or else the computer would lock up and require a hard reboot.

## 2009 SP2 (November 2009) – 6.1.1.533

### *Fixes*

- Calendar files only specified in Arrivals would not be included when creating a package.
- Upon simulating, a compiler error stating “Two consecutive math operators encountered” would occur if a Conditional route had been imported from Excel.
- A variable could be deleted even though it was being used in the Units field for a resource.
- A Failed to Export error stating a “String cannot be of zero length” would occur when exporting a model to Excel with a “GroupQty()” (no name within the parentheses) function in Activity logic.
- Numeric values using commas as a decimal separator (non-US regional settings) were not being correctly exported to Excel for several simulation properties.
- If any invalid data was entered in Simulation Properties fields in Excel and then imported, the Import Errors window displays the incorrect row number.
- If invalid data was entered in the Simulation Properties – End Date field in Excel and then imported, the Import Errors window would specify that the data should be a “Time of Day” instead of a “Date.”
- In some cases, models built in version 5.3 were not able to have their variables or attributes deleted if they were referenced in Activity logic.
- Variable graphics would increase in size following a simulation run if a model referenced submodels in a separate VSD file. This did not occur for submodels within the same VSD file as the parent.
- When right-clicking on a column header in the Six Sigma Configuration dialog, an unhandled exception would occur and close the dialog.
- If themes were applied to the document, a background encompassing the entire diagram would appear during simulation that was the color of the theme.

## 2009 SP1 (August 2009) – 6.1.0.527

Upgrading from Process Simulator 2007 (version 5.x) to Process Simulator 2009 SP1 (version 6.1) requires an Upgrade Serial Number (USN) in order to run the software. Upgrading from version 6.0 to 6.1 will not require a USN. If you know you will require a USN or are prompted for one, please contact your local ProModel sales representative or ProModel technical support.

Service Pack 1 supports additional language operating systems (German, Portuguese, and Spanish) of Windows XP and Vista and Microsoft Office Visio 2003 and 2007. In addition to several fixes, SP1 contains the following new features:

### *Features*

- **Pattern Arrivals** – a new arrival connection type allowing for a cyclical entity arrival definition. It is a user-defined pattern of varying quantities spread over a specified period of time. It can be used, for example, to model fluctuating customer arrivals over the course of a day or week.
- **Arrivals adhering to a Calendar definition** – a Calendar can be assigned to an arrival and will prevent entities from arriving at the activity during a holiday, vacation day, or off-shift period of time. For example, if a periodic arrival is defined to repeat every day, assigning a calendar containing holidays, vacation, and no work to be done on the weekends will prevent the daily arrivals from occurring on the days off.
- All object property windows have been expanded to allow for more space in displaying the properties.
- Detach routes now have the same conditional options as Conditional routes.

- Added a right-click menu to the Scheduled arrivals grid with copy, paste, and delete options.
- The Scheduled arrivals grid can now be sorted, which is accessed through the right-click menu.
- The Attach quantity limit has been increased from 999 to 999,999.
- Improved responsiveness of panning during simulation.
- The new License Manager is included with this release.

#### *Fixes*

- In some cases, activities in a submodel (on another page in the same document as the parent model) were not being linked to their data records in the External Data window.
- Resources and entities in a submodel (on another page in the same document as the parent model) that were not defined in the parent model were not being linked to their respective data records in the External Data window.
- Some of the shapes in the Process Simulator stencil could not be assigned data graphics without first grouping the graphics that make up the shape.
- The Index in the Process Simulator User's Guide had incorrect page references for some of the topics.
- Activity Multi-Entity Priorities were not being imported.
- Canceling the simulation during translation would sometimes cause the error "Error #91 creating graphic library: Object variable or With block variable not set."
- To reflect how the simulation runs in weekly time, Sunday is now listed last in all day of the week lists.
- "Error: Unable to extract simulation data, Error 5, Invalid procedure call or argument" would occur if a resource group was specified in the FreeUnits function. Resource groups are not allowed.
- A resource graphic could be incorrectly duplicated if the translation was canceled after the simulation was initiated.
- Changes to object properties were not saving if the change was made and then immediately followed by running the simulation.
- A model would fail to export if it had an activity with no time defined and then a scenario parameter of that activity's time was listed in the Scenario Manager.
- A resource shape placed as the left-most shape in the diagram would cause a misalignment during simulation.
- You are no longer prompted to trust the publisher or change your Visio security settings after first installing Process Simulator.
- Changing the text color in ProModel would cause text color to change during simulation in Process Simulator.
- Importing an invalid value into the Scenario Manager from Excel would cause all parameters to be reset to their base values rather than retain their modified values.
- The Simulation Object Explorer and Model Elements windows were not being refreshed when switching between pages in the document.
- A "Run-time error '381': Invalid property array index" message would sometimes appear when increasing the column width beyond the Model Elements window boundaries.
- "Object reference not set to an instance of an object" error would occur when attempting to import from Excel where the Resource Group quantity was blank.
- A resource downtime definition specifying to use itself during the downtime was not causing an error to be thrown when imported from Excel.
- An "Internal Error" would occur if no external data was selected to be collected in the Visio External Data Customize dialog accessed from the Simulation Properties.
- Notes for a Scheduled arrival were not being imported back into the diagram.
- Not all the data in the Scheduled arrival table was being copied when attempting to copy the entire table.

