Build a self-managing enterprise with system dynamics

Kim Warren

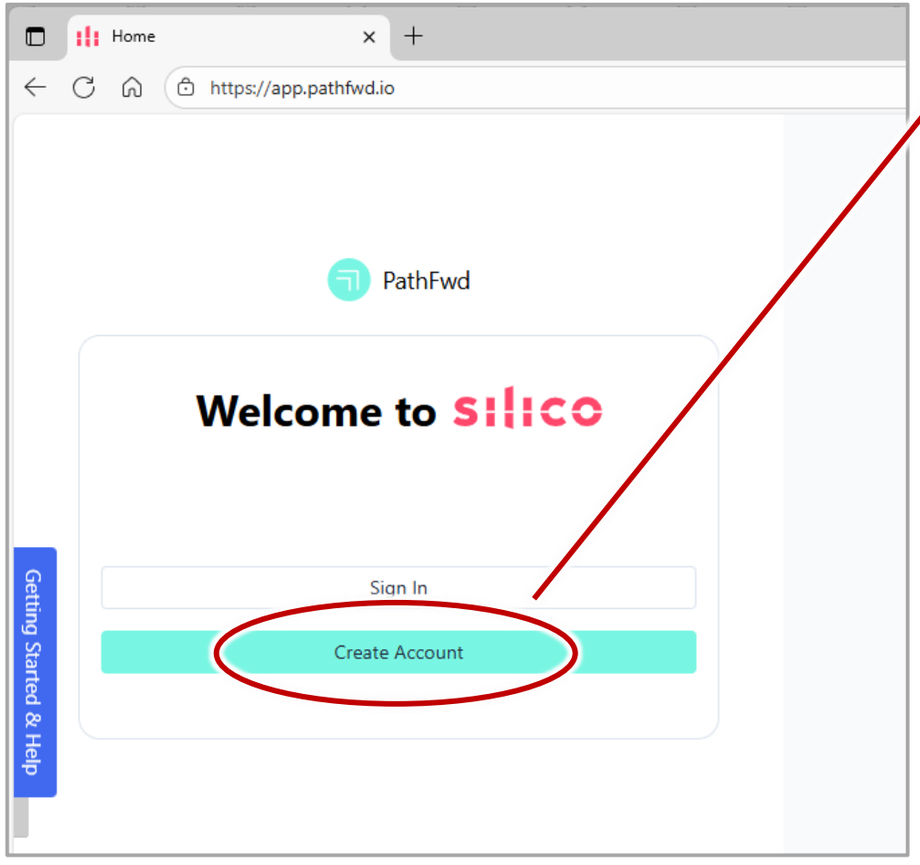
These slides at sdl.re/buildAI-SME

(*How agentic-AI leads to the self-managing enterprise …* sdl.re/AIshowITS)

sdcourses.com

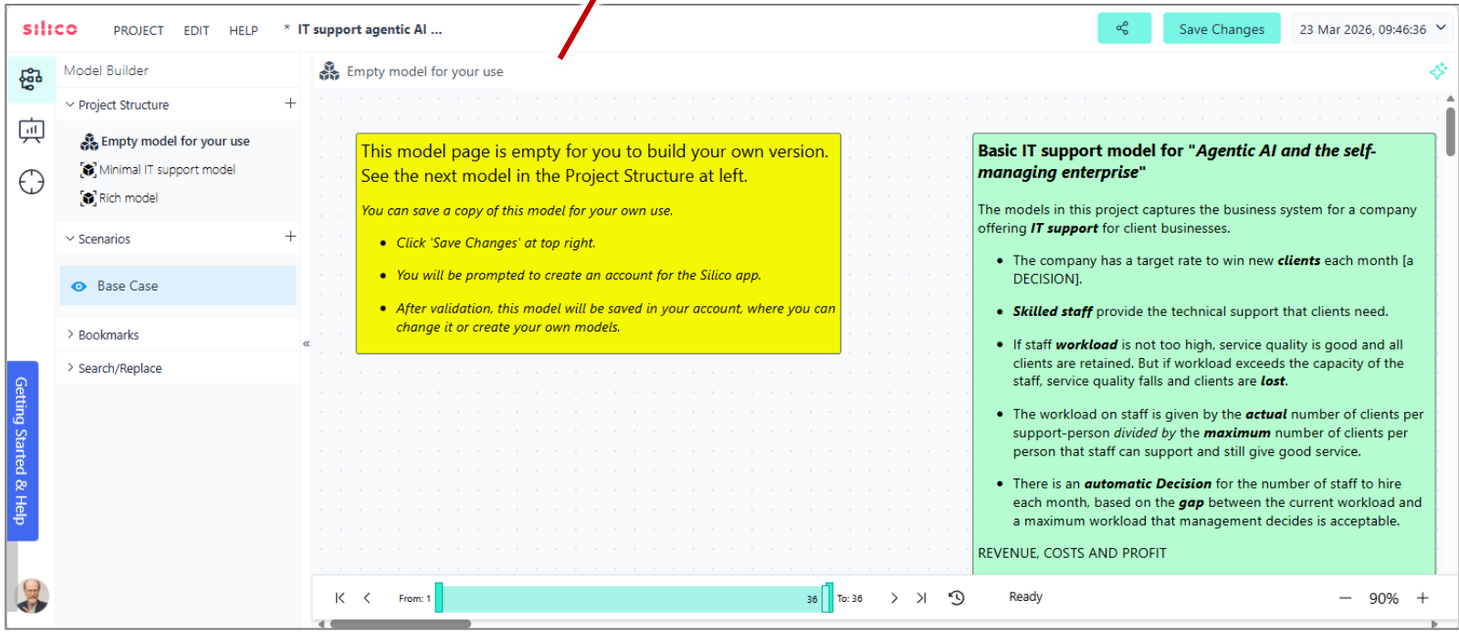
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Go to sdl.re/AI*model*ITS …



