

		OutSystems	Mendix	RakRak Framework3	GeneXus
Developer		OutSystems (Portugal)	Siemens (Germany) (acquired Mendix (Netherlands))	Sumitomo Electric Information Systems (Japan)	GeneXus S.A. (Uruguay)
Release of first version		2001	2005	2000	1989
Users		<ul style="list-style-type: none"> Over 1000 companies overseas Over 100 companies in Japan 	<ul style="list-style-type: none"> Over 800 companies overseas Over 10 companies in Japan 	<ul style="list-style-type: none"> Over 660 companies in Japan 	<ul style="list-style-type: none"> Over 8700 companies overseas Over 700 companies in Japan
Overview		A model-driven development platform using visual modeling languages. Contains extensive range of features for efficient model-driven development, such as input support, thorough visualization of logic and real-time detection of bugs in models.	A model-driven development platform using visual modeling languages. Includes platforms to acquire templates and components to generate the latest UI and a collaboration feature to assist in agile development.	A development platform that achieves fast development by automatically generating web applications through automatic analysis of data models. Highly compatible with DOA (data-oriented approach).	A development platform that achieves fast development by deducing methods to fulfill business specifications in various implementation environments and then automatically generating an application.
Features of tool	Automatic generation of models	Uses table information defined as data models to automatically generate screens (list screens, detail screens) with maintenance features corresponding to each table.	Rather than an automatic generation approach, this tool uses highly functional widgets to reduce the volume of code that is written. The widgets simply map tables to generate the table layout of list screens and the format of detail screens.	Uses table information defined as data models to automatically generate screens (list screens, detail screens, CSV uploads and downloads) with maintenance features corresponding to each table. Around 10 styles that differ slightly in appearance are generated, and the user can select the format that suits their needs.	Automatically generates screens for physical data models (table structures, relations) from conceptual data models or business rules.
	Autocomplete	In addition to an autocomplete feature where options for parameters and other elements are displayed in the window where formulae and scripts are written, the tool has a feature to select objects such as widgets, databases and variables that can be referenced from the code in an object list.	Provides an autocomplete feature where options for parameters and other elements are displayed in the window where formulae and scripts are written.	As this tool is a web-based editor, it does not provide an autocomplete function directly in the window where JavaScript is written, but there is a feature for searching and selecting options in areas where elements such as function parameters are specified. The autocomplete feature can be used when writing SQL.	Provides an autocomplete feature where options for parameters and other elements are displayed in the window where formulae and scripts are written.
	Testing	All of the tools provide a feature to immediately execute applications that have been generated.			
Model-based debugging - can the development tool perform debugging on a model basis (break point, step execution, variable reference)		Yes	Yes	Partially (a detailed execution log is displayed on the screen when the application is executed in debug mode)	Yes
Screens	Development method	<ul style="list-style-type: none"> Screens are designed in the GUI editor. UI components are defined together in a template, and fine adjustments (moving objects, setting properties, etc.) can then be made. Fields can be automatically generated from data models. 			
	Freedom of design	Fine adjustments to the HTML cannot be made, but adjustments can be made by adding a unique style sheet or JavaScript.		Fine adjustments to the HTML can be made. Adjustments can also be made by adding a unique style sheet or JavaScript.	
	GUI components	Basic input components such as text, radio buttons, combo boxes and file uploads are supported (details provided in the GUI Components Table).			
	Validation	<ul style="list-style-type: none"> Basic validations: Validations are automatically generated for stand-alone items according to conditions set in the data models. Unique validations: Unique validations that are used for complex items or dependent on business rules can be performed by manually adding more detailed rules. 			
	Paging of grid components	<ul style="list-style-type: none"> All of the tools have a feature to load multiple records and display them in a list. The number of records to be displayed on each page can be specified, and records can be displayed on multiple pages if there are many records. Other features such as moving to the next or previous page or jumping to a specific page are included in the general paging UI. It is also possible to load only some records from the database to prevent a decrease in performance when there is a large volume of data. 			
	Dialog boxes	All of the tools support modal dialog boxes for notifications.			
