Report

Group Report 1

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EXECUTIVE SUMMARY

This report provides an overview of BPMN standard and specifications, Top 10 widely used BPMN Modeling Software tools in 2022, and the usages of three software tools including Signavio, Biazagi, and Cardanit with the main features comparison. Method of analysis includes the exploration of BPMN modeling tools to find the significant features, pros and cons with the differences. Most information was gathered by indexing from the web searching and the real experiment from the member to make reliable information. The report shows that there are several options for the users to select the suitable modeling tool. Typically, it depends on the purposes and preferences of the end users, the researchers may use this report to get a brief information about each tool and the comparison table to see the differences clearer.

Since the BPMN Modeling Software tools are widely used in the business as it helps both high and low level employees in the organization to understand the workflows of each process, the contents can be indexed quickly. However, there are some parts that the researchers are required to explore themselves to make a precise conclusion including the experiences when using the BPMN tools.

Recommendation

The recommendations discussed includes:

1. The organization is suggested to provide a standard notation such as Business Process Modeling Notation (BPMN) that can be easily understood by all stakeholders.

2. There are several tools with different features, the most suitable tools depending on the usages and purposes of the business which can be found on "Top 10 widely used BPMN Modeling Software tools in 2022" and "The comparison of top three BPMN tools: Signavio, Bizagi, and Cardanit"

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BPMN standard and specification

What is BPMN?

Business Process Model and Notation or BPMN is used commonly by business owners and technical users to plan and apply business processes. Nowadays BPMN has developed to version 2.0 and is supported by various tools with over 70 entries. BPMN 2.0 is an open standard notation system similar to a flowcharting technique that is used to model business processes. The standard is broadly used in business process management due to it is easily comprehensible by business users while also giving technical users able to visualize and implement complicated processes [35].

BPMN Uses & Benefits

BPMN 2.0 is used to build and comfortable to follow business process model flowcharts. Similar to other business process modeling tools, BPMN helps stakeholders gain a better understanding of a process through an internationally understood language and notation. The diagram representation of the steps associated with a business process makes it easy for business users to understand how a process works. BPMN also makes it easy to close the gap between the numerous stages of business process management, able to move from business process design to implementation easily, and providing stakeholders that serve different functions the ability for collaboration work [35].

BPMN Symbol Types

As a standard notation, BPMN has many symbols to use to represent and visualize the process of the business. The symbols fall into four main groups [35]:

- **Flow objects**: Overall, there are 3 main flow objects called events, activities, and gateways. Events emerge that start, change, or complete a process. Activities are jobs performed by persons or technology. Gateways are decisions that cause many consequences.
- **Swimlanes**: A pool includes the person who is associated with a process. Swimlanes show the activities for each contributor.
- **Connecting objects**: show relationships and how the elements of a process relate to other entities. There are 3 types of connecting objects: sequence flow, message flow, and association. Sequence flow tells the order that activities will be done.

Message flows tell collaboration between offices. Association shows the relationship between an artifact to an event, activity, or gateway.

- **Artifacts**: Artifacts are used to show additional information about a process. There are 3 types of artifacts: data objects, groups, and annotations. Data objects display what data is needed for an activity. Groups show the logical grouping of activities. Annotations are used in case of explaining numerous aspects of the diagram.

Basic BPMN Modeling Elements

It cannot be denied that one of the drivers for the development of BPMN is to create a simple and understandable step for creating business process models. This gives a small set of notation types so that the reader of a BPMN diagram can remember the basic types of symbols and understand the diagram easily. The following list shows a set of the basic modeling notations used to create a BPMN diagram [41][42]:

Element	Description	Notation
Start Event	It represents the starting of the business process.	
Intermediate Event	It represents any event that arrives in between the start and the end events.	
End Event	It represents the final step of a business process model.	

Message Start	This describes that a task would be started after getting a message.	
Timer Start	This specifies that a task starts after a set time.	
Conditional Start	A task is started when a particular condition is met.	
Signal Start	A process is started after getting a particular signal.	
Multiple Start	Explains that there are various ways to start a process.	
Error Start	This shows that an error occurred at the starting process.	
Message Intermediate	This describes that the event can send or receive a message.	

Timer Intermediate	It describes a waiting time during processes and it would be resumed once the timer is due.	
Conditional Intermediate	The next event would be considered after meeting a particular condition.	
Signal Intermediate	The arriving or outgoing process depends on a particular signal.	
Multiple Intermediate	It explains that there can be multiple triggers for the process.	
Canel Intermediate	This depicts that an alternative flow can be made when a transitional progress is canceled.	
Error Intermediate	Illustrate an error at any intermediate task.	
Compensation Intermediate	It is used to manipulate any immediate process.	

Link Intermediate	This symbol is used to connect two different parts of an intermediate process.	
Message End	This means that a message is delivered when the process comes to a termination.	
Signal End	When a task is completed, a signal is created by the system.	
Multiple End	There can be various instances at the end of the process.	
Cancel End	It is used when a transitional sub-process requires it to be canceled.	
Error End	When the task ends, an error emerges.	
Compensation End	It describes that when the process terminates, compensation must cope with it.	

Task	This describes any job that an event can operate on. Simplest activity that cannot be failed further.	
Collapse Sub-process	This notation presents a group of jobs (known as sub-process) that are merged in one place.	
Transaction	This is the specific identity of a sub-process that would involve a payment or transaction.	
Call Activity	It is a global sub-process that you can take as a reference anywhere in the diagram.	
Exclusive	Once the task is evaluated, it would split the flow into two or more sections that are mutually exclusive to each other.	
Event-based	An event-based gateway is also related to a single path, but it evaluates if an event has emerged to meet the condition.	
Exclusive event-based	A new event is started when each (exclusive) condition of the flow is met for the determined event.	

Parallel	The parallel gateway can display two or more simultaneous tasks that are not dependent on each other.	
Parallel event-based	Multiple tasks are allowed to be performed, but they are dependent on the occurrence of a particular event.	
Inclusive	This gateway splits the overall of the process into numerous flows that can have dedicated triggering events.	
Complex	It is used to represent a complex flow in a business process. For instance, when a business gateway has many flows with distinct factors.	
Sequence Flow Symbol	Used to describe the flow in a process that is consecutive order.	
Message Flow Symbol	This is simply present how a message is distributed across a process.	
Associate Symbol	It depicts any sort of relationship between artifacts and other objects.	

Top 10 used BPMN Modeling software tools 2022

1. Kissflow
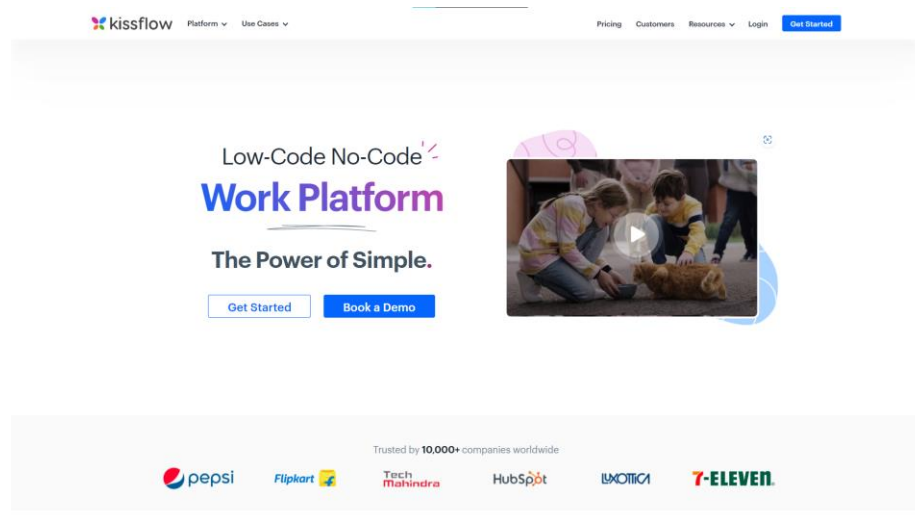
Figure 1: Kissflow website interface [19]

Kissflow Process Creator is the most used BPMN software in 2022. Since it's no-code software, the user can create the process by using its user interface. Moreover, Kissflow Process Creator supports Inter-process communication, which reduces complexity of API Integrations.

2. Process Maker
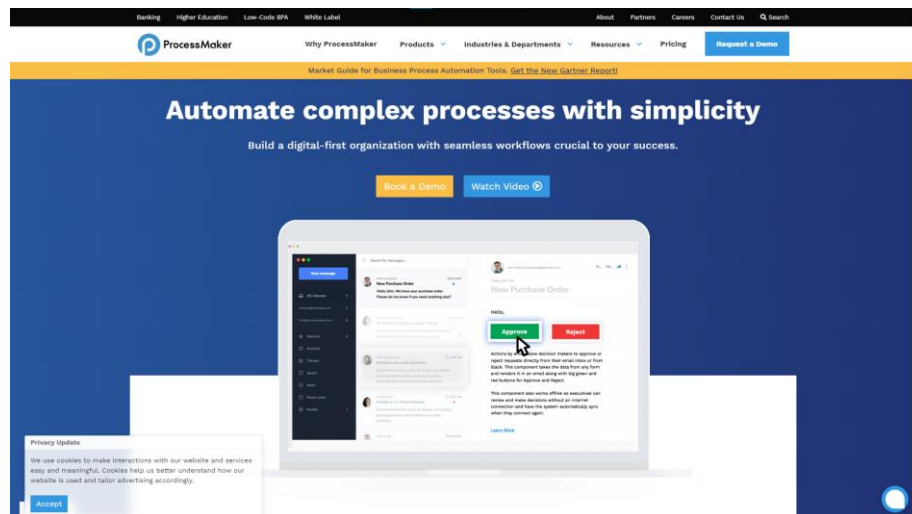
Figure 2: Process Maker website interface [20]

Process Maker low-code BPMN 2.0 helps customers to design, digitize, and automate business processes. Moreover, the customers can use the application to create a dashboard from existing data and queries, which allow them to manage and organize their business efficiently.

3. Zoho Creator
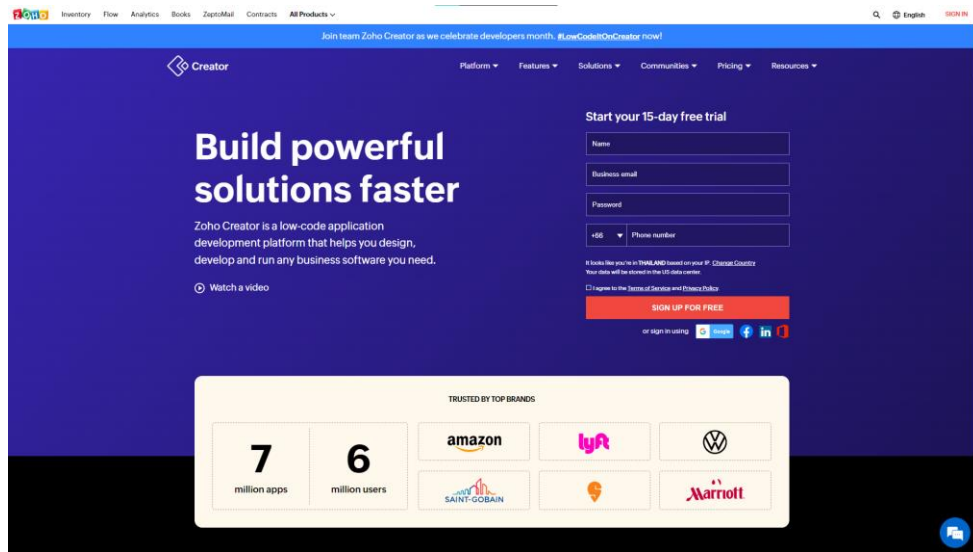
Figure 3: Zoho Creator website interface [21]

Zoho Creator leverages a blueprint visual representation of a business process, which simplifies the process modeling. In addition, Zoho creator can connect with over 600 tools to sync data and action on its platform.