Create a Silico account

The project modeling screen opens



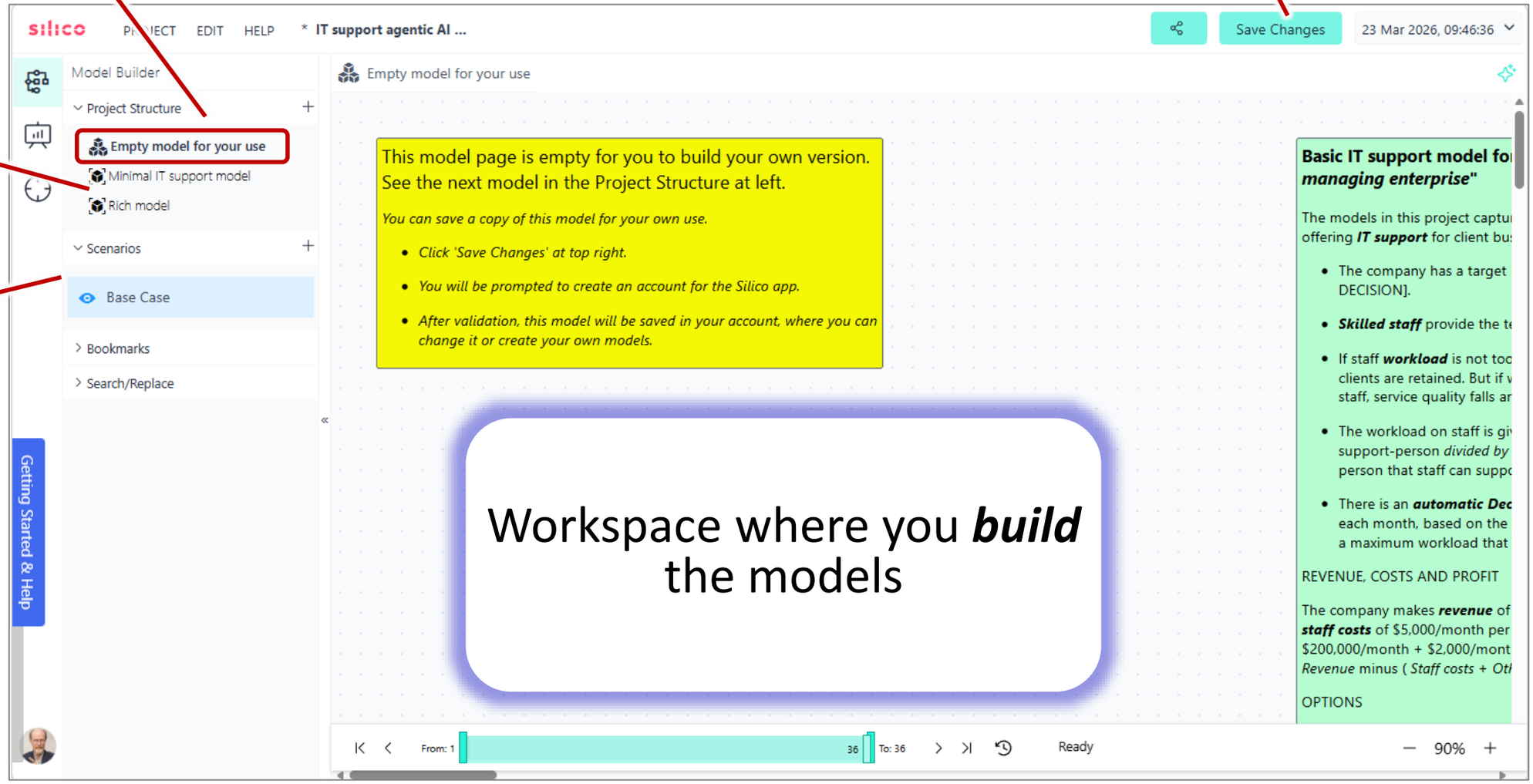
You should see …

The current model

Save project to your Cloud account

Complete models

Create scenarios



Workspace where you ***build*** the models

Change project time-settings

Back to see all your projects

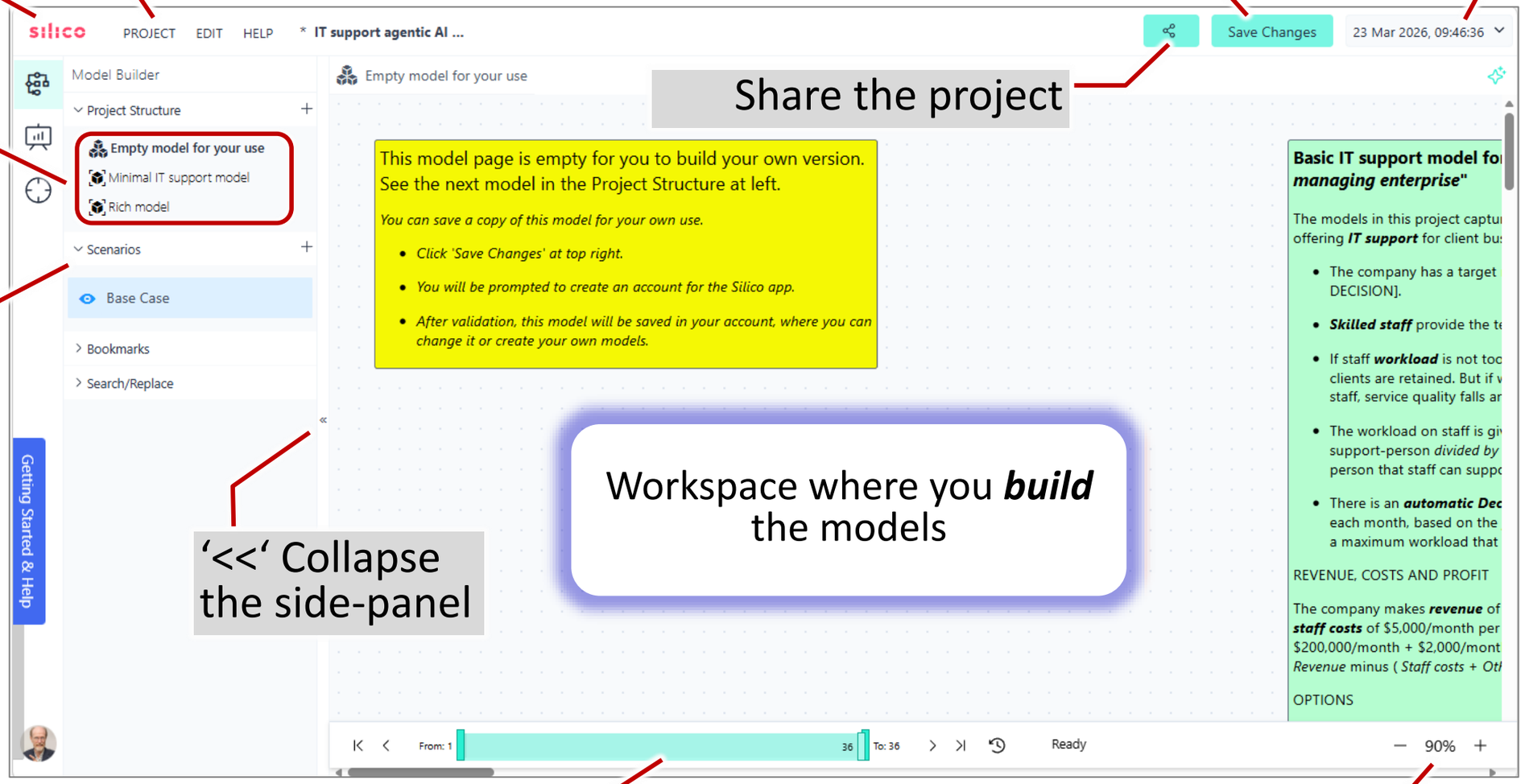
List of models in the project

Create scenarios

Save project to your Cloud account

Version history at every 'Save'

