

CREATE MODEL: DEFECT DETECTION

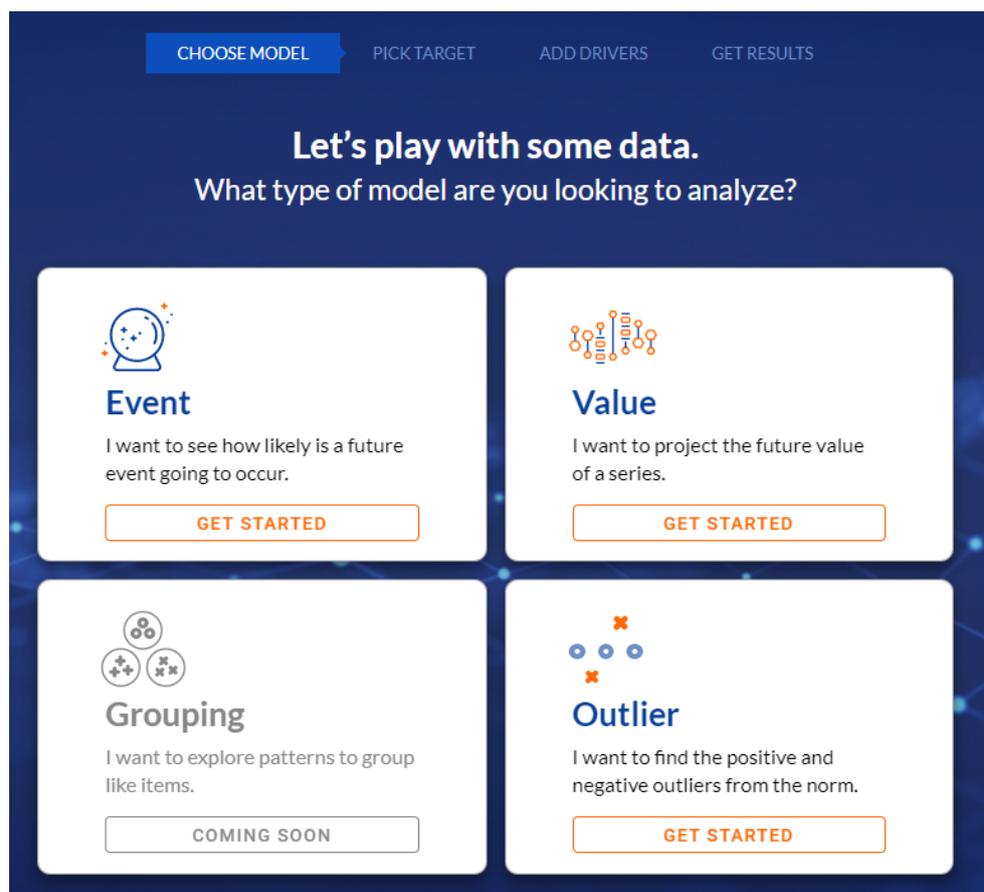
The following is a step by step guide to build and deploy a new model in the elipsa platform.

In the Defect Detection example, you will be building a model that takes the characteristics of the input materials, along with the settings of a processing machine, to determine whether the output will contain contaminants over an allowed threshold. With supervised machine learning, your data must contain a column that you are looking to predict. In this example, your machine data must contain a column consisting of the amount of contaminants in outputted materials from historical runs of your process.

Click the button to build a new model from the home screen or using the orange button on the top menu:

+ Build a New Model

Step 1: Select Get Started under Event



The screenshot displays the Elipsa AI platform's model selection interface. At the top, there are four navigation tabs: 'CHOOSE MODEL' (highlighted in blue), 'PICK TARGET', 'ADD DRIVERS', and 'GET RESULTS'. Below the tabs, the main heading reads 'Let's play with some data.' followed by the question 'What type of model are you looking to analyze?'. There are four model categories presented in white cards on a dark blue background:

- Event**: I want to see how likely is a future event going to occur. Includes a 'GET STARTED' button.
- Value**: I want to project the future value of a series. Includes a 'GET STARTED' button.
- Grouping**: I want to explore patterns to group like items. Includes a 'COMING SOON' button.
- Outlier**: I want to find the positive and negative outliers from the norm. Includes a 'GET STARTED' button.