- A misleading "Must be one of the following: Number greater than or equal to 0, Distribution, Variable" error would occur if an improper or misspelled time unit was added to an activity time.
- The simulation property to launch the 3DR Output Viewer was always being checked when importing from Excel.
- Text boxes were causing the animation to be misaligned with the diagram during simulation.
- No error was occurring when importing from Excel alerting you to the fact that the Quantity column for a Buffer activity was blank.
- "The file is being used by another process" message would appear in some cases if both 3DR and Visio External Data were both selected to be launched after simulation.
- The application would crash at the end of simulation if it ended when an activity or resource was on vacation, holiday, or other time off.
- In some cases, a resource sharing the same calendar as another resource would never go off-shift or otherwise adhere to the calendar assigned to it.

Includes 3DR version 2.0.14.106 containing the following fixes:

- The hotkey to invoke the Histogram creation dialog was Ctrl+V and conflicted with the standard Windows hotkey to paste contents from the Clipboard.
- Failed arrival records showing zero failed arrivals no longer are included in the table.

### Process Simulator 2009 release (April 2009) – 6.0.0.438

#### *Features*

- **Data Visualization with Data Graphics** – the most exciting new feature is how Process Simulator takes advantage of Data Graphics and External Data linking in Microsoft Office Visio 2007 Professional. With External Data linking, you can directly connect your simulated results to the shapes in your diagram and visually display them with Data Graphics. Imagine being able to view your Activity Utilization on the actual activities in the diagram or have the activities change color based upon the value of the Utilization. Next imagine taking this same visualization and applying it to multiple scenarios so that the results are displayed and easily compared together on the diagram! With this kind of visual analysis you can more clearly see the results of your changed inputs and make better decisions faster in determining optimal solutions.
- **Export/Import to and from Microsoft Office Excel** – model information is exportable to Excel not only to view it all in one place but also to modify it and import it back into Process Simulator. Model building and management is easier than ever before.
- **Calendars** – definition of shifts and time off (holiday, vacation, etc.) for activities and resources is now done using a new .NET calendar program called Calendar Editor. It provides a more accurate and intuitive way for scheduling resource and activity availability.
- **Enhanced Scheduled Arrivals** – individual arrival definitions now have the capability to be repeated, which can significantly reduce the number of arrival definitions. And with the introduction of Calendars, your scheduled arrivals are also definable by a calendar date.
- **Simulation run length by Calendar Date** – with the introduction of calendars, we are also bringing you the capability to define your simulation warmup, start, and end dates by calendar.
- **Adjust for Daylight Saving Time** – because you can now run your simulation by calendar date, we enabled the ability for the simulation to account for daylight saving time. Based on the regional settings of the computer running the model, choose whether or not to account for daylight saving.
- **New Licensing Wizard** – Process Simulator now uses the latest .NET licensing component making it more intuitive to license and register.
- **New Auto-Update** – Process Simulator now uses the latest .NET auto-update component making it both easier and more intuitive to get updates to your software.