Share the project



Workspace where you ***build*** the models

'<<' Collapse the side-panel

Time-bar - where you are in the model's time range

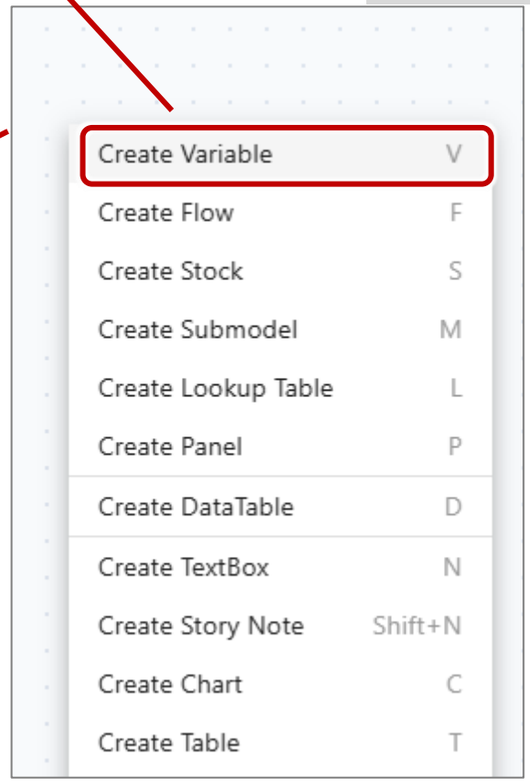
Zoom and scroll your view of the model