4. Nintex
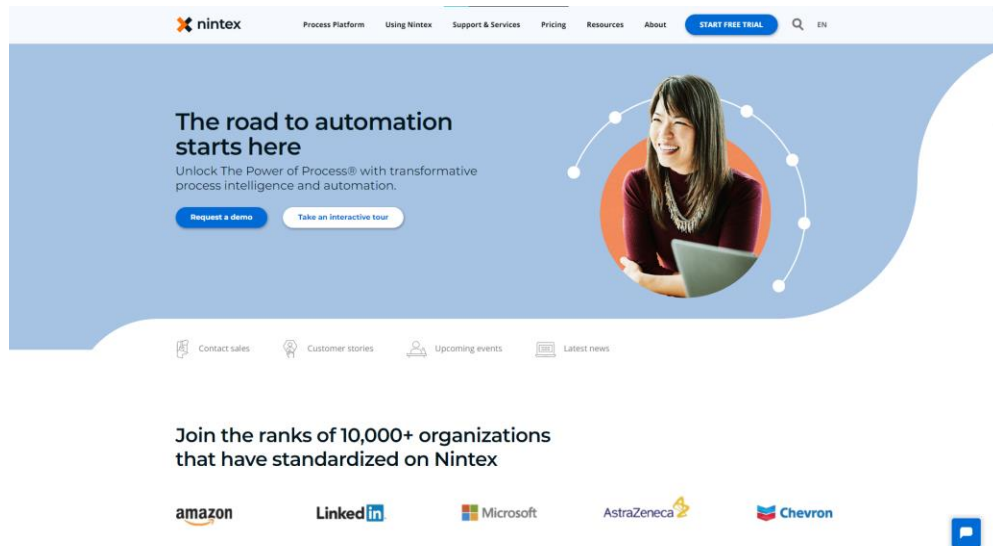
Figure 4: Nintex website interface [22]

Nintex, developed by Australian entrepreneurs, Brain Cook and Brett Campbell, is a workflow automation offering a drag and drop workflow that allows organizations to quickly create and publish the business processes.

5. Bizagi
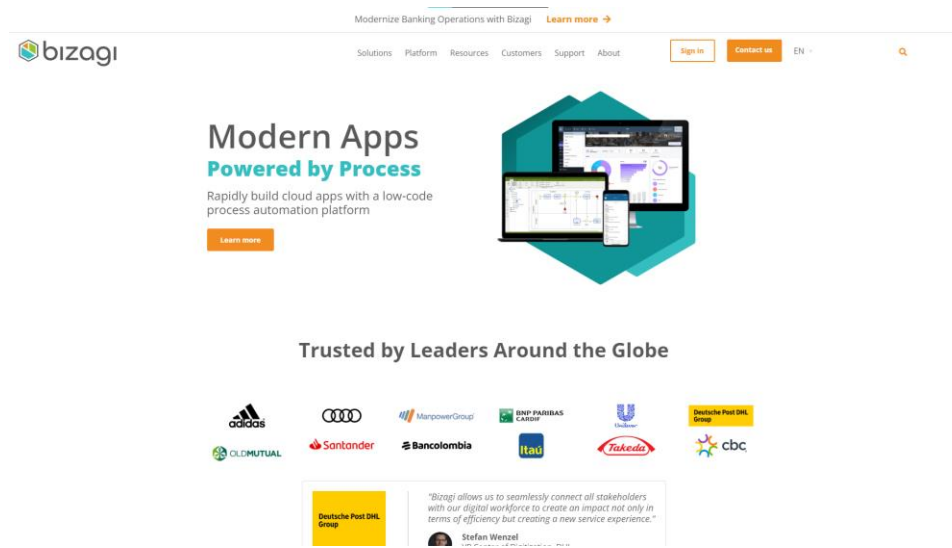
Figure 5: Bizagi website interface [23]

Bizagi is an Intelligent Business Process Automation platform consisting of 3 applications to create enterprise applications including Bizagi Modeler, Bizagi Studio, and Bizagi Automation.

6. Bonitasoft
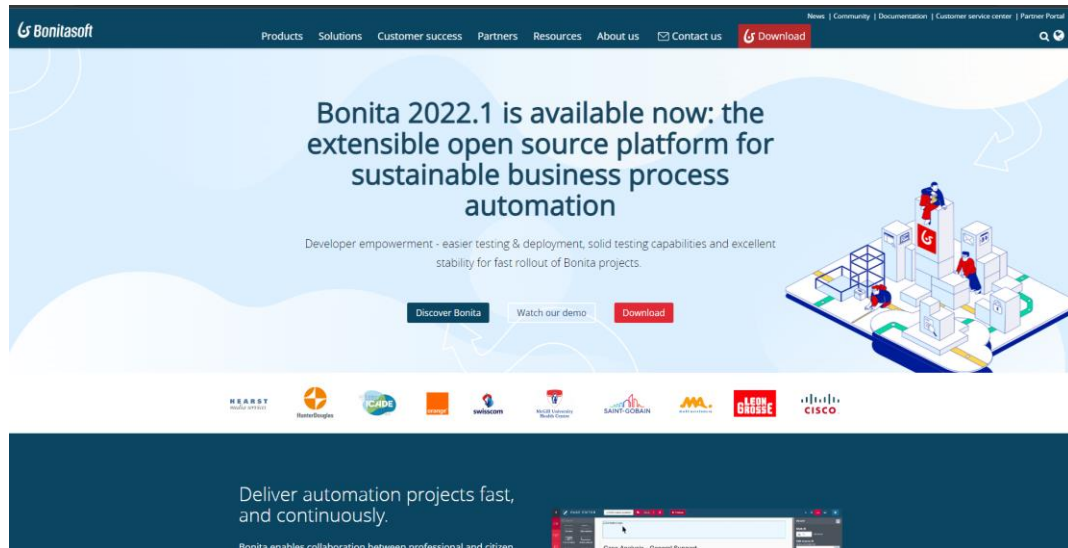
Figure 6: Bonitasoft website interface [24]

Bonita Studio is an open source Business process management platform, which supports BPMN 2.0, created in 2001. It supports application developments and allows end-users easily with Bonita Runtime.

7. Appian
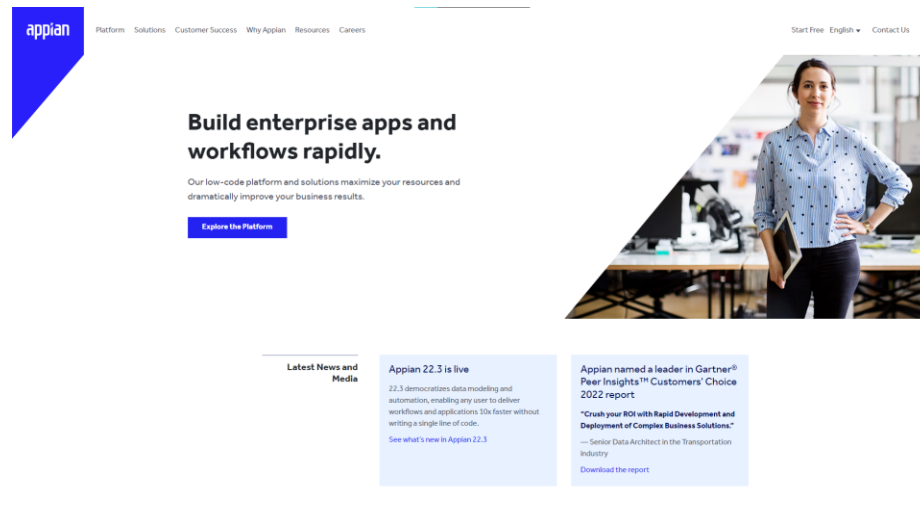
Figure 7: Appian website interface [25]

Appian BPM suite utilize AI to suggest the user during workflow creation, promote the business activities automation such as sending email or writing query to the database without coding, and embed workflows into applications.

8. SAP Signavio
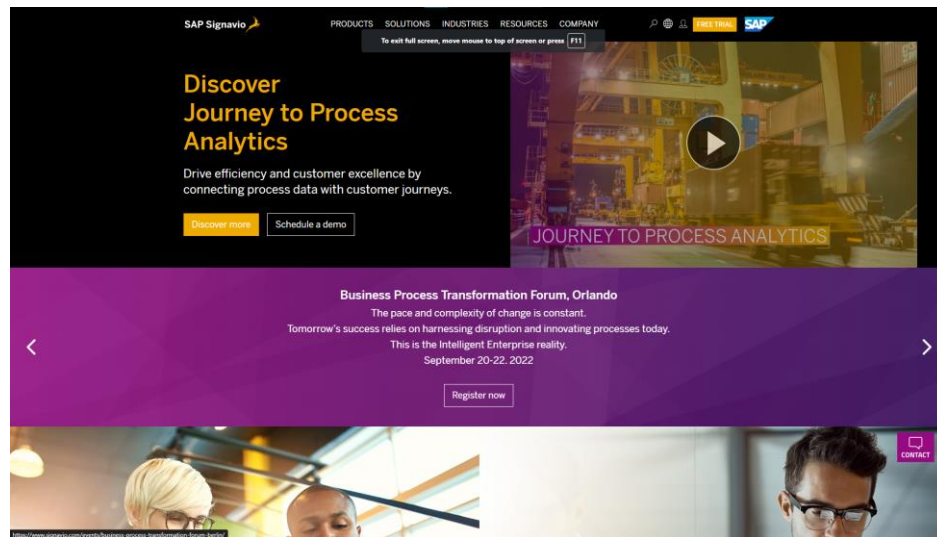
Figure 8: SAP Signavio website interface [26]

Signavio is the first completely web-based collaborative BPM software founded in 2009 in Germany. In 2021, SAP completely acquired Signavio. The stand out feature of Signavio is the simulation feature that will simulate the impact of potential changes and improvements.

9. Creatio Process Designer

Figure 9: Creatio Process Design website interface [27]

Creatio Process Designer leverages BPMN 2.0 standard, which allows both IT and businesses to easily work on process models. In addition, it allows the customers to work on the process model together in real time.

10. IBM Blueworks Live
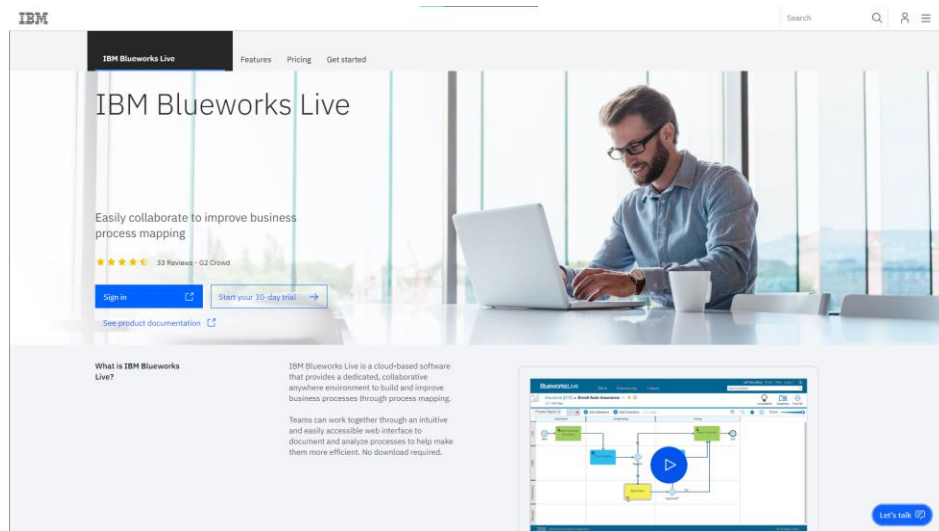
Figure 10: IBM Blueworks Live website interface [28]

IBM Blueworks Live is a user-friendly cloud-based BPMN software that allows the user to access and work together on the business process model anywhere anytime.

Tool 1 : Signavio

General Information

Figure 11: Signavio's logo [1]

Signavio is the first world web modeler for BPMN was founded in 2009 by Gero Decker, Torben Schreiter, Nicolas Peters, Willi Tscheschner, Mathias Weske. Signavio is a Business Process Management (BPM) software which is based in Berlin, Germany and Silicon Valley, Northern California. Signavio is a web-based business process modeling tool.