- **New Windows Installer technology** – Process Simulator now installs using the standard Windows Installer technology. Microsoft encourages the use of Windows Installer framework so that install programs synchronize correctly with other installers and keep the internal database of installed products consistent. This means that Process Simulator installations should be more robust and compatible with Windows operating system standards now and in the future.
- In Scenario Manager, the base scenario “Base Values” can now be modified to whatever name you want. Simply double-click on the name of the scenario to change it.
- Access the Calendar Editor from the Process Simulator menu and toolbar.
- Calendar files are automatically loaded into the Calendar Editor when launched from the Calendar Selection dialog (formerly the Shift Selection dialog) for activities and resources.
- Added a right-click menu in the Scheduled Arrivals grid so that it is more obvious that Cut, Copy, Paste, and Delete functions are available.
- Added right-click menus containing a Delete option in the grids for variables, attributes, resource groups, downtimes, multi-entity, batching, etc.
- Clicking on a row header in the Scheduled Arrivals grid now highlights the row. Previously, only clicking on a cell in the row would highlight the entire row.
- In the GroupQty() system function, the entity name is now optional. Previously, if multiple entity types were batched or attached, only the total for the entity specified in the GroupQty was returned. Now the total for all entity types batched or attached can be determined.

#### *Fixes*

- The error "Unable to extract simulation data. Error: 5, Invalid procedure call or argument" was received when simulating if a resource had parentheses in its name and it was used in a system function (e.g. "GetResRate(Worker(23))").
- Received a "Failed to rebuild references" error when loading an older model that contained multiple pages.
- A reference for a variable used in the Resource Units field was not being created, which would result in the variable being allowed to be deleted without removing the variable from the Units field first.
- An error message was received and had to be clicked 31 times before it would go away if the capacity of an activity was changed to something greater than 1 and there was at least one item in both the Multi Entity and Setup tabs.
- Resolved an issue where an entity couldn't be deleted because it had a reference to it that didn't actually exist. This was associated with a Conditional or Detach routing where a variable or attribute was used in the condition.
- In Windows Vista there was an issue where the text (Scheduled, Unscheduled, or Usage) in the Basis column for an Activity Downtime appeared blurry.
- An error message occurred when clicking on the “Format Painter” on the Visio Standard toolbar.
- The default parameters for a Normal distribution were a mean of 5 and a standard deviation of 10. The standard deviation has been changed to a more appropriate value of 1.
- Simulation Object Explorer was not updating when switching between two or more open models.
- In some cases if Process Simulator was minimized during simulation it could not be restored until the simulation was complete.
- Editing the week value of a new scheduled arrival and then clicking on the Notes tab would cause the application to crash.
- In the Properties window, the order in which moving from one field to the other, using the Tab key, was not following an expected sequence.
- The tab key would not take you from cell to cell in the Weekly Time grid in Simulation Properties.
- The Frequency for a Storage activity triggered by Time was not properly updating during simulation if used as a parameter in Scenarios. Also, the time unit for the Frequency in the Base scenario was always set to Min even though it might be set to something else in the Properties dialog.
- In some cases, removing an element from an IF statement would cause the Logic Builder to fail to

reopen until Process Simulator was restarted.

- Modifying an IF statement by changing an Operator to blank (if it previously had an AND or OR) would create a blank row in the IF statement grid that could not be deleted.
- A blank activity time was being translated as a WAIT 0 for the Base scenario which caused it to run differently than the normal run and they are supposed to simulate the same.
- <None> was removed as a choice for the Priority field for Multi Entity, Setup, and Downtimes.
- In some cases, the font of the text for the Route to Exit statistics was being changed from the default.
- Choosing Unbatch, Rebatch, or None for activity batching was disabling the Quantity field but not clearing out the value which, even though the value was not used, was a source of confusion as to whether or not it was using it since the value could still be seen.
- Views during simulation were not panning and zooming to the appropriate diagram. This issue was magnified when the model had several submodels.

Includes 3DR version 2.0.13.104 containing the following fixes:

- Changing the value of the Average/Total data by period for an existing time series plot would reset the custom zoom settings without being warned.
- Placing a ":" in the name of a View prevented the saved view from being displayed and if deleted would cause 3DR to crash.

### **5.3.1.336 (February 2009)**

#### *Enhancements*

- Drawing scales in Visio other than just 1:1 are now supported in Process Simulator.
- The Process Simulator stencil now contains a Multi-Cap shape which looks like the General Activity shape but has the simulation properties of "infinite" capacity for the activity with no buffer capacities defined.
- The default properties of the Decision shape in the Process Simulator stencil have been modified so that the capacity is "infinite", the buffers have no capacity, and there is no activity time.
- Clicking on "Convert to Simulation Model" will now search the active simulation document for any shapes that do not have simulation properties and then add them.