Add a Variable for growing Revenue

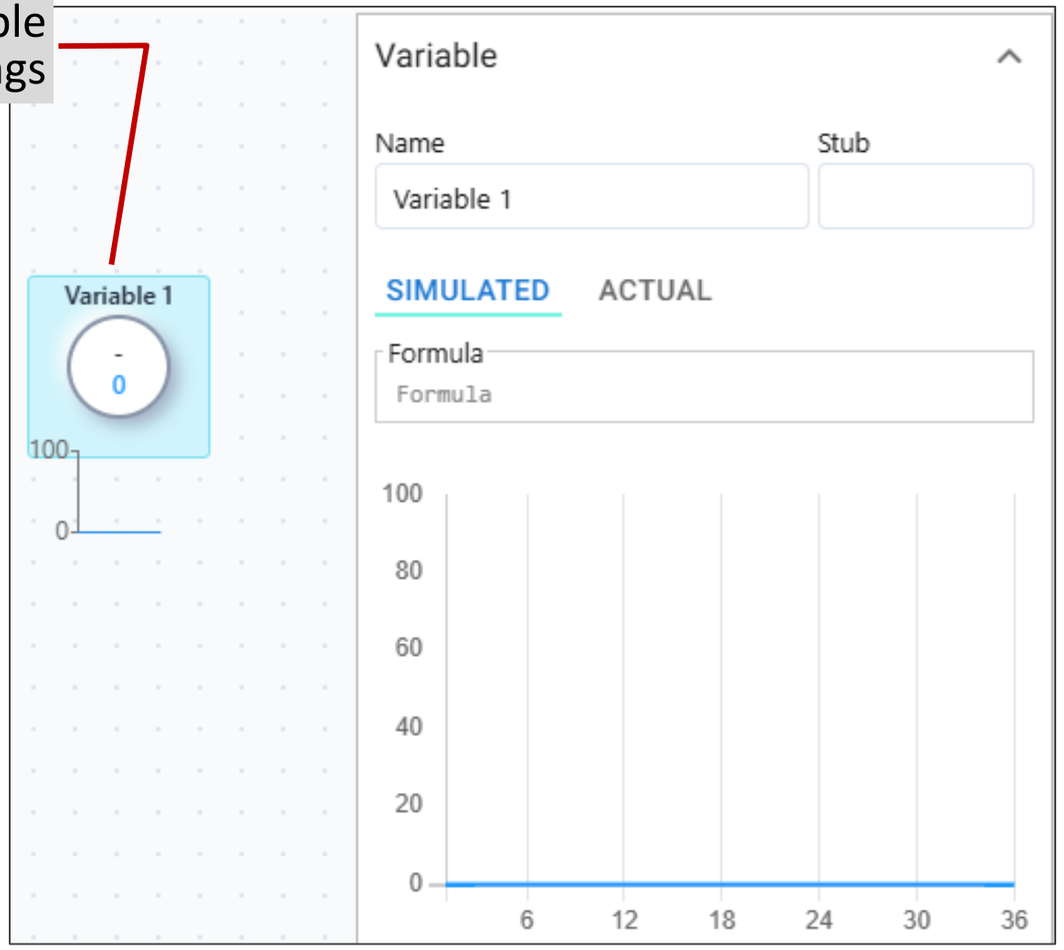
At upper-right of the Workspace …

1. Right-click .. choose ‘Create Variable’

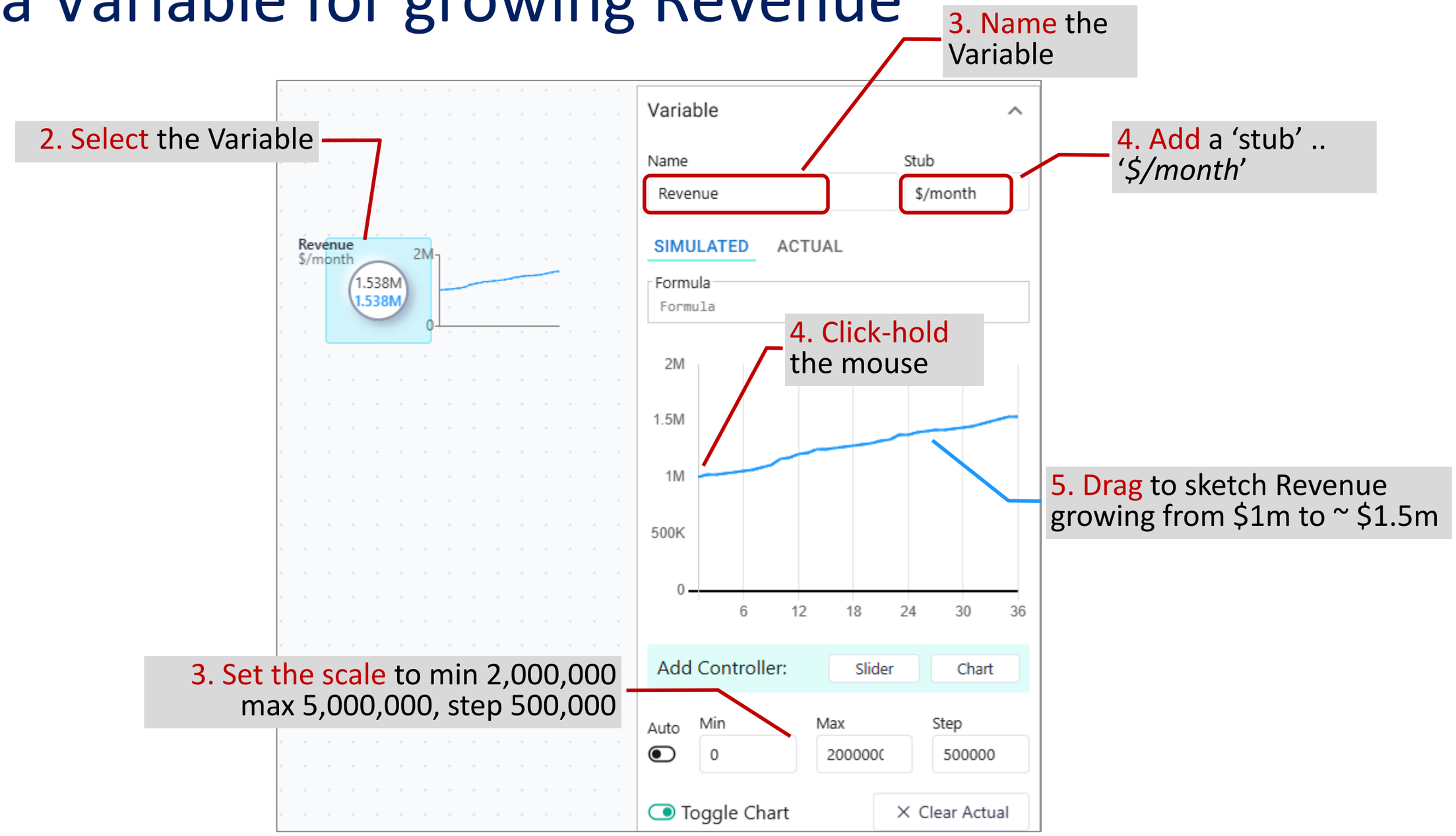
… OR just hit ‘**V**’ to add a Variable at this location