How to use Signavio

1. Go to https://editor.signavio.com/p/hub/home
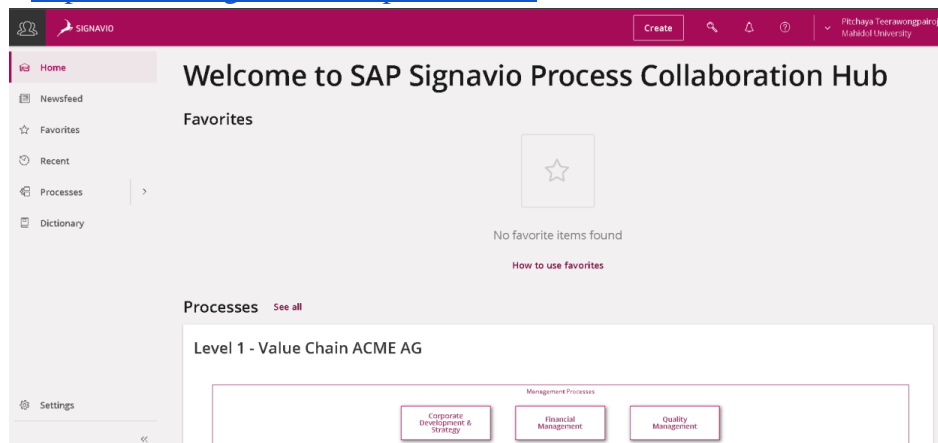
Figure 12: Signavi's homepage [1]

2. Login or Register to use Signavio

Figure 13: Signavio register's page [12]

13
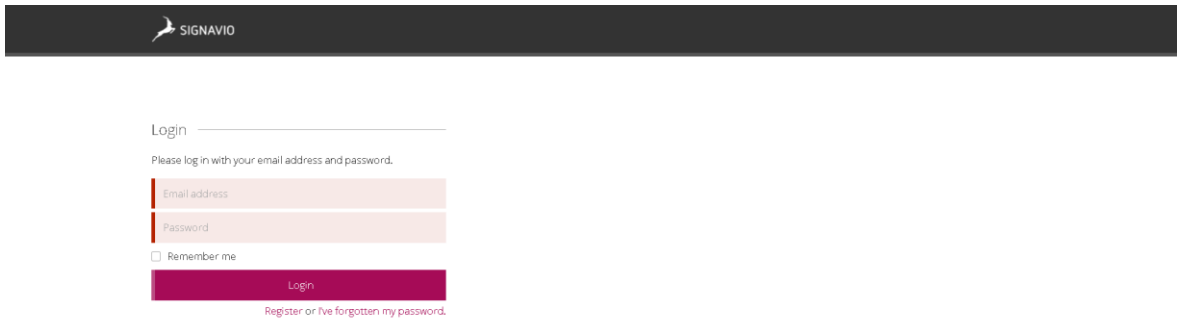
Figure 14: Signavio login's page [12]

3. After you login, you can use Signavio.
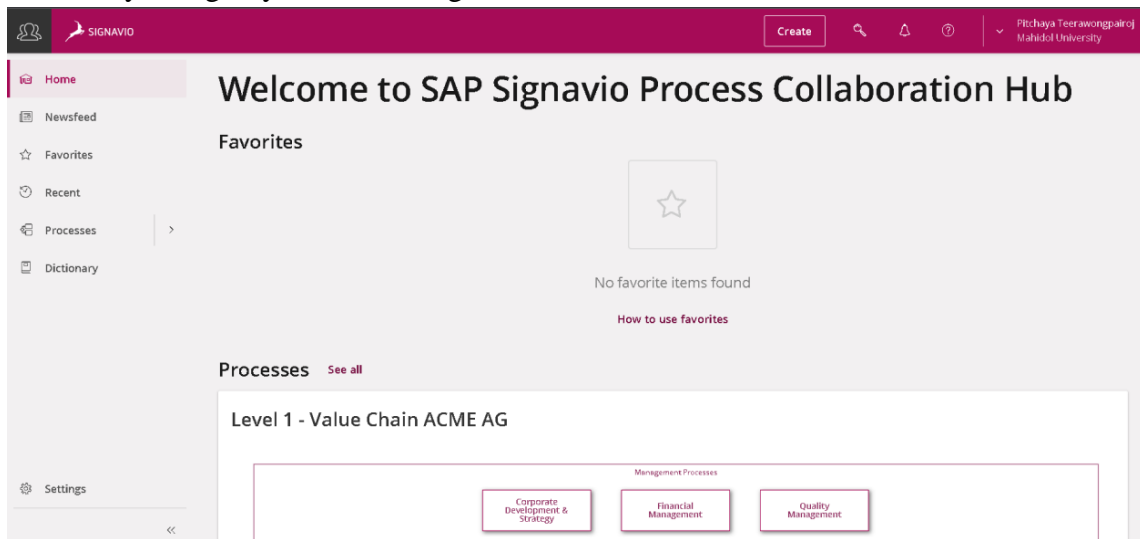
Figure 15: Signavi's homepage [1]
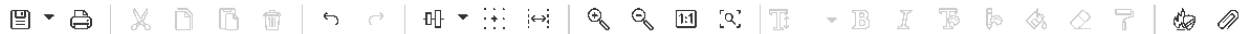
Figure 16: Supporter tools that help user work easier

Figure 17: Save tool

Save tool is for keeping and storing our BPMN model. Save function can make a copy to have two files of the BPMN model.

Figure 18: Print tool

Print tool is for users who have already done the BPMN model and need to print it into a paper. Print function will ask you the details of the type of paper you want to print.

Figure 19: Cut tool

Cut tool is to cut the selection that the user selects to the clipboard. The selection will disappear and the user can put it anywhere in the workspace. Move from this workspace into another workspace.

Figure 20: Copy tool

Copy tool is for users who want to make a copy of a BPMN element and put it anywhere in the workspace. This function will make user work easier and save time.

Figure 21: Delete tool

Delete tool will delete all selections that the user has already selected. If the user want to delete the whole workspace, user can

Figure 22: Undo and Redo tool

The Undo tool will undo your current action back to your previous action. Users can click the undo function until it reaches the limit. Redo function will redo your undo action.

Figure 23: Alignment tool

Alignment tool has nine subset functions including alignment left, center, right, top, middle, bottom, and distributes elements horizontally, vertically, and the same size.

Figure 24: Create and Hide Grid tool

Create and hide grid tool is for making a grid to your workspace which makes it easier for users to move elements into the same line. If the user clicks this function one time, it will show the grid. If the user clicks two times, it will hide the grid.

Figure 25: Create and Remove tool

Create and remove tool is for creating or removing free space by dragging and dropping. This function is really useful for moving vertically and horizontally at one time.

Figure 26: Zoom in and Zoom out tool

Zoom in and zoom out tool is for users who need a bigger BPMN model which is easier to look at. Sometimes users can see the text or object, they can zoom in. If the object is too big, the user can zoom out.

Figure 27: Standard Level tool

Standard level tool is for users who want to look at the overall BPMN model but users don't know how much they zoom in or zoom out. They can click this function, and it adjusts the workspace to 1:1 ratio.

Figure 28: Model Size tool

Model size tool is for users who don't know their work scale. Users can click this function, and it will automatically show all your objects in this workspace.

Figure 29: Text Tools

Text tools are for users who want to edit text to make text bigger, smaller, change text color, text highlight, etc.

Figure 30: Risk tool

Risk tool will show risk and controls on the process element which the user can use for your BPMN process.

Figure 31: Attached Document tool

Attached document tool will show all shapes with the attached document. It helps the user know which shape is already attached to the document.

Figure 32: Recheck tool

The Recheck tool is the most important tool. It can recheck for the syntax, simulation capability, cost and resource analysis,and BPMN method and style conversion.
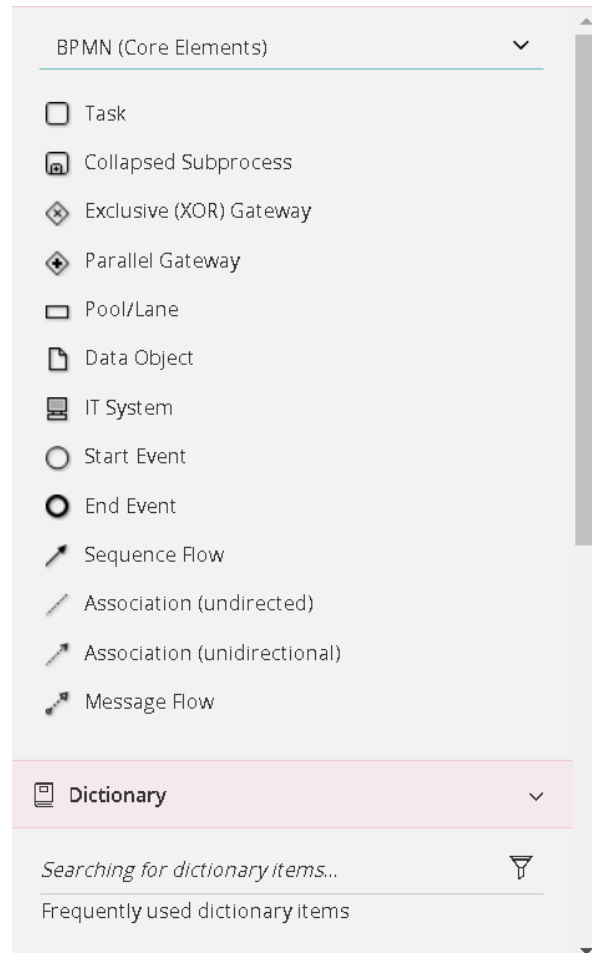
Figure 33: Tools to create BPMN model

For this tool the user has to understand what the BPMN model is. Users can learn from Signavio, YouTube, Books, etc.

Pros and Cons

Pros	Cons
1. **Drag and Drop function** - The drag and drop is easy to use and the interface look pleasant.[43]	1. **Missing necessarily** - Lag to concentrate on data mining, and missing necessarily needed enhancement in the core well. [43]
2. **Easy Learning** - Easy to learn BPMN model by non-technology employees because Signavio is a resource for people. [43]	2. **Slow System** - Missing workflow function including reporting,and dictionary. It quite slow for loading the report[43]
3. **Easy Collaboration** - Easy for collaboration which other people can come to do the process with teammate. [43]	
4. **Recheck Function** - It has a check function that can check for the final BPMN model.	

Company or organizations that use them

Figure 34: Airbnb's logo [44]

Customer: Airbnb

Industry: Lodging

Location: United State

Objectives: [44]

1. To create a world where anyone can belong to anywhere and focus on travel platforms that handle every part of the trip.

2. Make travelers feel like they belong to the communities they visit. Even if they are going for business trips, they want to make them feel impressive.

3. Increase travelers that use Airbnb for shorter trips which in the past Airbnb focused on long trips.

Achievements: [44]

1. Hosts sharing have earned over $80 billion dollars.

2. More than 220 countries.

3. Over 10.4 million guest arrivals.

Figure 35: BUGATTI's logo [45]

Customer:BUGATTI

Industry: Automotive

Location: France

Objectives: [45]

1. To be the first manufacturer ever to reach the magic 300-mile-per-hour mark.

2. Build the fastest cars in the world.

3. They will focus on other areas in the future.

Achievements: [45]

1. Test driver reached the top speed limit of exactly 490.484 km/h.

2. Increase the speed from 300km/h in 50 km/h increment.

3. The world record of Chiron.

Figure 36: BVLGARI's logo [46]

Customer:BVLGARI

Industry: Retail

Location: Italy

Objectives: [46]

1. Being a sustainable company which is creating a world. Everyone can thrive through social, environmental, and economic progress.

2. Improving society's quality of life through a proactive approach to ethical behavior, social, and economic development.

3. Always develop ethical, social, and environmental performance through the constant improvement of its activity.

Achievements: [46]

1. Over 1,100 members companies that can span jewelry supply.

2. Renewal of RJC OOP certification.

Example how to use tool to create business processes

1. Access https://editor.signavio.com/p/hub/home. Then, It will show this page after logging in.
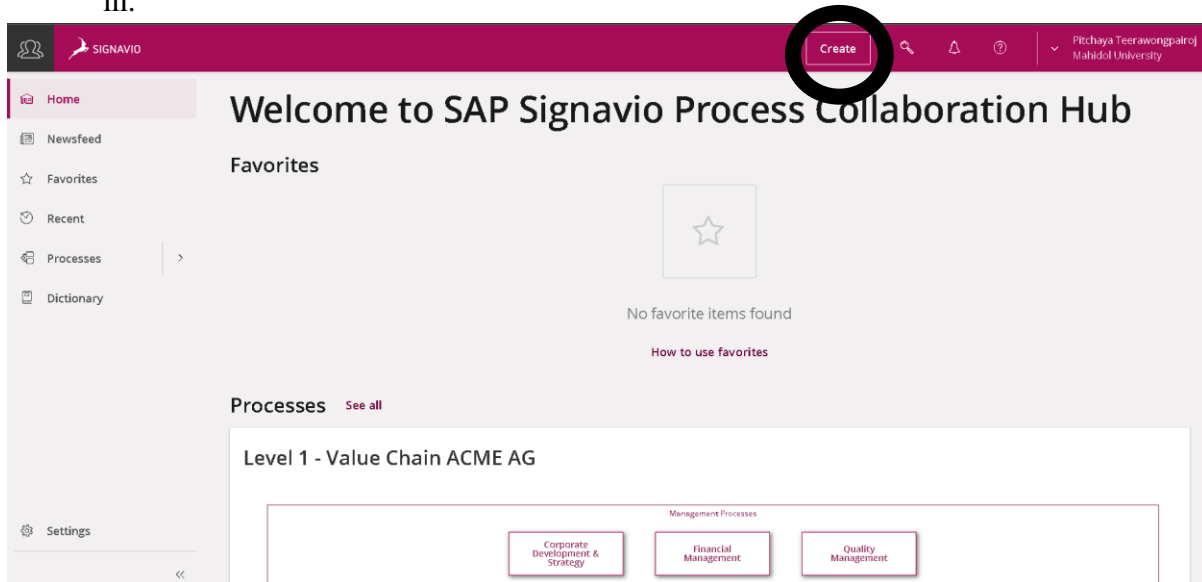
Figure 37: Signavio homepage [1]