#### *Fixes*

- Clicking on the "Attach to" list box for an Attach routing would revert to selecting "Selected Entities Only" even though the original choice was "Any Entity" or "Creator".
- A simulation translation error would occur if a blank line in any Logic window was commented out. The error message was similar to: "Error 'Compiler Error' Context: Process: For All Entities at Activity\_:Operation line 1 Source /"
- The Keep checkbox was not remaining checked if immediately after checking it, another tab in the Activity properties window was clicked on.
- References to variables were not being properly tracked if the variable name did not have the exact case for each character in the name (e.g. ThisVar1 vs. thisvar1).
- References to variables were not being tracked in some places where the variable could be used (e.g. Activity Multi-Entity time, Activity Setup time, Storage Trigger Level, etc.). This could result in the variable being deleted without a prompt to remove or replace the instances in the model where the variable is used.
- Adding a second percentage routing to an activity was not properly changing the first routing percentage to 50%, which caused an error on both routing connections.
- Simulation properties would stop being added to shapes after a routing connection was added and

then removed by using the Undo while the simulation properties window was open.

- If a shape is encountered that does not have simulation properties, properties will now be automatically added.
- Simulation properties would stop being added to shapes after changing Resource Units, closing the properties window, and then undoing the action.
- In some cases on computers with non-US regional settings, the Permanent Attach option was not saving when checked.
- A downtime was inadvertently being added to an activity if that activity was double-clicked on in the Simulation Object Explorer, which opens the activities properties.
- Undo would stop working in Visio when a shape was copied and pasted.
- In some cases Redo in Visio would stop working.
- When the same shape is added to the layout two or more times the default naming convention was "Shape", "Shape 1", "Shape 2", etc. Now the naming convention follows "Shape", "Shape 2", "Shape 3", etc.
- Simulation properties were not being added to a shape when placed on the layout if that shape had been previously saved to a stencil from the layout with simulation properties. Note: simulation properties are deleted when a shape is added to a stencil. Process Simulator does not currently support the saving of simulation properties with a shape added to a stencil.
- "Must have at least 1 entry for scheduled arrivals" error would appear 33 times if all scheduled arrival details were deleted and then another action was attempted like selecting another shape.
- The purchase button on the licensing and registration window was pointing to a non-existent web page.
- "The capacity must be larger than the initial level" message would appear 37 times after entering an initial level for a Buffer activity that is greater than the capacity. It now only appears once.
- "Value must be a number greater than or equal to zero..." message appeared 37 times after entering text, for example, in a numeric-only field of the Multi-Entity, Setup, or Downtimes tab for an Activity or Resource.
- "Unable to extract simulation data. Error: 5, Invalid procedure call or argument" error occurred when a resource group was defined in a submodel but not in the main model.
- The User Guide had references to other ProModel products names instead of Process Simulator.

Includes 3DR version 2.0.12.103 containing the following fixes:

- Total time in use is now collected for Resources and is reported as Work Time.
- Chart properties like the zoom or x axis time unit were being automatically reset when modifying the chart items. Now you are prompted whether or not to reset the chart properties.
- When running multiple replications, an informational or warning message will appear if data in a Time Series chart (Time-weighted, Simple, or Counts) is truncated to match the replication with the shortest run length. If all replications have the same run length, no data is truncated.

### 5.3.0.319 (October 2008)

#### *Enhancements*

- **Permanent Attach** – if you are attaching entities to a base entity and never intend to detach them later on (i.e. in an assembly type of activity), then using the permanent attach feature is the recommended approach. By permanently attaching entities, cost statistics will be appropriately passed to and reported by the base entity.
- **Simulation precision** – you now have the ability to choose the simulation clock unit precision in Simulation Properties. This helps resolve an issue seen during the simulation where activity times were shorter because they were defined in seconds.

- **New Shift Editor** – the Shift Editor has been completely rewritten in .NET. You can more quickly define your shifts and breaks in an easier to use interface.
- **Latest simulation engine files** – this version contains the ProModel 7.5 simulation engine files.
- **Zooming during simulation** – Functionality for one-click zooming, zooming to a selected region, and mouse wheel zooming has been implemented or updated.
  - **Ctrl + Shift + Left-click** – zoom in
  - **Ctrl + Shift + Right-click** – zoom out
  - **Ctrl + Shift + Left drag** – draws a region (or “box”) to zoom into
  - **Ctrl + Shift + Mouse wheel scroll** – zooms in and out
- **Panning during simulation** – Functionality to click and drag the layout to pan to different areas of your model has been implemented and improved.
  - **Ctrl + Shift + Right drag** – pans the layout