2. Select the Variable to display its settings



Add a Variable for growing Revenue

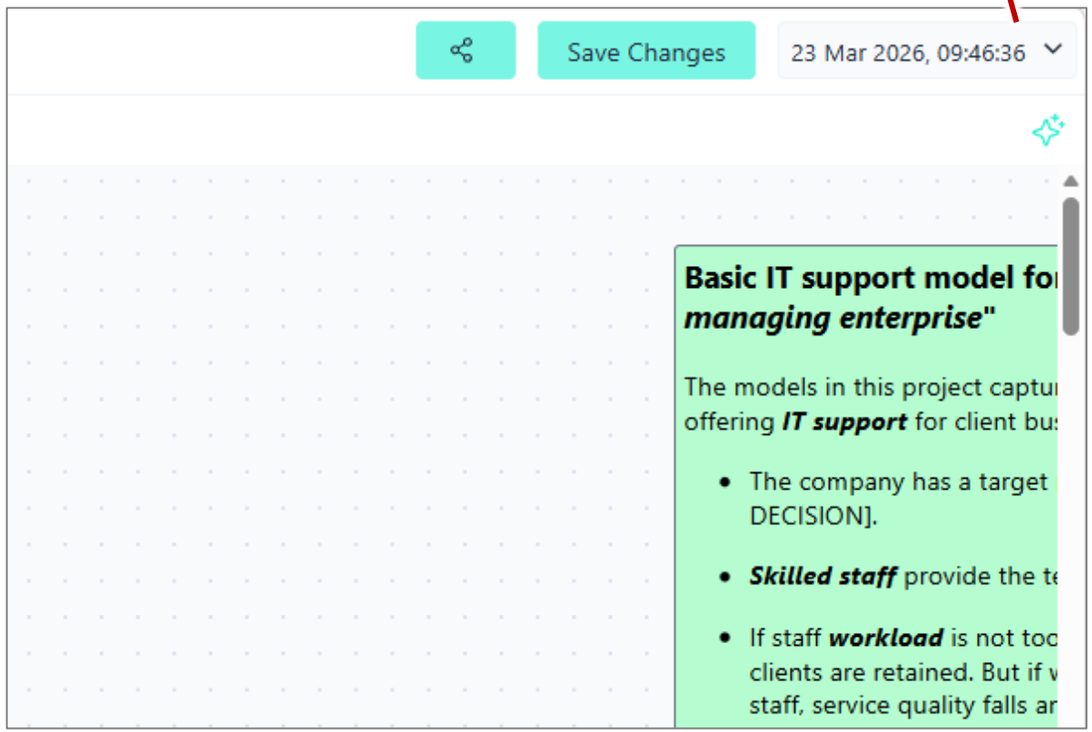


Mistakes ? …

Ctrl-Z ***undoes*** any number of steps since the last Save

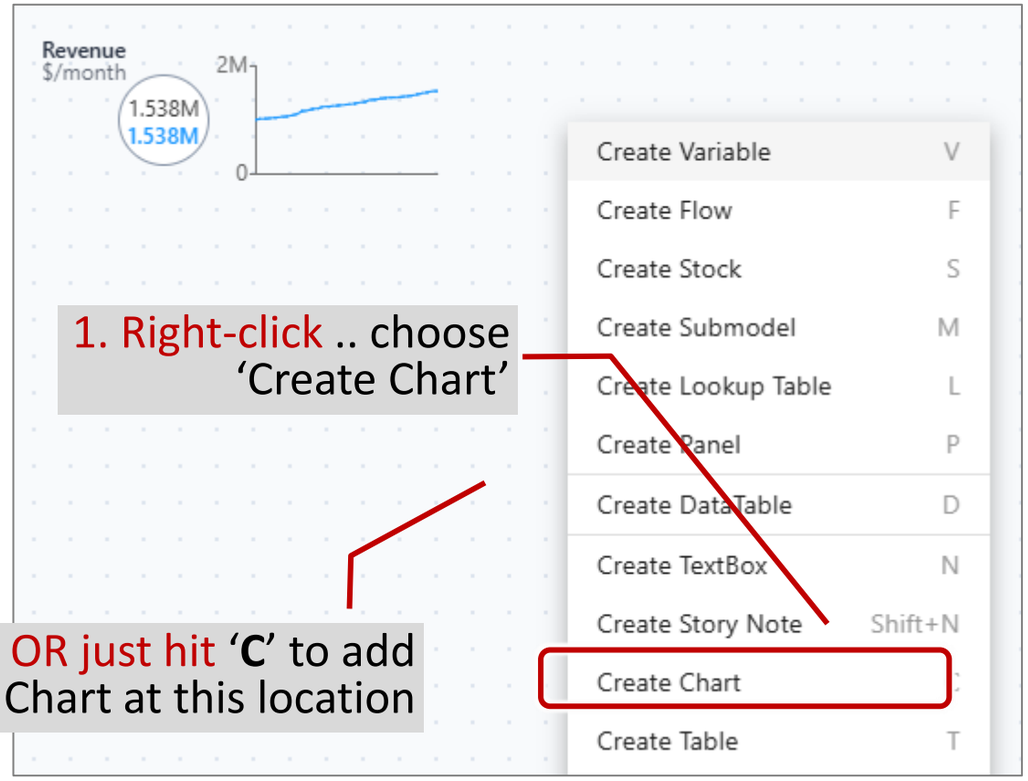
Ctrl-Y ***redoes*** any number of steps

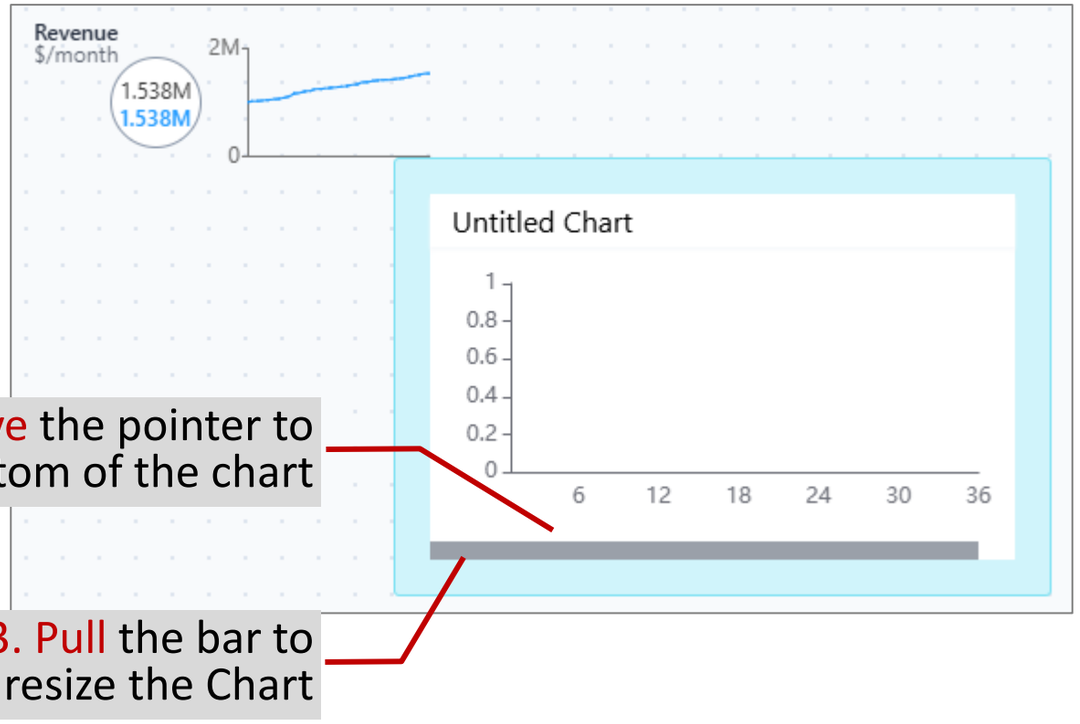
… or open past Versions



Add a Chart

Below-right from the Variable …

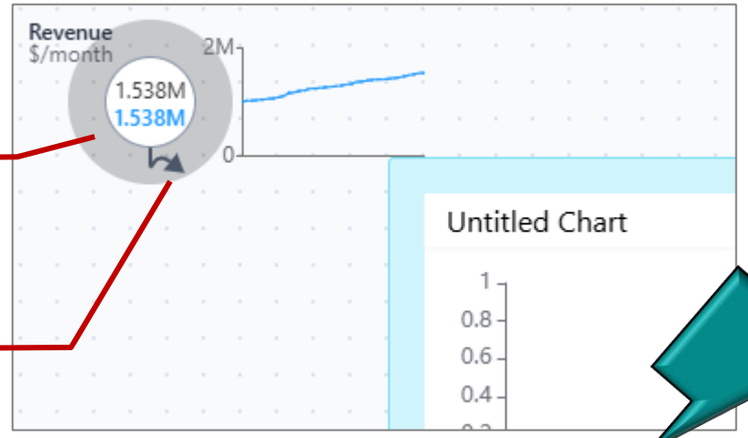