2. Click at the create button

Figure 38: Signavio homepage [1]

3. Clicking the create button will show the modal to select the document type.
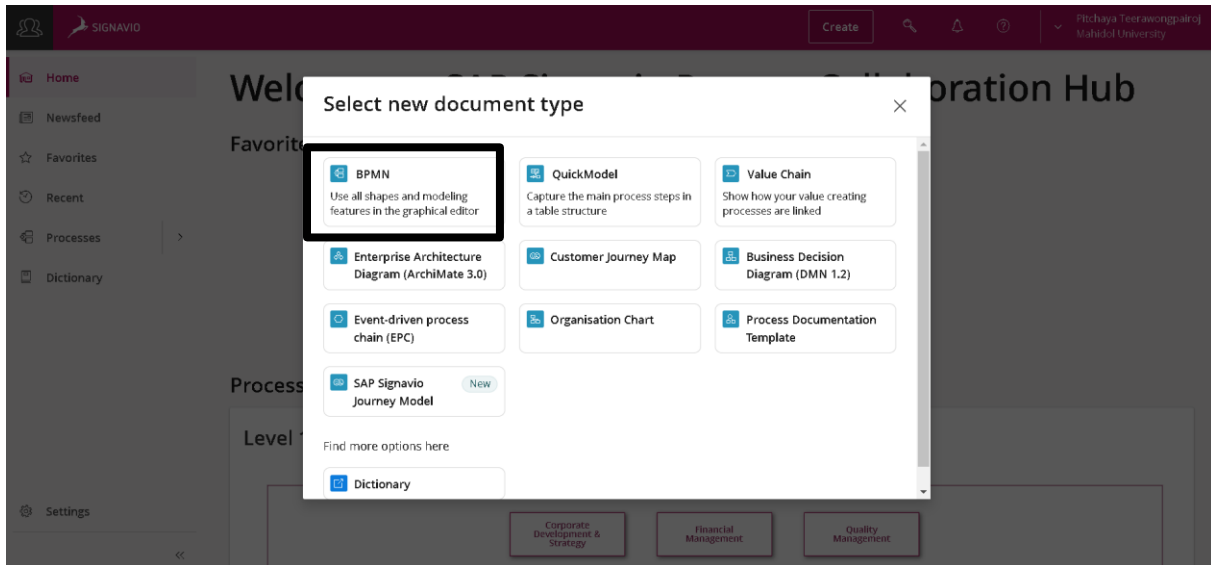
Figure 39: Signavio homepage [1]

4. Click on the BPMN button.
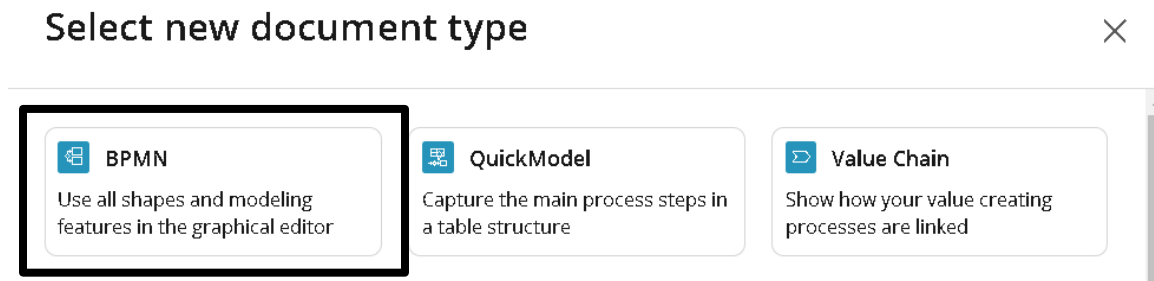
Figure 40: BPMN button

5. After the BPMN button is clicked, it will show like this.

Figure 41: Signavio for create BPMN model

6. There are tools of BPMN elements that can be dragged and dropped to workspace.

Figure 42: Tools for make BPMN model
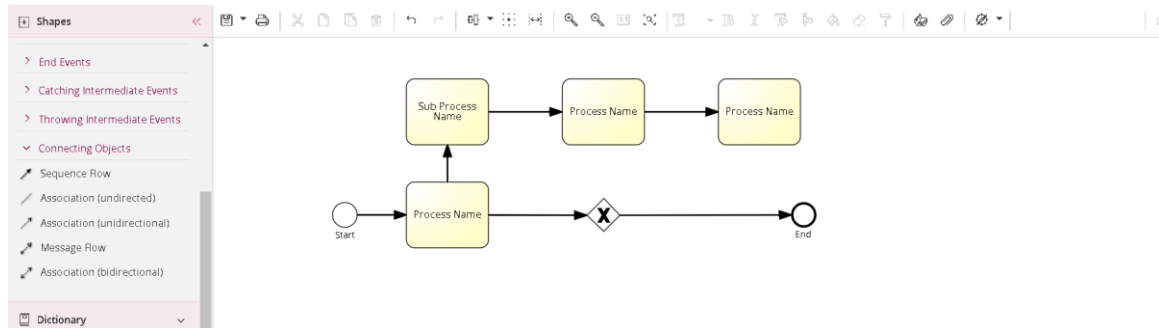
Figure 43: Example of BPMN model

Tool 2 : Bizagi

General Information

Figure 44: Bizagi's logo [4]

Bizagi is a privately owned software company in the United Kingdom founded in 1989. Its name is a combination between "business" and "agility". The organization provides enterprise software for Business Process Automation on a low-code development platform. It is written in Java and .NET Framework. [5]
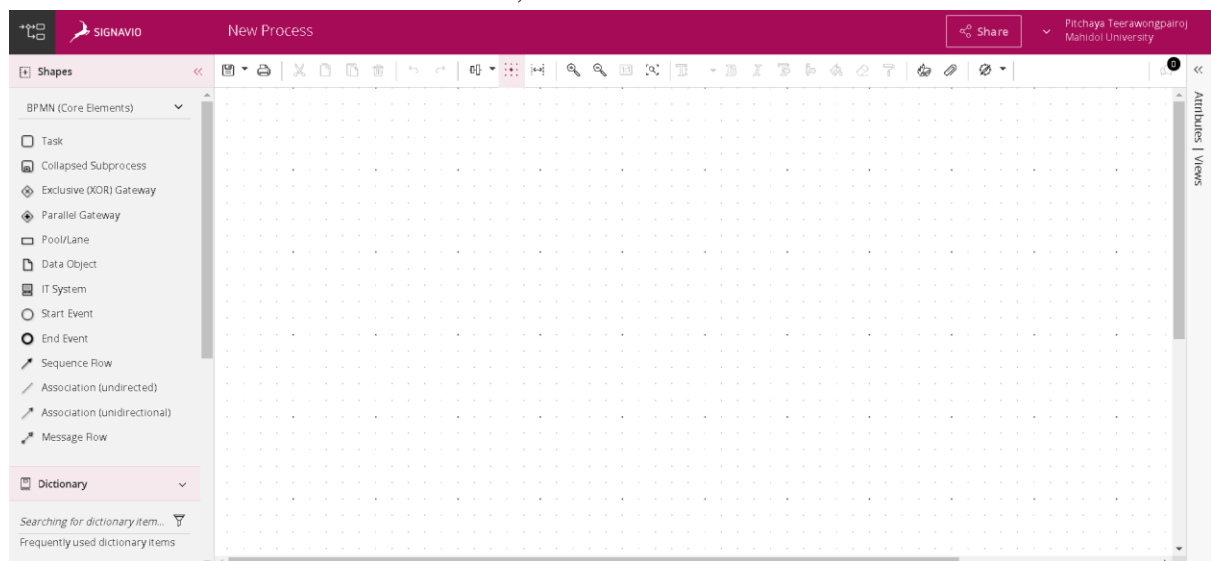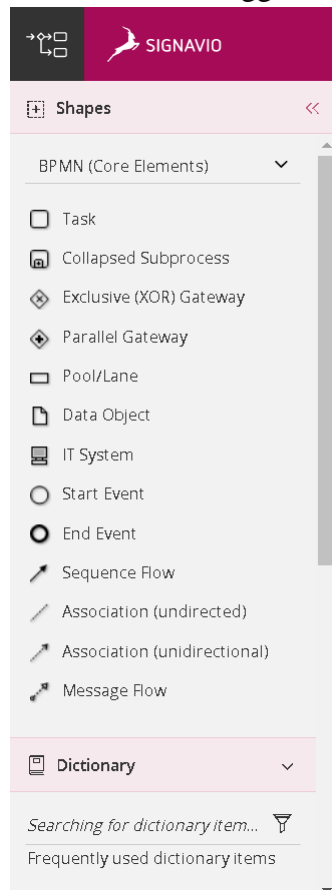

Figure 45: Bizagi's Process [4]

Bizagi is a platform that offers complex process automation. It enables the organization to visualize their process models into running applications and workflows. Starting from defining your data model and UI (Bizagi Modeler), and making the process automation (Bizagi Studio).

Products

It consisted of three main products:

1. **Bizagi Modeler** is a freeware application to simulate the business processes in a standard format known as "Business Process Model and Notation (BPMN)" in a central cloud repository, a diagram that helps people in the organization to understand the process and the responsibilities. Bizagi Modeler can be published to Word, PDF, Wiki, Web or SharePoint, and image formats. [5]

Figure 46: Bizagi Modeler [3]

2. **Bizagi Studio** is a freeware Business Process Management (BPM) that enables organizations to deliver end-to-end digital process automation. [5]

Figure 47: Bizagi Studio [4]

3. **Bizagi Automation** is a place where the end users can access through the device to see the previous modeled & automated processes of the organization. [5]

How to use Bizagi Modeler

Prerequisite: Bizagi Modeler must be installed before starting to build a model process.

1. **Process Modeling**

   1.1) Editing the pool name after opening the Bizagi Modeler desktop application, the first thing in a model is a diagram with an empty pool. Pool is the name of the process. The user can double-click it, press F2, or right-click and select ***Edit text*** from the menu. [6]
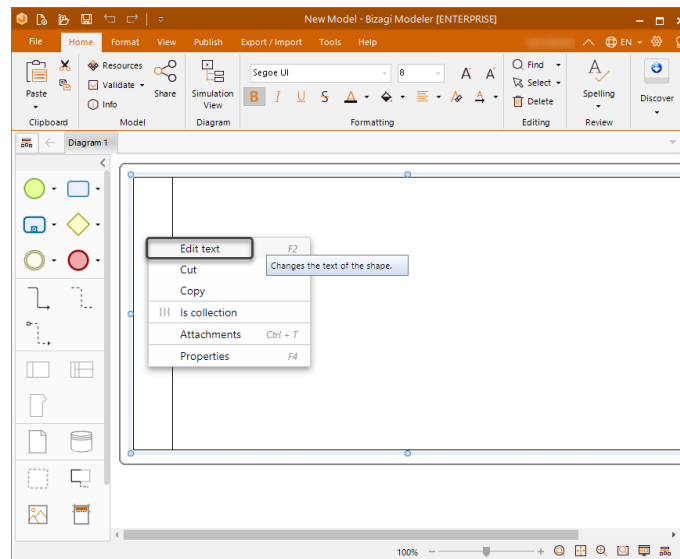
Figure 48: Edit text [6]