#### *Fixes*

- The error “Run-time error '381': Invalid property array index” was received when copying and pasting logic from one activity to another when the logic contained two or more local variables.
- A Continuous arrival connection would stop producing continuous arrivals if the entities were batched at the arriving activity.
- Too many exits of a particular entity were being reported if that entity arrived at an activity (through an arrival connection), created more than one other entity type through a create routing, and then exited the system implicitly (i.e. there was no route to exit connection defined at the arrival activity).
- The error “File conversion error in ‘Getting Entity Activity Data’ section of the file...” was sometimes encountered when attempting to view simulation results. This was due to changing from one entity type that is collecting statistics to another entity type that is not collecting statistics.
- In Windows Vista, the user specific working directories were not properly created for all other users of the computer except for the user who installed the software.
- Sometimes during simulation, the scale of the shapes and connections were huge while the animation of the resources and entities were on a smaller scale.
- Entity and resource graphics appeared smaller during simulation.
- A package file could not be installed if the path to the package file was greater than 128 characters.
- If an activity had two or more routes to Exit, each was listed with the same name in the Add Analysis Item dialog accessed from the Six Sigma Configuration window.
- When opening the Scenario Manager, a runtime error 457 was thrown. This was caused from two objects having the same internal unique ID.
- Resource units would not update properly when changing the number of units and then switching to another page in the Visio document.
- Attempting to generate Six Sigma reports in Minitab, on a non-English OS or with a non-English version of Minitab, was failing and giving an error, “\*ERROR\* Illegal Sequence arguments.”
- Using the same local variable name in the logic of two or more Ordered arrivals to the same activity would generate a simulation compile error stating, “The identifier is already in use.”
- There was a way to define entities, activities, and resources with blank names, which would cause errors when simulating.
- Entities would stop taking the second of two routes out of an activity, if the entity was given a new name for the second route and there was a Continuous arrival coming into the activity.
- Copying Activity, Arrival, or Routing logic from one document (or page) to another was not warning the user that references to Activities, Resources, Entities, Variables, or Attributes in the logic would be lost and must be reassigned for each statement that might use one of these model elements.

- The error "Unable to extract simulation data error 9" was occurring when a model built in version 5.1 with variable counter graphics was simulated in version 5.2.
- In a specific case, the error "Run-time error '13': Type Mismatch" occurred when attempting to open the Variables and Attributes dialog.

Includes 3DR version 2.0.11.93 containing the following fixes:

- When modifying chart items to add or remove series in an existing chart, the titles in the chart were being reset to their default formatting.
- When changing the decimal precision, the chart title was being reset to its default formatting.
- In Windows Vista, scroll bars in reports and charts were being clipped so that they were only partially in view.
- 3DR would throw an error and not load the statistics RDB file if the path and filename were longer than 126 characters.

### 5.2.0.312 (April 2008)

#### *Features*

- Six Sigma analysis with integration to Minitab

#### *Fixes*

- Resolved the "The digital signature has expired" warning where the Process Simulator macros are disabled upon starting the application.
- In some cases, pressing F1 to access Help would bring up duplicate instances of the html page in Internet Explorer 7.0 and Firefox tabbed web browsers.
- Many shapes in the stencils included with Process Simulator were not entering text edit mode when double-clicking on them.
- Many shapes in the stencils included with Process Simulator were allowing individual pieces that make up the entire shape to be selected and moved.
- Uninstall more thoroughly removes remnants of the Process Simulator install on Windows Vista.
- An error occurred when attempting to license the Lite version from **Help | About**.
- Apostrophe and Tab characters in activity names were causing simulation compiler errors.
- In a specific case an error would occur when opening the Variables and Attributes window.
- Redundant tooltip text for the Pointer and Hyperlink icons in the Process Simulator toolbar was being added each time a document was opened and closed thus causing the tooltip textbox to extend off the screen.
- A Resource group could be selected to Move an entity but it wasn't used during simulation.
- The Process Simulator license agreement PDF document is installed with the software.

### 5.1.2.141 (February 2008)

- Output buffers were being added to all Activities when running scenarios.
- A Break Loop statement contained in an If-Then statement that is nested in a While Do loop was improperly marked as an "invalid use of the statement".
- Using the GroupQty function in an Assignment statement was causing an error at model translation (to resolve this, you must delete and then recreate the statement in Logic).
- If an Activity name started with a number, the first character in the number would be removed when simulated.