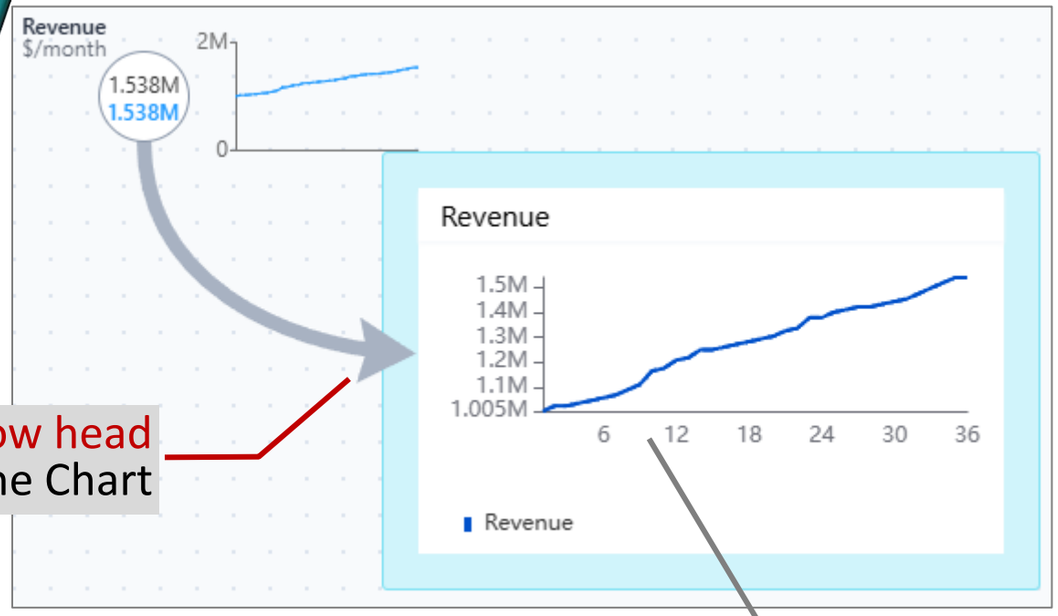
Add ‘Revenue’ to the Chart

1. Move the pointer close to the Variable – a ‘cloud’ appears

2. Click-hold in the cloud – a link-arrow is started

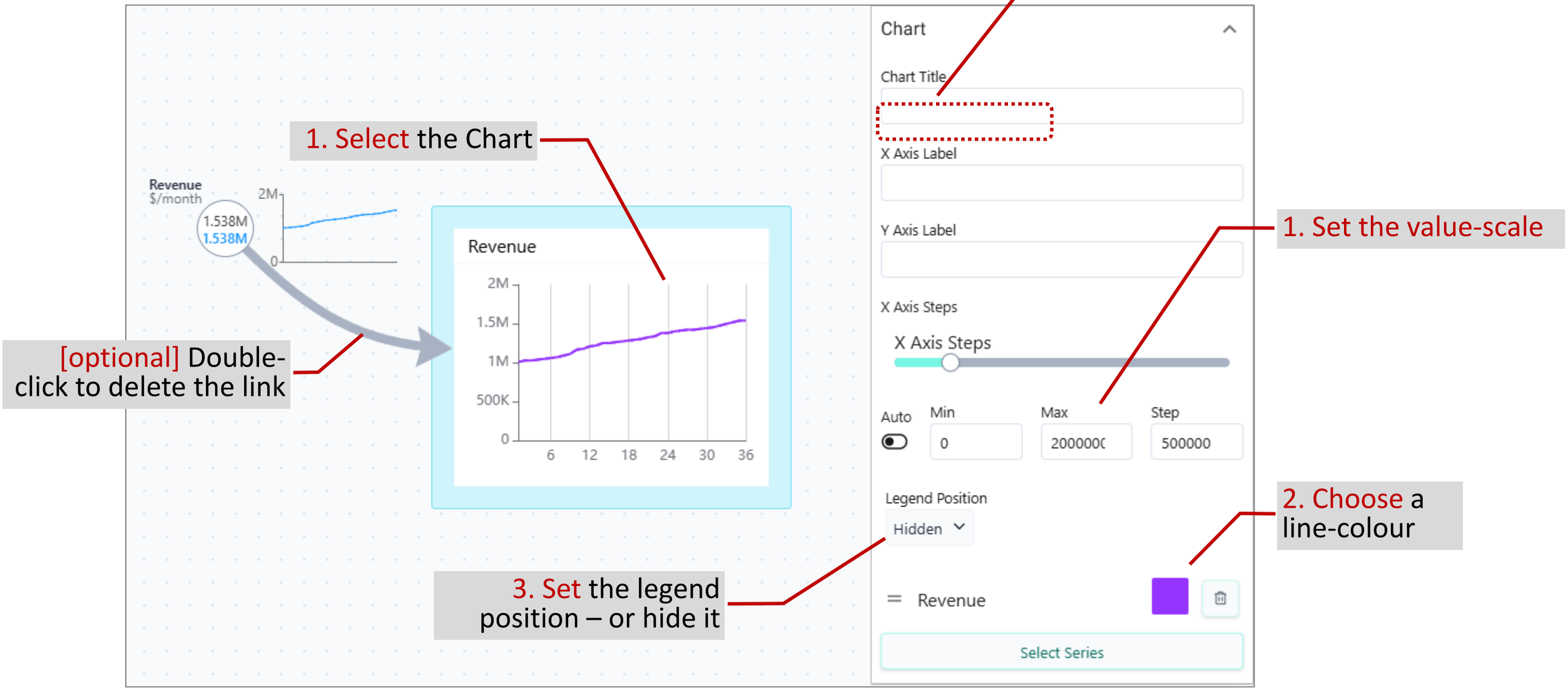


3. Drag the arrow head ***into*** the Chart



The values for ‘*Revenue*’ are added to the Chart + its name as Title + a legend

Edit the Chart for growing Revenue



Add '*Revenue per client*'