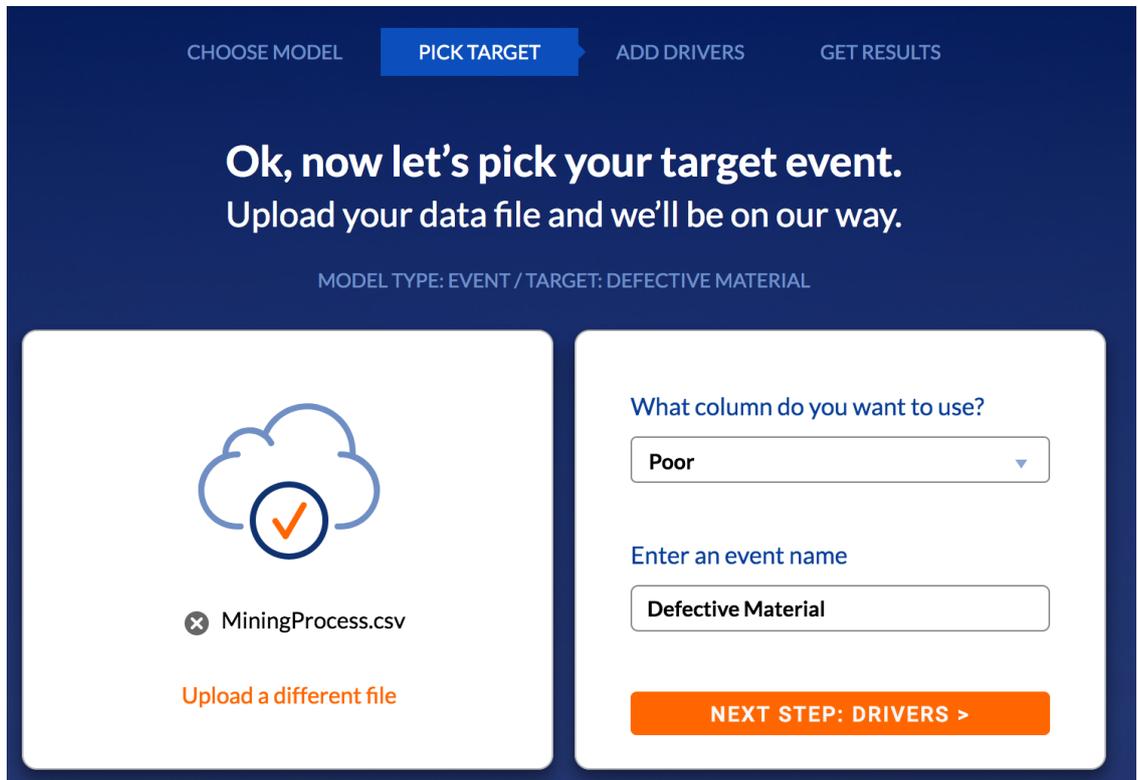
For the use case of Defect Detection, we will be building a model to predict an Event as we are trying to predict whether the % of Silica in the output will be over a safe threshold. As a result, click Get Started under the Event section

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CREATE MODEL: AIR QUALITY PREDICTION