- The number pad in the Logic Builder now has a comma “,” for the decimal separator when the computer regional settings are set to use commas.
- The position of an Outlet routing was being reset in the Simulation Object Explorer when any of its properties were modified.
- In a specific case, attempting to delete a variable in Activity Logic would give an “Error 5 invalid procedure call or argument” error.

#### **5.1.1.140 (December 2007)**

- In the Scenario Manager, using a semi-colon “;” (for some computer regional settings) as a parameter separator in a distribution was causing a simulation error.
- If more than one shape in a Visio document had the same name, when converting it to have simulation properties the variables and attributes table would not open.
- If a shape was deleted while the Properties window was open, Undo would become disabled until Visio was restarted.
- The length of the path and filename specified for a Shift file was limited to 125 characters and has been increased to 244.
- Lines of logic would end up in the inverse order when copying and pasting within the begin and end brackets of an IF or WHILE statement.
- The opening of the Scenario Parameters selection window was optimized to show more quickly.

Includes 3DR version 2.0.8.89 containing the following fixes:

- Changing the name or “alias” for a chart series in a saved View was not persisting after the View was closed, reloaded and resaved.
- The starting point for bucketing values in a Counts Time Plot chart was based on the first data point in the series rather than zero (or the warmup end time).
- The line width and style of a series in an existing chart, if changed, was being reset when adding or removing series from the chart.
- Saved views were not persisting when first created (i.e. the IVD file was not generated) in the case where 3DR was left open and a simulation was started (which triggers 3DR to be automatically closed).
- The General table in the General Report was coming up blank if a saved view contained a Failed Arrivals table but the simulation generated no failed arrivals.
- Colors were incorrectly displayed in a State Values Time Plot chart containing series from multiple scenarios if the chart was part of a saved view and the model was resimulated with one of the scenarios disabled.

#### **5.1.0.132 (May 2007)**

##### *Features*

- Scenario management has been simplified by consolidating the two separate windows into one easy to use table.
- Attach route has been enhanced to allow selection of specific base entities to be attached to.
- Average Cycle Time variable has been added to explicit Route-to-Exit connections where Total Exit variables were previously solely displayed.
- Supports Visio 2007!
- Supports Windows Vista! (32- and 64-bit versions)

#### *Fixes*

- Adding a Resource shape from the Process Simulator stencil to the layout was not properly having simulation properties added.
- Adding a shape from a non-Process Simulator stencil was not properly having simulation properties added.
- A new folder was not being created when installing or creating a model package containing an authenticated UNC path.
- In some cases, changing the number of units of a Resource and then changing focus from the properties window would cause some internal errors.
- An entity request for multiple resources using a GET JOINTLY statement was not being fulfilled in a situation where the resources were not initially available but later became available.
- The events list in the simulation engine was not properly clearing out after each replication which resulted in unnecessary memory accumulation.
- The percent availability for an activity or resource during simulation sometimes would be completely different than what was defined.
- Resolved the expired security certificate error which would prevent the use of Process Simulator.

#### **5.0.2.110 (November 2006)**

- In some cases a shift file was inadvertently being modified during model packaging.
- Custom stencils were not being properly created when the Process Simulator stencil was open.
- When the regional settings on a computer were set to use a 24 hour clock, scheduled arrivals could not be created for times above the 12<sup>th</sup> hour.
- Activities were being listed as valid choices for the FreeUnits function in Logic.
- Improved the warning message that appears when more than one entry point is defined in a submodel.

Includes 3DR version 2.0.6.85 containing the following fixes:

- In a specific case the order of variables listed in the statistics table was not matching the order they were listed in the application.

#### **5.0.1.108 (October 2006)**

- An entity that was created through a Create route and then later renamed through routing would not attach to its original creator.
- In a specific situation the process diagram graphics were not synchronized with the animating entities during simulation.
- Logic functions pertaining to Activities, Storages, or Buffers when used in sub models were producing simulation errors.

Includes 3DR version 2.0.5.84 containing the following fixes:

- Warmup time was not being properly displayed for a Time Plot State Values chart.
- Time Plot State Values chart was showing an Activity's state as Empty/Idle instead of Waiting while in an ATTACH state.