1. Add another Variable

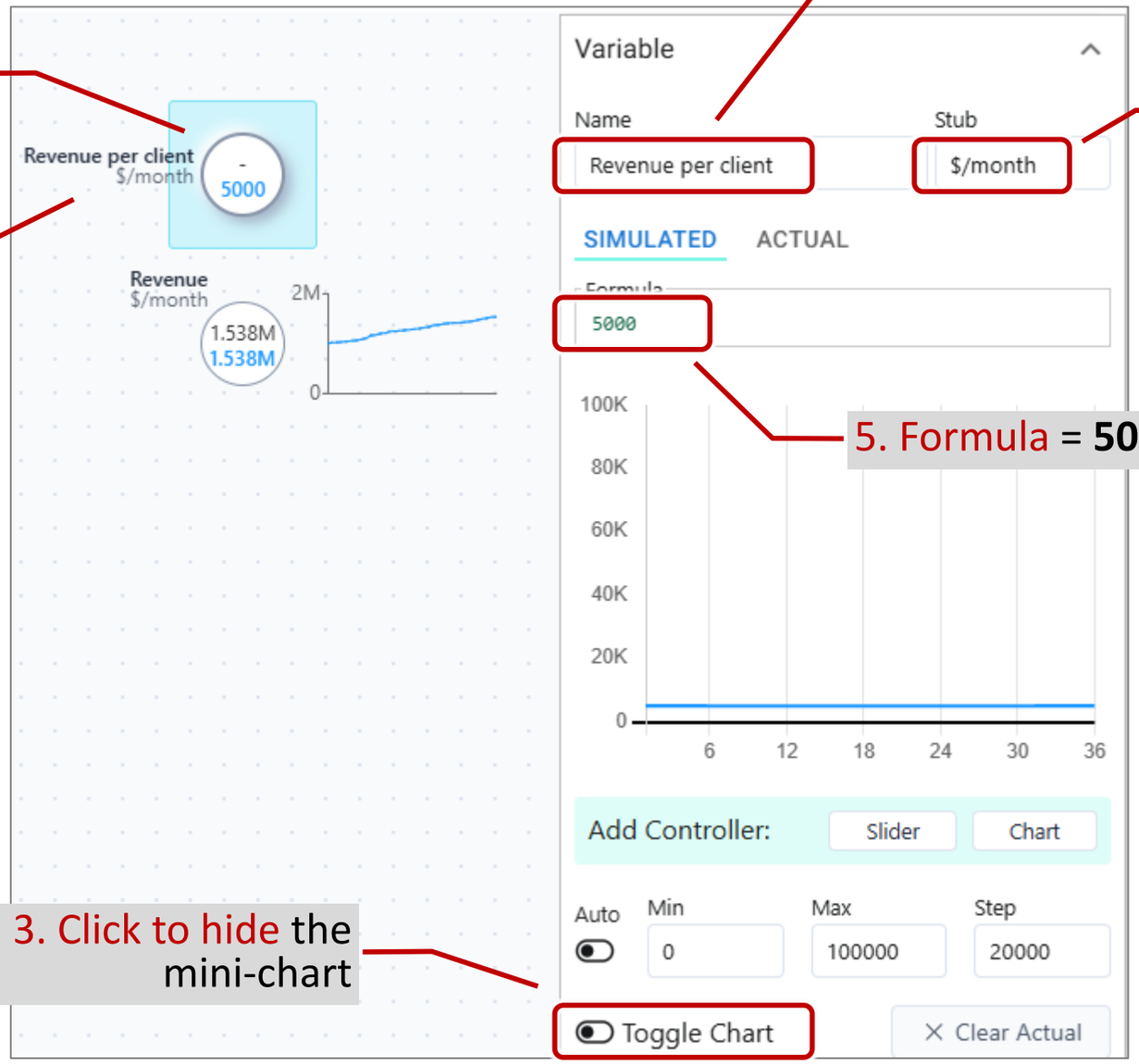
2. Drag its name to the left

3. Name the Variable

4. Add a 'stub' .. '*$/month*'

5. Formula = **5000**

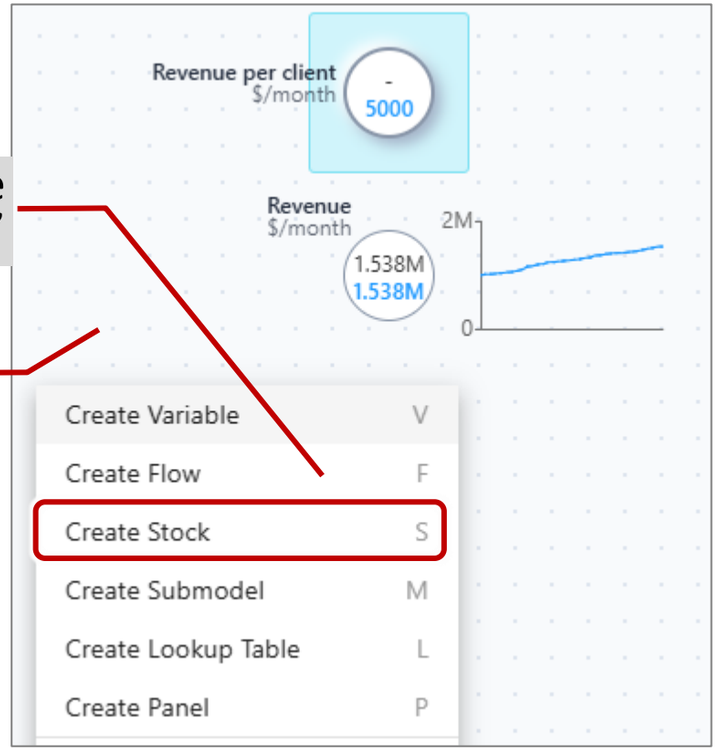
3. Click to hide the mini-chart

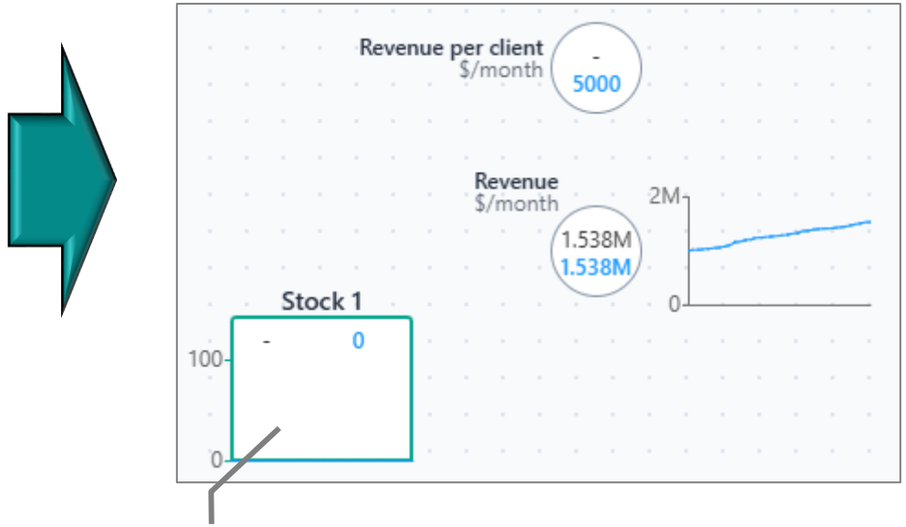


Add a growing stock of Clients

1. Right-click .. choose ‘Create Stock’