1.2) Identify the resources after editing the process name, the user should identify the main roles (or resources) related to the process. Each participant is represented by a lane. For instance, if there are 3 participants: the applicant, the boss, and the purchasing department, it would have 3 lanes in a pool. To add an element, the user can easily drag and drop each item from the Palette (left hand-side). [6]
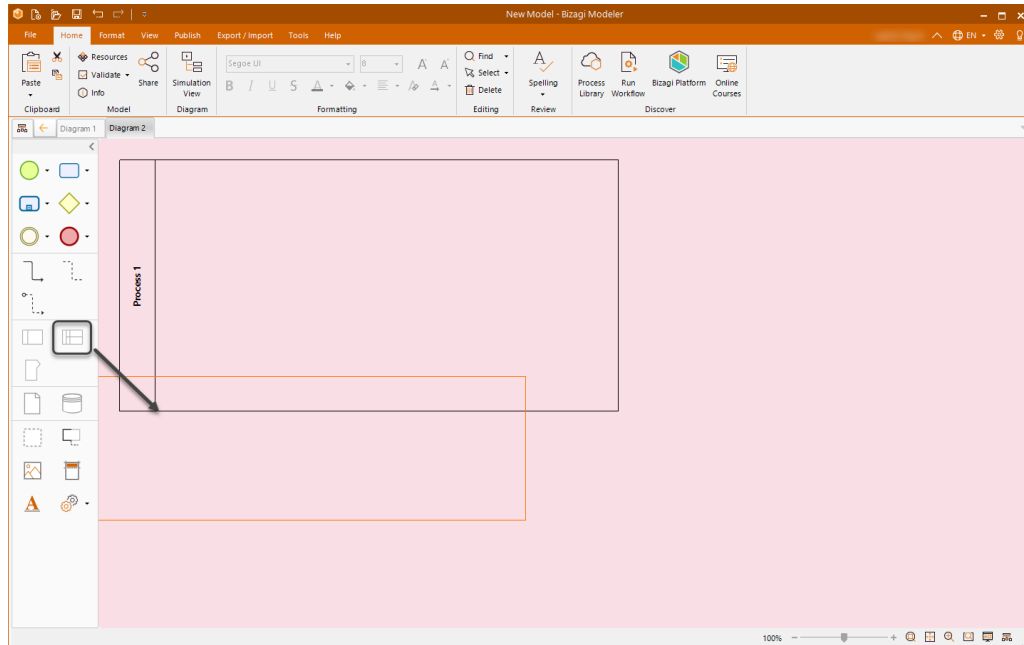
Figure 49: Drag and drop lane to a pool [6]
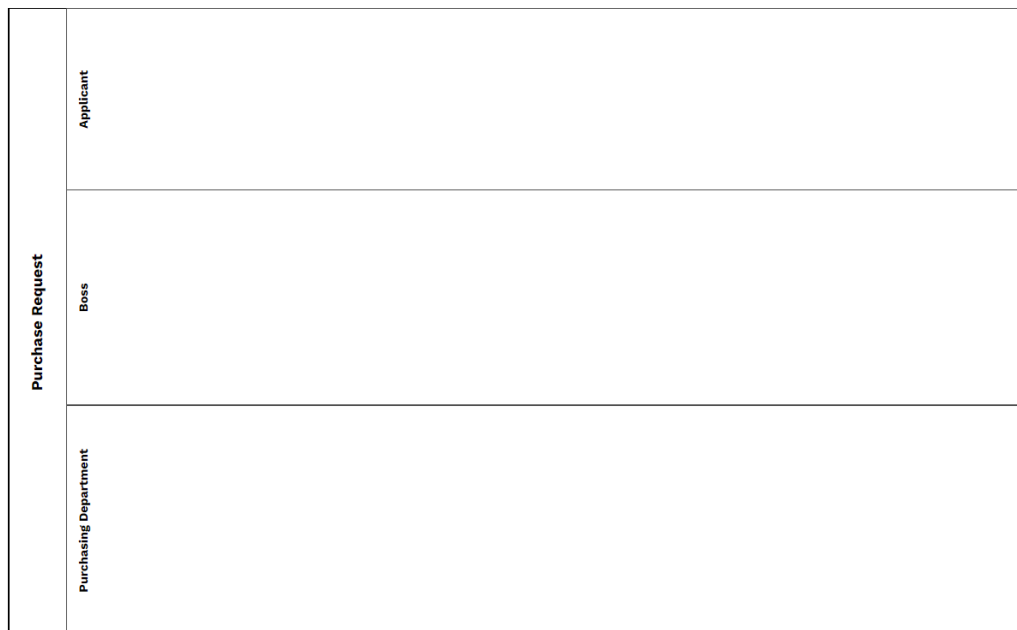
Figure 50: Result after adding lanes in a pool [6]

1.3) Add the shapes to the diagram all processes must have a "Start event" to trigger where the process begins. Then, the user can create the first task "Create Purchase Request". There are two options to create the task: *Drag and drop*, and Use the *Pie Menu* displayed from the start event. Once the process is completed, the user is required to add the "Milestone" to state the end of the process. [6]

Figure 51: Add a Start event symbol [6]

Figure 52.1: *Drag and drop* **the first task [6]**
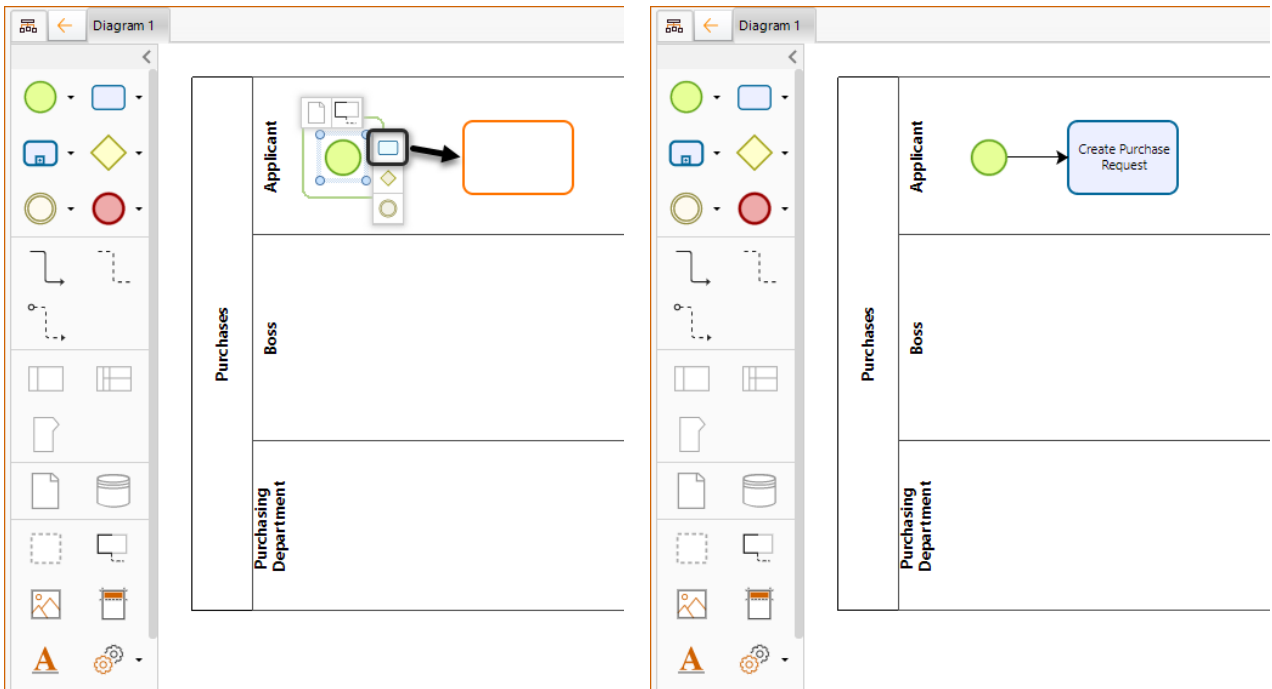
Figure 52.2: Use the *Pie Menu* from the start event [6]
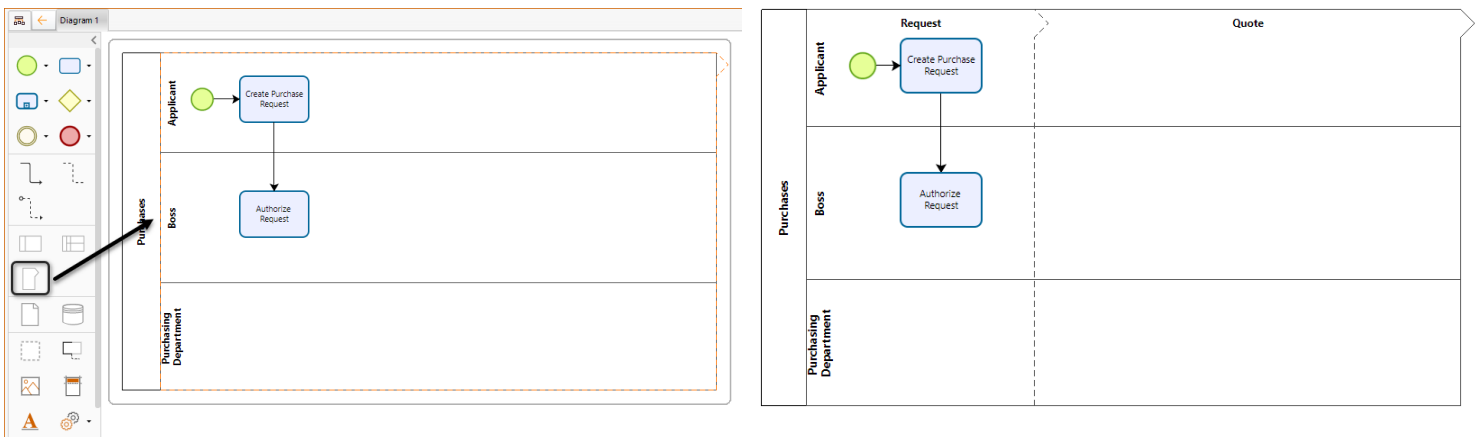
Figure 53 Add a Milestone to show the end of the process [6]

2. **Transform elements** when doing the real process, some adjustments are needed to build the desired result. This step is about changing the existing elements without losing any written contents. For instance, change the ***Notify Required Changes*** task, right-click it. [6]
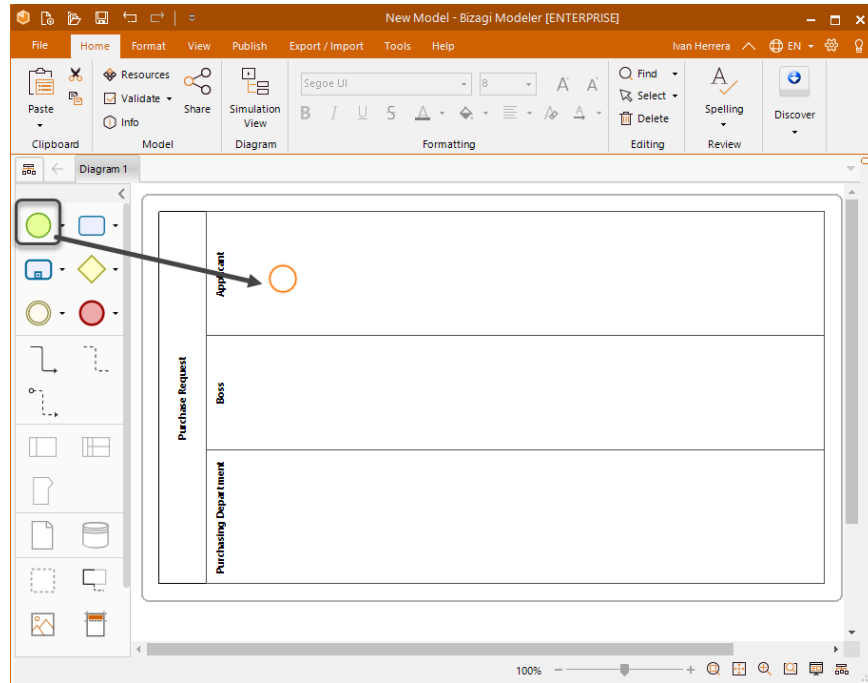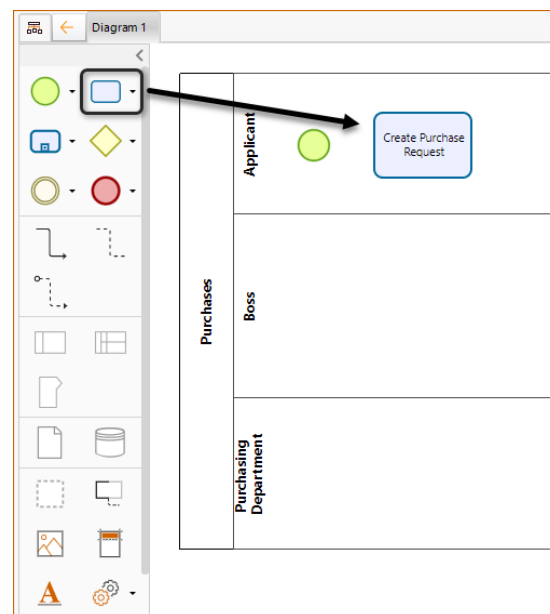
2.1) Change the task type to "Script task" . The user can easily change the task type by right-clicking and selecting "Task type", then clicking on the desired task type. [6]
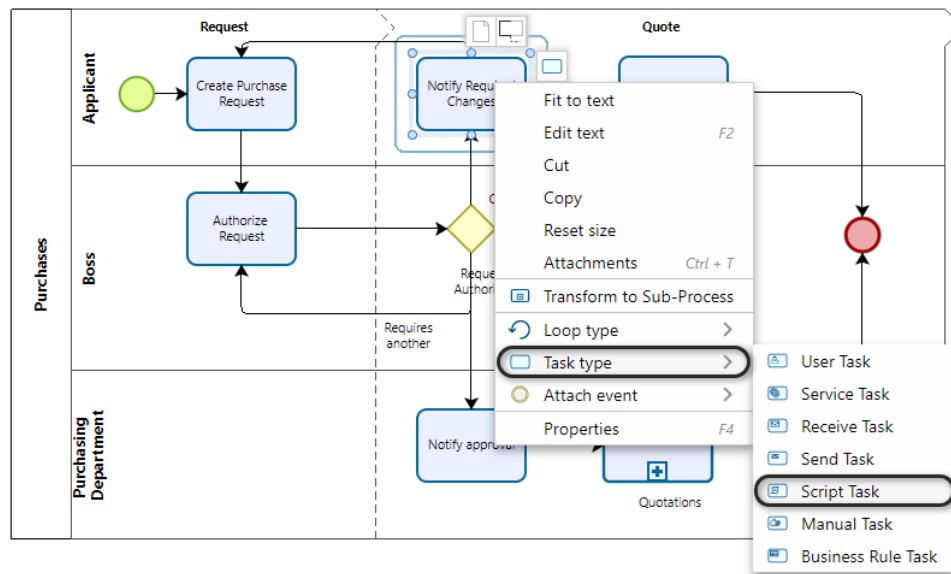
Figure 54 Change the task type to "Script task" [6]
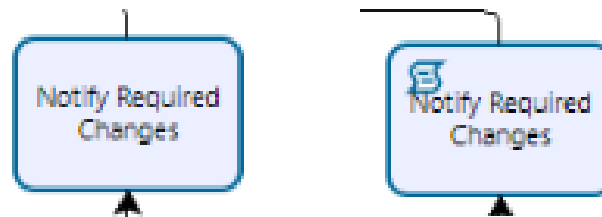
Figure 54.1: Before and After modifying the task type respectively [6]