#### **5.0 Release (July 2006) – 5.0.0.104**

## Features

- A new activity type, called a Storage, replaces the Order Signal and simplifies and extends your ability to model entity reordering (triggered by level or by time).
- Multiple Storage activities can be connected together to create a Lean Supermarket object.
- A new SEND statement can trigger the release of entities to an activity via a Send route (formerly called the Ordered route).
- A new activity type, called a Buffer, allows entities to be queued by LIFO, FIFO, or by entity type.
- A Buffer activity also allows you to define batching quantities by specific entity types.
- Unique processing times and resource requirements can be easily defined for multiple entity types at an activity.
- Machine Setup (or changeover) is definable for activities.
- Scheduled-, Unscheduled-, and Usage-based downtimes can be defined for resources and activities.
- The Attach route has a new option which allows you to attach whatever quantity exists (the exact amount specified for the Attach or fewer) and immediately continue on.
- You can now have multiple Create routes at the same activity.
- Simulation event tracing and logic debugging capabilities during run-time have been added for improved model troubleshooting and verification.
- Percentage routing validation requires route connections to add up to 100% and the percentage value can be modified directly on the routing connection.
- Resources can be assigned to groups which in return allows for easier resource selection and unique statistical reporting.
- Initial animation speed can be set in Simulation Properties prior to running.
- Undo has been improved and optimized.
- More stencils have been added.
- Model Packaging allows you to collect and compress all the files associated with a model into one file (all Visio diagrams, shift files, and 3DR saved views files) which then can be easily shared with others.
- The Logic Builder has been enhanced to allow for easier logic definition including the ability to enter numbers directly into fields. Less mouse...more keyboard.
- Simulation Object Explorer has an option to auto scroll the layout to view the object selected in the window.

## Fixes

- A space at the end of a Scenario name caused statistical collection to fail.
- A scenario parameter is no longer allowed to have the same name as another parameter.
- In a particular case, a variable graphic and its label would become disconnected.
- In some cases a graphic for a resource would appear thinner during runtime.
- Changing the value for resource units and then clicking on the layout would create the correct number of resource graphics but label them incorrectly.
- When pasting data into a scheduled arrival record an "invalid data" error would occur and the value for Week would be set to 1 regardless of its true value.
- Current cell selection is more easily recognizable in the scenarios and parameters grids.
- Removing a scenario parameter from the list when that parameter had its user defined range selected would cause PCS to crash.
- If an activity had Availability defined by percent or time and that activity had a continuous arrival, in some cases the arriving entities might stop.
- Once a main routing type (Percentage, Conditional, Send, or Attach) is connected from an

activity, the next new routing connected from that activity will be of the same type as the first. Previously, a new route connection would always be created as a Percentage type routing.

- Line color of connection lines can be changed while still enforcing PCS connection style.
- Double quotes in the alias name of scenario parameters caused errors.
- A type mismatch error occurred if text was entered into the user defined range of a scenario parameter.
- If an activity's In or Out buffer capacity was defined as infinite, they wouldn't show up in the scenario parameters list.
- Automatic spacing between resource unit graphics was inconsistent depending upon how the number for units was entered.
- The "Finished Goods" connector in the Value Mapping stencil would animate the entity movement during simulation in a strange way.
- Variables and Attributes are now listed in the right-click menu for activity Duration.

#### **4.2.2.70 (May 2006):**

- Value stream mapping stencil had an expired digital certificate.
- PCS licensed with a hardware key sometimes crashed when the simulation was run.
- Simulation engine files updated to 7.0.5.207.

Includes 3DR version 2.0.2.79 containing the following fixes:

- A manual change to the Y-axis value of a Time Weighted Time Series Plot was not persisting in a saved view.
- Values using a comma as decimal point when the computer regional settings are defined to handle a comma were being saved with a decimal point.
- Views saved in German regional settings did not open correctly in English regional settings.
- Axis range values changed in Time-weighted Time Series Plots when the time unit was set to anything other than hours were not persisting in a saved view.
- An error occurred when using a comma as a decimal in the value specified for the bar width of a Time Series Histogram.
- Changes made to chart properties were not persisting when selecting or deselecting a series element in the Display & Alias window.

#### **4.2.1.69 (April 2006):**

- Digital Certificate has been updated so an expired message no longer appears.

#### **4.2.0.68 (March 2006):**

- PCS model version added to VSD file.

Includes 3DR version 2.0.1.77 containing the following fixes:

- Changing the position of an object (variable, entity, etc.) in its corresponding table breaks any saved views containing that object.
- 3DR does not load properly if it was previously closed when minimized.
- "Value History" text is appended to the name of a variable if the word "Contents" is at the end of the variable name.
- A tooltip displaying "Y axis" incorrectly appears when the mouse hovers over the X axis in the Time Series State Plot
- State Charts do not show all percentage values when displaying Point Labels.