Compatibility with mobile devices	Compatibility	Responsive web design is used for screens that are generated, enabling them to be viewed on tablets or smartphones with no modifications. It is also possible to generate a different screen for mobile devices if necessary.			
	Compatible devices	iOS, Android, Windows Phone	iOS, Android, Windows Phone	iOS, Android, BlackBerry	iOS, Android
	Offline (application) support	iOS, Android	iOS, Android	A feature to assist in development of hybrid apps (apps for both Android and iOS) is scheduled for release during the 2019 financial year.	iOS, Android
Business logic	Development method	<ul style="list-style-type: none"> Expressed as visual models in flow chart format. Components for complicated processes are created using C# (OutSystems) and Java (Mendix). 		<ul style="list-style-type: none"> Expressed in linear processing order. Components for complicated processes are created using Java. 	<ul style="list-style-type: none"> Written in script language specific to GeneXus.
	Transactions	All of the tools provide features for automatic committing and automatic rollback in the event of an error, along with committing and rollback in desired locations.			
	Language(s) that can be used for extension of features	C#	Java	Java	Java, C#
Data models	Development method	<ul style="list-style-type: none"> Data models are designed independently of database products in the data model editor. 		<ul style="list-style-type: none"> Data models designed using other database design tools are imported in text format. Data models can also be designed in the data model editor. 	<ul style="list-style-type: none"> Data structures are defined by objects called transactions. GeneXus then automatically designs data models by deducing from this information.
	Data format	<ul style="list-style-type: none"> Basic elements such as character strings, numbers, flags and dates are available. Binary format is also available to store files in tables. 			
Batch development	Development of processes that are not linked to screens	Available	Available	Available	Available
	Scheduler	Available	Available	Available	Not available
Linking with other systems	Web services (SOAP, REST, etc.)	All of the tools have a feature for external HTTP-based linking, enabling linking with web services provided by SOAP and REST.			
	SAP	Available	Available	Available	Available
	External databases	All of the tools provide a method for accessing other databases.			
Other features	Version management feature (internal repository for version management)	Available (branch feature will be implemented later)	Available (branches can also be created)	An alternative is available (has a feature for linking with a version management system)	Available (branches can also be created)
	Collaboration feature (feature to assist with communication between project owners and developers)	Available	Available	Available	Not available
Execution environment	On-premises	Available	Partially available (deployment feature is for MendixCloud only)	Available	Available
	Cloud	Available (PaaS available)	Available (PaaS available)	Available	Available
System requirements (on-premises)	OS	Windows	Windows, Linux		
	Application servers	IIS	An application server is not needed as one is included in the platform.	WebSphere, Oracle Application Server, WebLogic, Cosminexus, WebOTX, Interstage, Tomcat, etc.	JavaEE server, Servlet server or .Net server
	Databases	Oracle, SQL Server	SQL Server, MySQL, Oracle, PostgreSQL	Oracle, DB2 UDB, PostgreSQL, MySQL, SQL Server, SAP HANA, Informix, DB2/400, etc.	DB2, Informix, MySQL, Oracle, PostgreSQL, SQL Server, SAP HANA
Scalability		All of the tools enable HA, clustering and introduction of high-performance hardware in infrastructure layers to increase performance and reliability.			
Licensing	Billing for development environment (factors influencing billing)	None	None	<ul style="list-style-type: none"> Number of developers (user licenses) Number of servers (server licenses) 	<ul style="list-style-type: none"> Number of developers
	Billing for execution environment (factors influencing billing)	<ul style="list-style-type: none"> Number of objects (screens + tables + API) Number of environments Number of end users 	<ul style="list-style-type: none"> Number of environments Number of end users 	<ul style="list-style-type: none"> Number of servers 	None
Support in Japanese	Supported channels	Email, web form	Web form	Email, web form	Web form
	Support hours	24/365 (support available in English outside business hours)	24/365 (support available in English outside business hours)	24/365 (only available by registering inquiries outside business hours)	24/365 (only available by registering inquiries outside business hours)
Learning support		Support for product learning is available in two forms: a manual in Japanese and a paid training service.			

GUI component table

	OutSystems	Mendix	RakRak Framework3	GeneXus
Text	X	X	X	X
Passwords	X	X	X	X
Text areas	-	X	X	X
Buttons	X	X	X	X
Labels	X	X	X	X
Checkboxes	X	X	X	X
Radio buttons	X	X	X	X
Combo boxes	X	X	X	X
List boxes	X	-	X	X
File uploads	X	X	X	X
Images	X	X	X	X
Date input calendars	X	X	X	X
Toggle buttons	X	-	X	X
Progress bars	X	X	X	X
Badges	X	X	X	X

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Text	X	X
Passwords	X	X
Text areas	-	X
Buttons	X	X
Labels	X	X
Checkboxes	X	X
Radio buttons	X	X
Combo boxes	X	X
List boxes	X	-
File uploads	X	X
Images	X	X
Date input calendars	X	X
Toggle buttons	X	-
Progress bars	X	X
Badges	X	X