3. **Process Documentation** included all relevant information for the process in the model with the detailed information. The user can add the meaningful information at the process by right-clicking on the element, or press F4 key to include the ***Diagram properties***. [6]
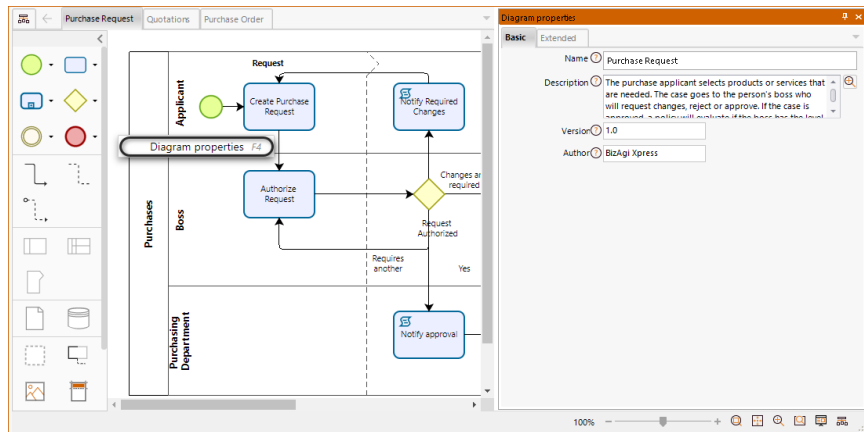
Figure 55: Include the Diagram properties [6]

4. Task Documentation included resources or a business entity that controls each task.
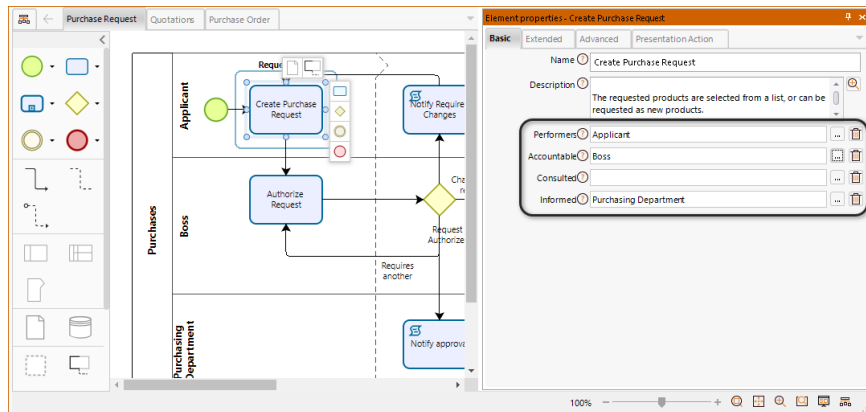
Figure 56: Task Documentation [6]

The user can define (add, edit, or delete) the resources of the model by clicking on the *Resources* option in the *Home* tab. [6]
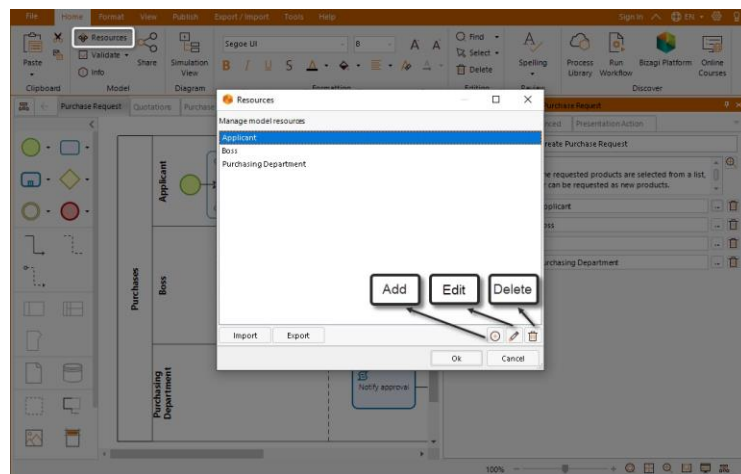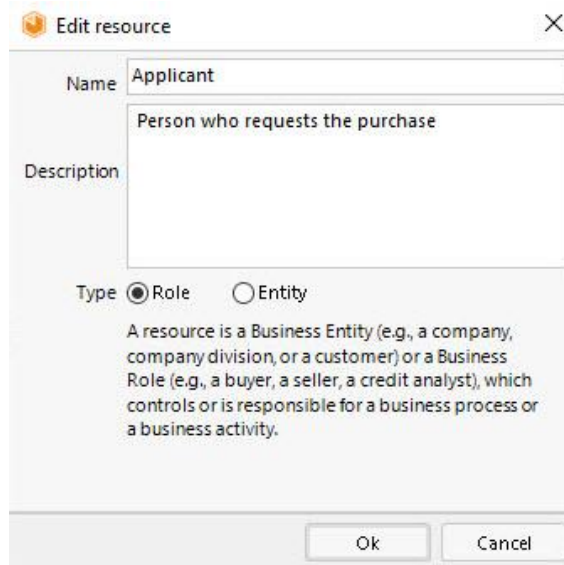
Figure 57: Add, edit, or delete the resources [6]

Then, select add and enter the name, description, and type of the resource. Once the user clicks **Ok**, the resource is created and associated with the given task role.

Figure 58: Adding description of the resource [6]

5. **Gateway Documentation** included the conditional expression for each decision branch. The user can define the conditions of the gateway by going to the advanced tab. In the **Gates table**. For instance, in the **Purchase Request** model the **Request Authorized** gateway has 4 outbound paths: No Changes are required, Requires another approval and Yes. [6]
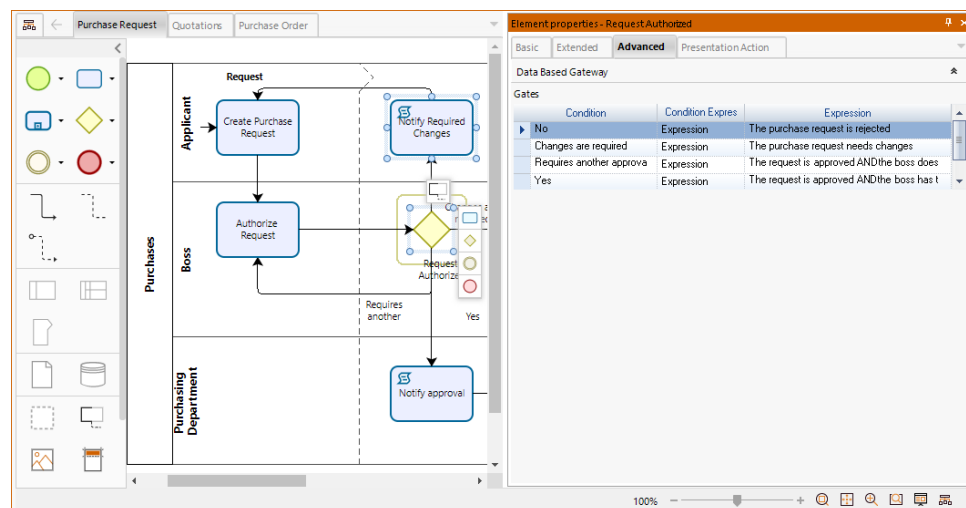
Figure 59: Gateway Documentation [6]

Pros and Cons

Pros	Cons
1. **Achieve results faster -** On data layer promotes reuse, the user can quickly share business objects across the processes.	1. **Lack of complex case control** - Although Bizagi offers the ability to manage both structured and unstructured processes, it still lacks complex case control. [13]
2. **Easy Integration -** Bizagi offers a simple and powerful integration layer (e.g., widgets, connectors) connecting multiple systems and applications. [Click here to search for more integration] [2] [32] 	2. **Minimal required dimensions** - compared to iBPMS vendors, Bizagi offers less intelligent products (e.g., Gartner Business Process IQ Framework). [13]
3. **Intuitive Interface -** The interface is user-friendly and suitable for every type of user regardless of technical knowledge.	
4. **Multi Language -** It provides many languages including English, Spanish, French, German, Russia, Dutch, Italian, Chinese, Japanese, and Portuguese.	
5. **Code-free forms** - The user can easily drag and drop the elements to create the process model without dealing with any hassle.	

Company or organizations that use them

Figure 60:Adidas's logo [15]

Customer: Adidas

Industry: Manufacturing & Retail

Location: Germany

Objectives: [15]

1. Glue process gaps across the corporation (ecommerce, operations, marketing, finance, and retail).

2. Centralize and improve the quality of supplier data.

3. Shorten authorisation cycles for Sports Assets Contracts.

4. Eliminate manual and inefficient PO change discussions.

Achievements: [15]

1. 87% faster contract approval cycle.

2. 60% reduction in operational supply chain costs.

3. Sports asset contract approval cycle reduced by 87.5% from 1-2 months to a week.

4. 50% reduction in factory onboarding time.

Figure 61: Deutsche Post DHL Group's logo [16]

Customer: Deutsche Post DHL Group

Industry: Transportation & Logistics

Location: Germany

Objectives: [16]

1. Connect disparate tech stack

2. End-to-end automation of VAT Duty Billing Process potential of RPA bots processing over 50,000 invoices a day.

3. Improve user experience and eliminate manual tasks.

Achievements: [16]

1. 95% automation pf Duty Billing Process.

2. 320,000 global users access VDM portal.

3. 2 million cases processed per year.