- Graphic color on the end of a bar in a State Chart is gray.
- In some cases, the order of variables listed in the General Report is inconsistent with the order in the model.

#### **4.2.0.67 (February 2006):**

- Updated the simulation engine files to ProModel version 7.0
- Optimized a PCS routine so that simulations should be slightly faster
- Fixed an issue where an order signal would add an extra arrival record which resulted in a simulation error

#### **4.1.0.63 (February 2006):**

- Days of the week are now listed Monday through Sunday in the Simulation Properties and Scheduled Arrivals dialogs so that it is consistent with the start of a week (Monday instead of Sunday) during simulation.
- Wrong names in the column headers of the Scoreboard have been fixed.
- When saving views, changes made to chart and table properties were not persisting.

#### **4.1.0.60 (January 2006):**

- If Resource Percent Availability was less than 17%, a run-time error would appear during simulation.
- Run-Time Error when checking the Input to Submodel option in the Arrival Properties dialog.
- Order Signal arrival logic was not enabled and Order Signal arrivals were not generated in the correct order.
- InInventory statement would update the wrong activity in some specific cases.
- Using the "day" time unit for a scenario parameter would cause the box to not be edited again properly and the day wouldn't get saved to the Visio file. So when you simulate, the day time unit would not get translated over to the MOD file.

### **4.0 Release (May 2005) – 4.0.0.48**

#### *Features*

- Hierarchical Modeling!
- Support for limited-access and multiple user accounts on Windows XP and 2000
- Improved support for Windows regional settings
- Multiple levels of Undo/Redo in the Logic Builder

### **3.0 Released (July 2004) – 3.0.0.81**

#### *Features*

- Renamed to Process Simulator
- Added a distribution builder to assist in defining statistical distributions
- Added right-click menu access to Distribution Builder and list of variables and attributes
- Automatically add multiple resource unit graphics to diagram layout
- No longer dependent upon ProModel Professional license (now licensed separately)
- Enhanced logic windows to provide syntax checking and guided logic statement creation

- Model upgrade - models from previous versions are now automatically upgraded to latest version when loaded
- Routing and arrival connections show an error when not properly connected to shapes
- Object reference list window – appears when deleting simulation objects that are referenced elsewhere in the model and provides a means for removing the references before the object can be deleted.
- Unique object names enforced.
- Order fulfillment/replenishment – new functionality to model order fulfillment and replenishment is added which includes a new Ordered arrival and routing type connections and a new connection type called an Order Signal.
- Throughput count displayed on all route to exit connections added at simulation run time
- Improved the Simulation Object Explorer usability and added a toolbar
- Added context sensitive help throughout the application
- Added validation of property values throughout the application
- Complete connection validation and visual error feedback
- Added Alternate and Outlet routing type connections
- 3DR default statistical view of key metrics such as throughput, activity state, resource utilization, etc. (previously was only a blank slate when statistics were viewed relying on the user to choose what to see post-simulation)

#### **2.1.0.27 (February 2003)**

##### *Features*

- Updated and improved the variables and attributes window including sorting by column headers
- Simulation Object Explorer added to provide a hierarchical overview of all simulation objects contained in a diagram

#### **2.0 Release (July 2002)**

##### *Features*

- Renamed to ProModel PI (which stands for Process Improvement)
- Custom built property windows
- Improved stencil containing new shapes
- Entity batching and unbatching
- Ability to define logic for precise process modeling
- Added Resource objects
- Added Continuous and Scheduled type arrival
- Added Conditional, Attach, Detach, and Create type routings
- Shift definition for resources and activities
- Multiple units and percent availability definition for resources
- Scenario Management
- Variables and Attributes

#### **1.1 Update (April 2002)**

This update contains bug fixes, improved installation, and better compatibility with Visio.

##### *Features*

- Animation window now contained within the Visio application (it previously ran in a separate window)
- Included the new 3DR output viewer

### **1.0 Release (March 2001)**

Originally called the ProModel Plug-in for Microsoft Visio. The purpose of this version was to introduce a free plug-in that would allow the simulation of existing Visio diagrams with little effort.

#### *Features*

- Auto-add simulation properties to the shapes contained in an existing Visio diagram
- Create a simulation diagram from an existing simulation template and stencil
- Activity and Entity objects
- Can change basic properties such as activity capacity, duration, and cost
- Percentage-type routing only
- Periodic-type arrivals only
- Change the simulation run length and number of replications
- Simulate and view statistics