Step 2: Upload Data and Select Target



The screenshot shows a web interface for creating an AI model. At the top, there are four navigation tabs: 'CHOOSE MODEL', 'PICK TARGET' (which is highlighted in blue), 'ADD DRIVERS', and 'GET RESULTS'. Below the tabs, the main heading reads 'Ok, now let's pick your target event. Upload your data file and we'll be on our way.' Underneath this, it says 'MODEL TYPE: EVENT / TARGET: DEFECTIVE MATERIAL'. The interface is split into two main sections. The left section features a cloud icon with a checkmark inside a circle, and below it, a file named 'MiningProcess.csv' is listed with a small 'x' icon to its left. Below the file name is a link that says 'Upload a different file'. The right section contains a dropdown menu with the question 'What column do you want to use?' and the word 'Poor' selected. Below the dropdown is a text input field with the label 'Enter an event name' and the text 'Defective Material' entered. At the bottom of the right section is an orange button that says 'NEXT STEP: DRIVERS >'. On the far left of the page, there is a decorative graphic consisting of a blue and yellow arc at the top, and a network of orange and red nodes connected by lines below it.

Upload File

Export your historical sensor data into csv format. Browse to the location of the file on your computer by clicking the button in the application or simply drag your file into the left hand size

Select the target column to predict

To build the Defect Detection model, you must have historical records of examples where the output from the process produced materials with % Silica over the allowed threshold as well as examples where the result was below the threshold. In our example, this is included in the column called 'poor'. On the right-hand side, we will select this column in the dropdown as our target that we are looking to predict. Below the dropdown, enter the name that you want to use to describe the event that you are predicting.

Click Next Step: Drivers

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Step 3: Select columns to use as predictors

CHOOSE MODEL PICK TARGET **ADD DRIVERS** GET RESULTS

Which columns are we going to use as predictors?

MODEL TYPE: EVENT / TARGET: DEFECTIVE MATERIAL

Columns	<input type="checkbox"/> Select all	<input type="checkbox"/> Deselect all	Predictors	Reset
<input type="checkbox"/> date			<input checked="" type="checkbox"/> % Iron Feed	
<input checked="" type="checkbox"/> % Iron Feed			<input checked="" type="checkbox"/> % Silica Feed	
<input checked="" type="checkbox"/> % Silica Feed			<input checked="" type="checkbox"/> Starch Flow	
<input checked="" type="checkbox"/> Starch Flow			<input checked="" type="checkbox"/> Amina Flow	
<input checked="" type="checkbox"/> Amina Flow			<input checked="" type="checkbox"/> Ore Pulp Flow	
<input checked="" type="checkbox"/> Ore Pulp Flow			<input checked="" type="checkbox"/> Ore Pulp pH	
<input checked="" type="checkbox"/> Ore Pulp pH			<input checked="" type="checkbox"/> Ore Pulp Density	
<input checked="" type="checkbox"/> Ore Pulp Density			<input checked="" type="checkbox"/> Flotation Column 01 Air Flow	
<input checked="" type="checkbox"/> Flotation Column 01 Air Flow			<input checked="" type="checkbox"/> Flotation Column 02 Air Flow	
<input checked="" type="checkbox"/> Flotation Column 02 Air Flow			<input checked="" type="checkbox"/> Flotation Column 03 Air Flow	
<input checked="" type="checkbox"/> Flotation Column 03 Air Flow			<input checked="" type="checkbox"/> Flotation Column 04 Air Flow	
<input checked="" type="checkbox"/> Flotation Column 04 Air Flow			<input checked="" type="checkbox"/> Flotation Column 05 Air Flow	
<input checked="" type="checkbox"/> Flotation Column 05 Air Flow				

Driver count: 21

CREATE MY MODEL!

In this step, you will select the columns from your input file that you want to use to predict your target. In other words, select the columns that will predict what the % Silica Concentration will be in the output.

In many cases, you will want to select all columns that you exported. You can easily do this with the select all button on the left pane. All selected columns will appear in the right pane and can be removed by clicking the X icon on the right or toggling the checkbox on the left.

Note that often times when using machine data the data is in a time series format. Be careful about including date and time columns as predictors as you will be specifying to the system that the time or date is potentially important in determining the output.