Figure 62: Unilever's logo [17]

Customer: Unilever International

Industry: Manufacturing & Retail

Location: Singapore

Objectives: [17]

1. Save time and increase efficiency of key processes.

2. Provide transparency of business processes.

3. Centralize marketing budgets to eliminate inconsistencies.

Achievements: [17]

1. Established workflows and clear user interfaces of process status.

2. Customer pricing framework cycle time reduced by 50%.

3. Centralized marketing budget system with tracker of actual vs planned spend.

Example how to use tool to create business processes

Step 1: First, the user needs to install Bizagi Modeler from:

https://www.bizagi.com/en/platform/modeler and register/log in to the account.
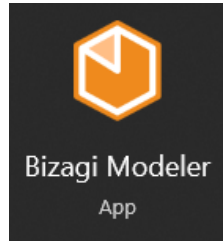
Figure 63: Bizagi Modeler Program

Step 2: Once the user opens the program, it will display this page showing an empty pool. The user can name the pool/process, and add more lanes to support the participants that are engaging in this process.
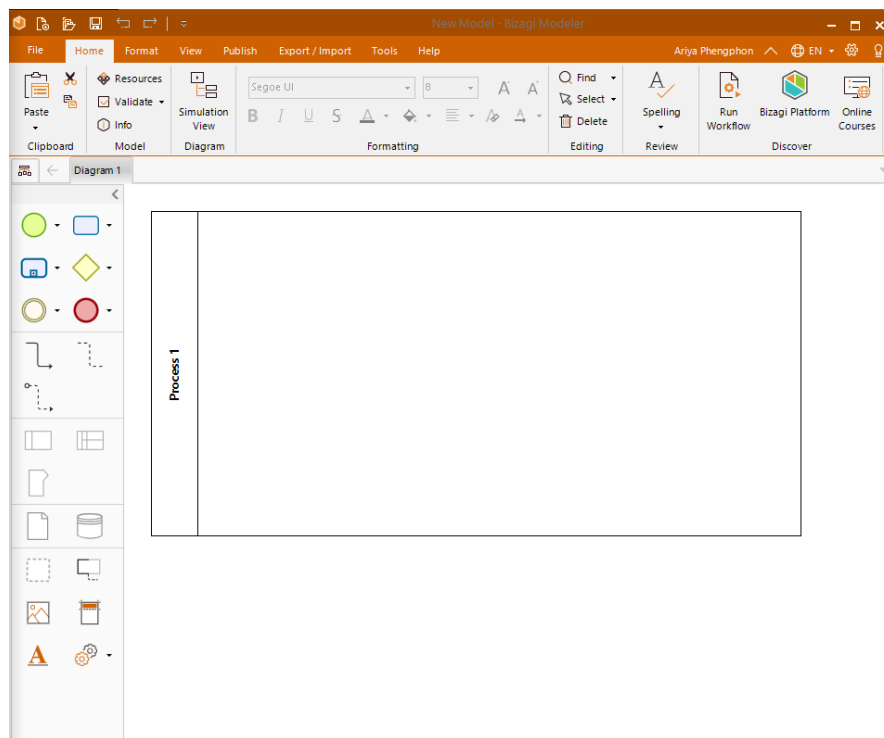
Figure 64: First page on Bizagi Modeler

Step 3: Next, after getting a pool and lanes, the user can easily drag and drop the elements on the left-hand side to the model. Usually, it will begin with the *Event* triggering where to start and end the process.
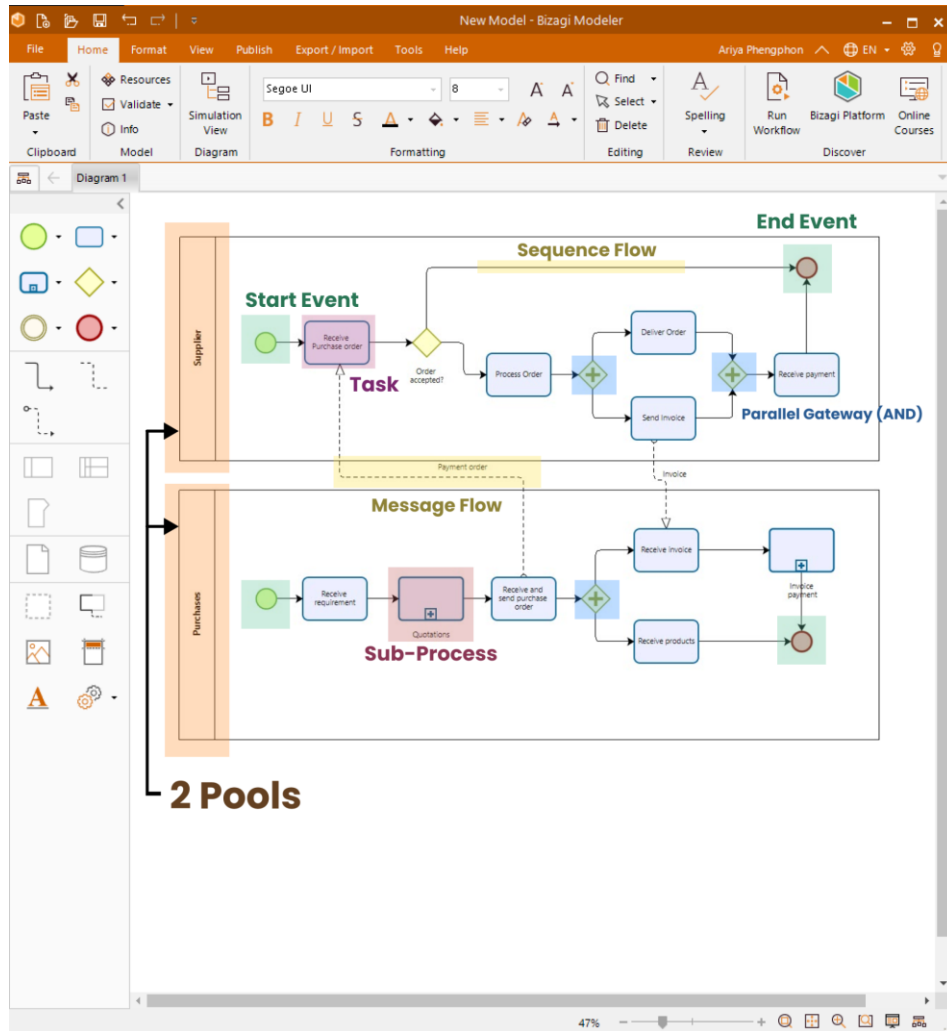
Figure 65: Elements on Bizagi

Tool 3 : Cardanit

Figure 66: Cardanit's logo

General Information

Cardanit is a collaborative modeling tool for business processes and decisions that was established in 2015 by the ESTECO R&D team, first known as BeePMN.[11] With Cardanit, it delivers a dynamic and frictionless modeling experience based on BPMN and DMN standards. Cardanit allows business analysts, consultants, and managers to utilize sophisticated and simple business process management editors to map their processes and expedite choices. [7]

How to use Cardanit tools

1. Drag and Drop Elements
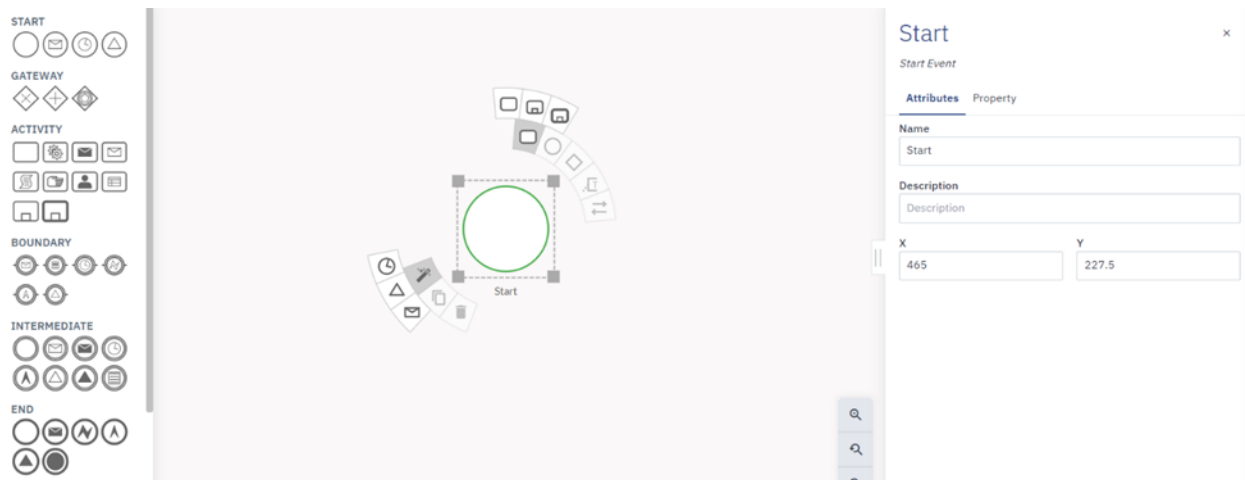
Figure 67: Drag and Drop Element

Using the drag and drop feature, the users may now be able to select BPMN symbols and move or align the objects into the canvas. Once an element has been placed on the canvas, we can now click on it to access its internal properties, change its name, and add a description to

each element in the right panel. The ring action would start to appear at this point. On the top right of the ring is the part for the user to continue modeling to add more symbols which will automatically choose the appropriate arrow for the user. The bottom left side of the ring would let the user operate on the chosen item, such as the magic wand, allowing the element to transform into a different type depending on the family set. [8]

2. Rectangular Selection

Figure 68: Rectangular Selection

The function known as "Rectangular Selection" enables the user to select and move on a particular region or choose a subset of the diagram.. [8]

3. Select All

Figure 69: Select All

Select All is a feature that allows users to select and move all of the components, either by highlighting the whole canvas or by choosing and moving all of the items within the same diagram. [8]
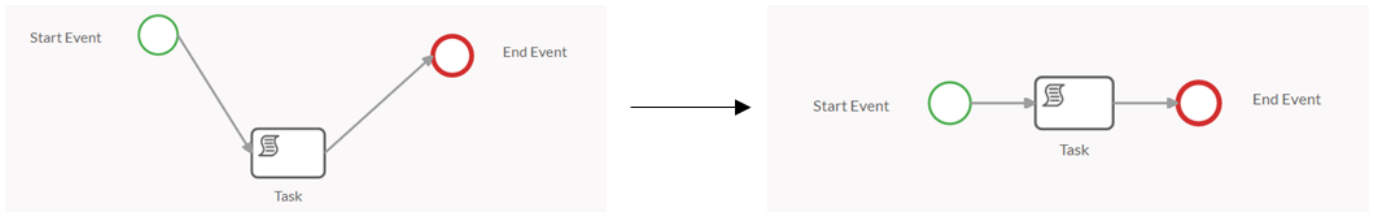
4. Auto layout tool

Figure 70: Auto Layout Tool Process

A brand-new feature called Auto Layout Tool enables users to automatically organize diagrams. Auto Layout consistently lines up and spaces all the elements and relationships in the

canvas, resulting in a visually consistent and clear layout which would save the user the time and effort of manually repositioning elements. [10]

5. Layout Customization

Figure 71: style the elements

Style is a fundamental activity that allows the user to add a splash of color to the elements and use their chosen font for labels and annotations to customize their processes. [10]
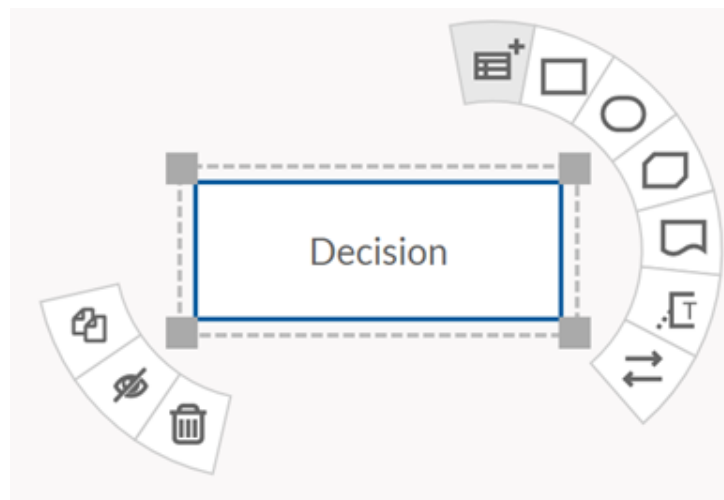
6. Business Rules

Figure 72: DCM Decision Table

The DMN Decision Tables, the initial step toward decision logic, are part of Cardanit's latest edition. Now you may define the business rules that control your decision model. By selecting the "add table" button in the ring of actions of the chosen element, you may link a table to Decisions and Business Knowledge Models. [10]

7. Capture and download diagram images

Figure 73: Download diagram image

The user would be able to download diagram images of the BPMN and DMN models using this toolbar. The icon displays a popup menu in which users can download images of a single diagram or all diagrams in a model. Users may also select a file type, including PDF or PNG, as well as conceal or reveal the project details box and the Cardanit logo.
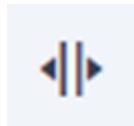
8. Create Space

Figure 74: Create Space

By dragging a Create Space tool, users may now be able to insert a space into a specific area horizontally and vertically on the canvas.
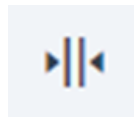
9. Remove Space

Figure 75: Remove Space

By pulling a Remove Space tool, users may now be able to delete a space of a specific area horizontally and vertically on the canvas.

Pros and Cons

Pros	Cons
1. **Cloud-Based Technology** - The user may access the whole workflow from any place at any time. [9]	1. **Not support multi languages** - Since Cardanit only supports English as the primary language, certain users who do not use English may be unable to access the service.
2. **Co-Creation features** - These features enable Cardanit users to exchange workflow and feedback with the team. [9]	2. **Lack of integration** - Due to Cardanit's lack of support for integration, applications like ABBYY Mobile Capture, Berexia, and Nividous cannot be used. [37]
3. **Intuitive graphical interface -** Cardanit provides an excellent user experience since the UI is simple and easy to use while developing the BDMS procedure with the auto layout. [9]	
4. **Automatic report generation -** Assist users in completing the paper faster. The report includes links, images, and comprehensive descriptions of the workflow. Make and distribute shareable model documentation. [9]	
5. **Version history -** In order to follow the production process step by step and to navigate back and obtain the most recent version, Cardanit offers a function that stores user history. [36]	

Company or organizations that use them

Figure 76: QUIN Logo [38]

QUIN, an Italian professional services company, uses Esteco Cardanit BPMN for Process Mining to examine and monitor business processes. [39]

In the year 2020, Quin obtained a wide range of new software tools from various organizations, including the Esteco Cardanit company, in order to carry out digital transformation initiatives. Quin intends to spend further and strengthen its connection with Esteco and other organizations in the near future as part of their broader Digital and IT transformation projects to remain competitive, defend against challenges from disruptive forces, or comply with internal requirements to enhance overall organizational efficiency. [40]

QUIN's revenues increased by $5.0 million in 2021 as a result of using the BPMN tools to help manage the business management workflow, as well as with the IT budget with an additional roadmap and cloud software purchases, aggregating enormous amounts of data points that serve as the foundation for the forecast assumptions. In order to improve the quality of technology and keep up with rapidly advancing disruptive technology, QUIN intends to invest in emerging technologies like AI, Machine Learning, IoT, Blockchain, and autonomous databases, as well as cloud-based ERP, HCM, CRM, EPM, Procurement, or Treasury applications. [40]

Example how to use tool to create business processes

Step 1: To begin, navigate to the Cardanit website at https://www.cardanit.com/. The user then logs in or registers as a new user. The web interface would then appear, as seen in Figure 76.
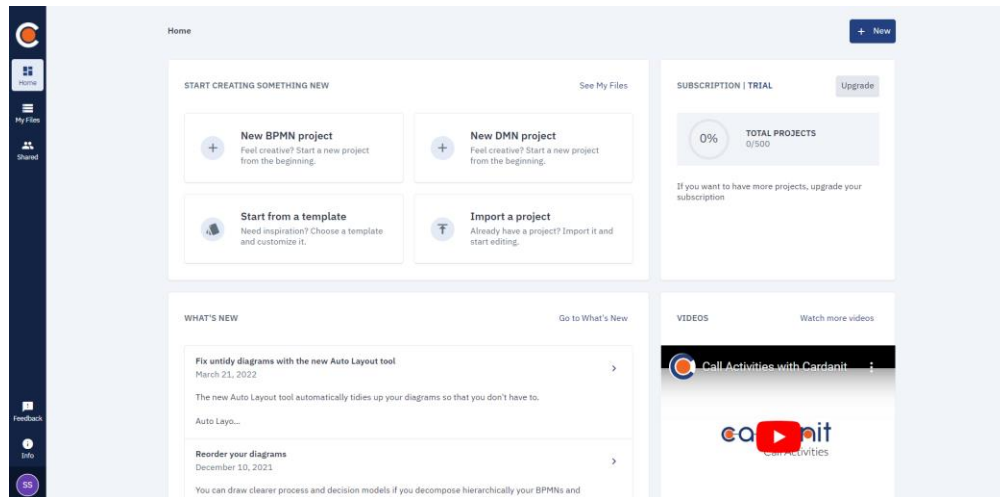

Figure 77: Cardanit Website [9]

Step 2: Then click on the "New" button and click on the BDMS project to start the canvas.
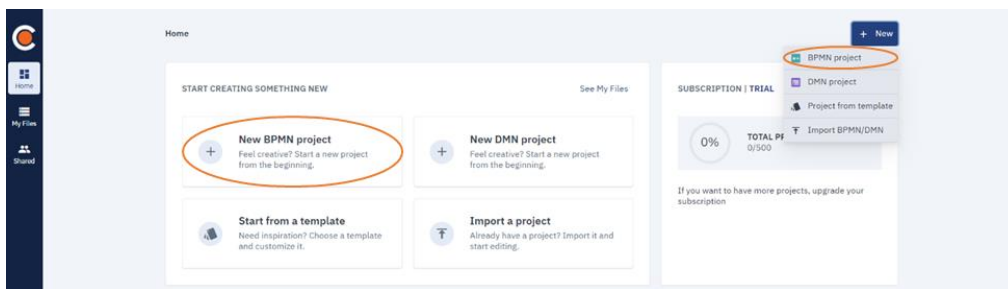

Figure 78: Cardanit's Homepage [9]

Step 3: Here is the Cardanit BDMS canvas, where the user may begin generating a BDMS diagram represented in figure 78. In addition, it also contains various BDMN elements for the user to drag and drop to start the process.
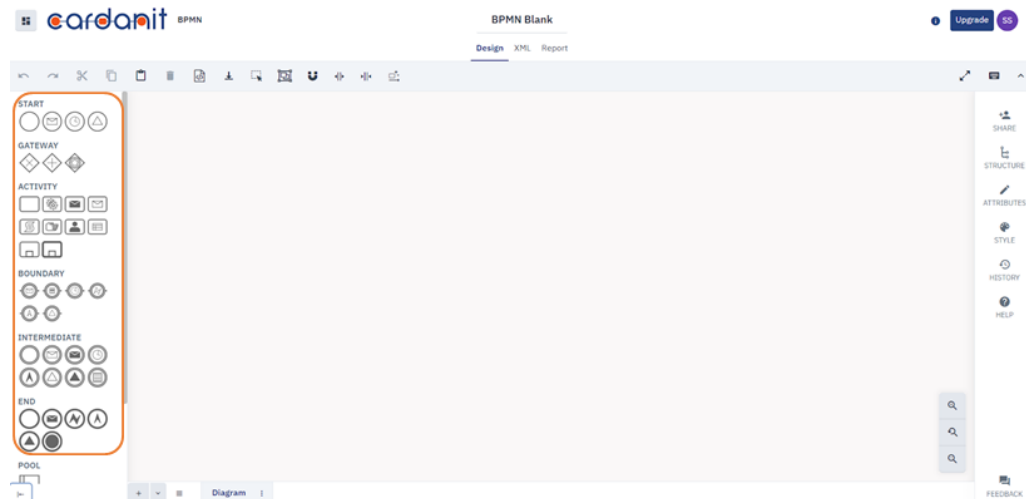

Figure 79: Cardanit's canvas [9]

Step 4: Finally, here is an illustration of a BDMS diagram that is used in library administration to deal with book-lending requests.
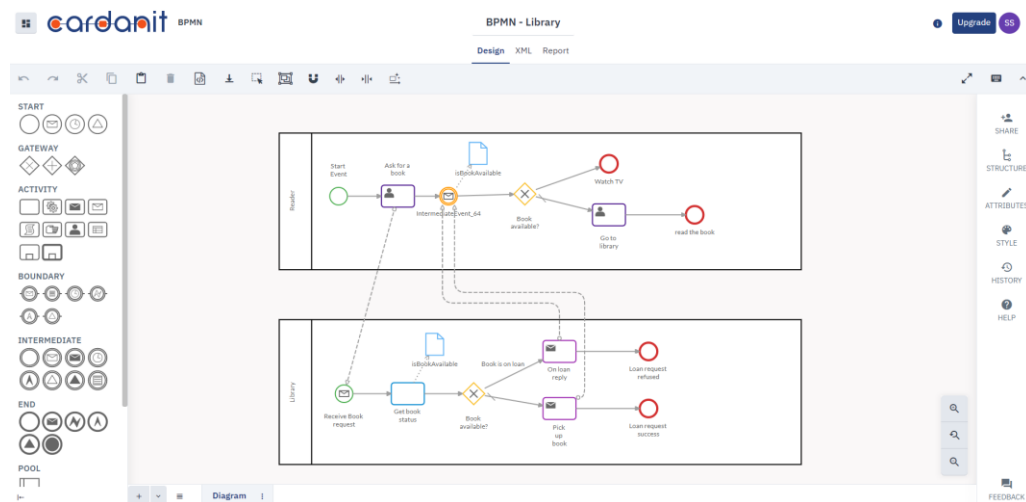

Figure 80: BDMS-Library process diagram [9]

Comparison table

Feature(s)	SIGNAVIO	bizagi	cardanit
Low-code functionalities	✅ Signavio has simple functionalities for users which *drag and drop* to build BPMN models.	✅ Bizagi provides *drag and drop* feature to build complex apps/model faster [29]	✅ Cardanit offers a *drag and drop* capability to make process design simple for the user.
Real-time Reports and Analytics	✅ Signavio has a *check function*. It will give a report of BPMN that users create.	✅ All of the *real-time analytics* will be continuously monitored. (e.g., easier to indicate the KPIs of the business) [30]	✅ The system helps users save time by assisting users with document completion.
BPMN 2.0 Compliance (A standard for BPM platform development)	✅ Signavio supports BPMN 2.0 and DMN 1.0.	✅ Bizagi supports *several standards* for process modeling (e.g., BPMN 2.0, XPDL) [31]	✅ The BPMN 2.0 and DIM 1.3 standards are supported by Cardanit.
Integration with other systems/applications	❌ Signavio has only one website. They don't provide any system or application integration services	✅ It is simple across multiple systems and applications. [32]	❌ Cardanit doesn't provide any system or application integration services.
Administrator permission setting	✅ Signavio has the admin to control user's authorization to use their website.	✅ They has a document overview stating the role of each level [34]	✅ In Cardanit, the admin has the ability to control each user's authorization.

Accessibility (e.g., loading process)	✅ Signavio has a moderate loading process because their web-based system is efficient.	❌ The loading process is quite *slow* when opening the program, and it requires the user to *download and register* before using the platform.	✅ The loading procedure is relatively fast and steady because Cardanit is available on an online platform that is simple to sign up for and register for.
Enterprise Collaboration	✅ Signavio Can made a deal for a big team for collaboration.	✅ Bizagi Modeler provides an *Enterprise plan* for collaboration. [33]	✅ With Cardanit, a user may make all of their workflows accessible to their team.
Mobile Optimisation	✅ Signavio is available for mobile devices where users can access the website from their mobile phone.	✅ They design the template based on the concept of *Mobile-first*. [30]	✅ Cardanit enables users to access the website from mobile devices.
Multi Language	✅ Signavio supports *4 languages*.	✅ The platform supports *10 languages*.	❌ The Cardanit platform is only available in English.
Intuitive UI	❌ Even though they provide the tutorial videos, it is troublesome to *find the contents* as it has many websites.	✅ The interface is *well-designed* and easy to understand.	✅ Cardanit provides an excellent user experience since the UI is simple and easy to use.

From the comparison table, it shows the different features of Signavio, Biazagi, and Cardanit. Each tool has their own main features that the other tools might not include, therefore the users are recommended to select the tools depending on their usages and purposes to receive the most effective model. For instance, if the user wants to work across many different platforms, Bizagi would be a good choice as it is the only platform out of three providing the integration.

Discussion and Conclusion

Discussion

In order to understand the importance of Business Process Model and Notation or BPMN, we have to look back and wonder how large businesses or organizations handle complicated systems and is there any method to represent a whole process in the business understandable for all of every section and department in that particular business and that is why people need BPMN. BPMN is a tool sort of flowchart that allows business owners or associated people in the business designs an abstract chart which depict how businesses perform processes and also know a whole picture of each step of what division has done a process.

The limitation of the report is that the team didn't explore all the features that the softwares has because it requires subscriptions and the cost is quite high. Moreover, it is impossible for the team to test the softwares in real usage such as the Analytics system and Integration system because it requires the real process model, time, and resources.

Conclusion

BPMN 2.0 is the current standard notation for Business Process Modeling. It helps stakeholders to understand the process and be able to collaborate with each other effectively. There are 4 types of symbols in BPMN 2.0 including flow objects, swimlanes, connecting objects, and artifacts.

According to the findings, Kissflow is the most used BPMN modeling software in 2022 followed by Process Maker, and Zoho Creator. All the top 10 BPMN modeling software has its own standout features such as integrations, user-friendly interface, and all of them have the common feature that the users drag and drop to create a process model. There are 3 softwares that are explained in detail including Signavio, Bizagi Modeler, and Cardanit.

As for the comparison among three BPMN modeling software, it's found that Bizagi is the best modeling software because it has all the required features, but the only drawback is that it's slow when a user opens the program. Signavio and Cardanit don't provide the integration system. Signavio has another disadvantage which is unfriendly user interface while Cardanit doesn't support multi-languages.

Finally, every BPMN softwares has their own stand out features. Since most BPMN softwares have similar features, it isn't important to users that they must always use the best software in the comparison table, they can use the software that has all features that they need and they are happy with it.

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