Our suggestion is to avoid including date/time as predictors for most use cases, unless you believe it is an important factor.

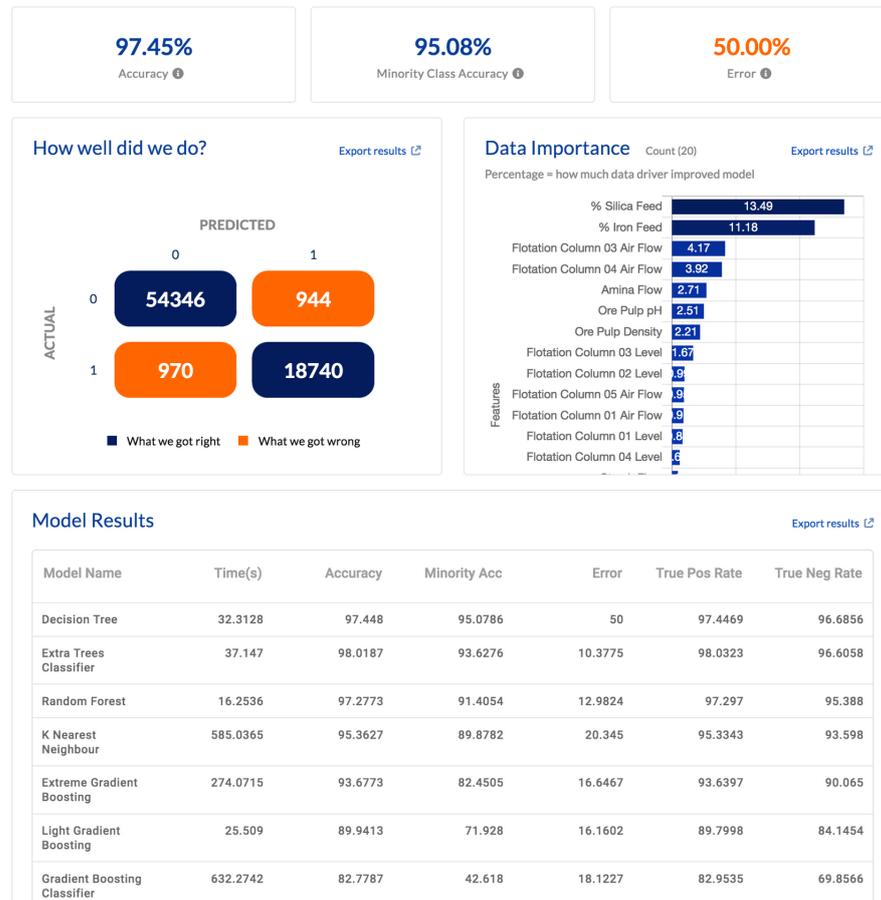
Click Create Model

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Step 4: Review and Save Model



Once the model is built, the system will return metrics to help you better understand your model. For more information on the metrics, please look at the guides related to Model Metrics.

The time to create a model is dependent on the size of your dataset. This file for example could take ~30 minutes to build the model. Calculations will be performed in the background and an email alert will be sent when the model is created.

At this point in the process, there are options as to what you can do with the model. These options can be performed by the three buttons at the top right.

Click to Improve Model

First, you can click to Improve the Model. By clicking this, the system will take the best performing model and it will try to further improve it by trying a series of different configurations to see if it results in higher data prediction accuracy. This process is known as model tuning. This process could take up to an hour to run but all calculations will be performed in the background and you will be alerted when the model is complete.

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Click to Make Predictions

In addition, you can click to Make Predictions in the user interface. This allows you to try to make predictions on new data through the UI. You will not be able to make predictions via API until the model is saved. For more information on predictions, please check out our guides.

Click to Save Model

By clicking save model, you are saving the model for future predictions in the system as well as via API. Unsaved models are only retained in the system for 24 hours.