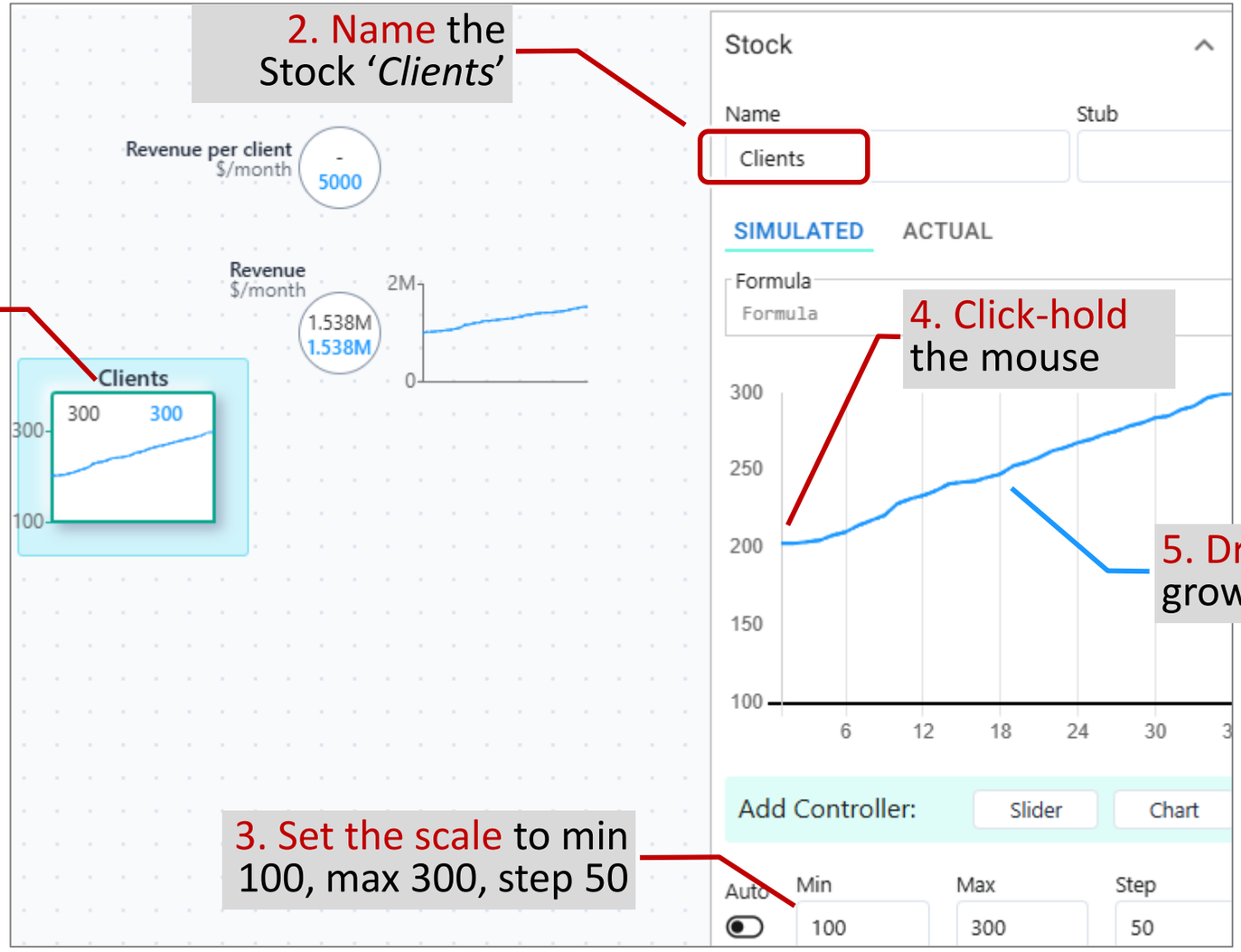
… OR just hit ‘**S**’ to add a Stock at this location





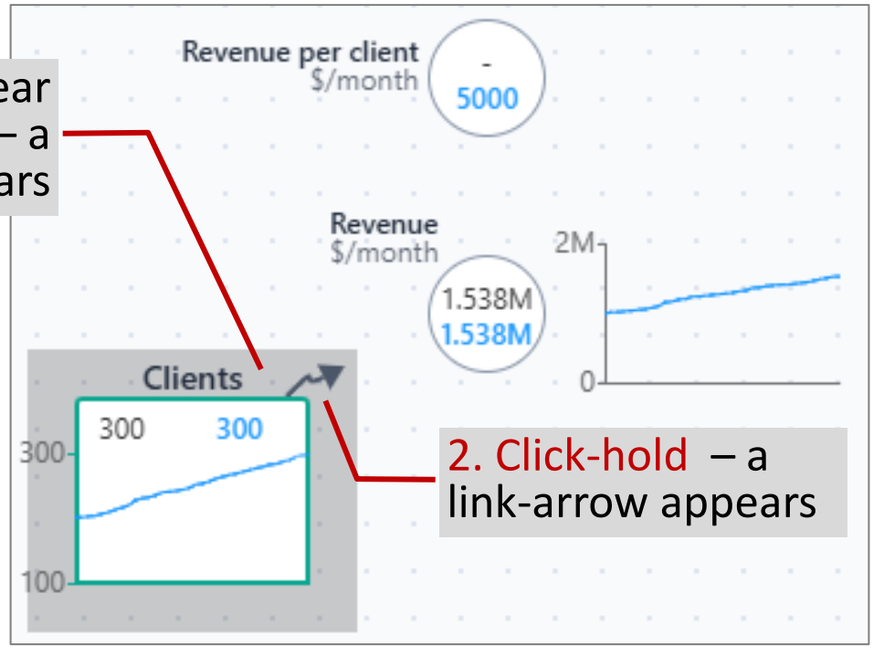
A Stock object is added

Add a growing stock of Clients



Link items to enable calculations

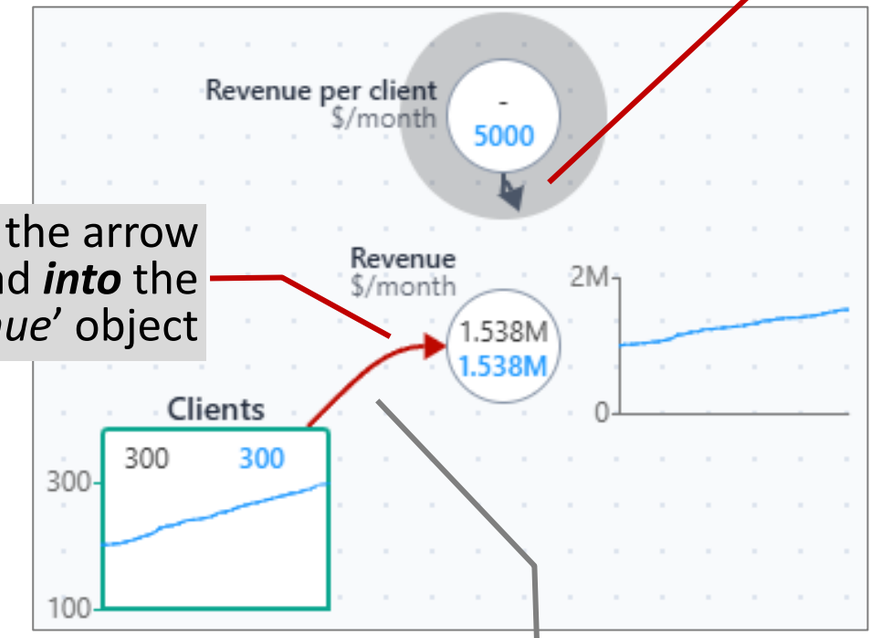
1. Place pointer near the '*Clients*' stock – a 'cloud' appears



2. Click-hold – a link-arrow appears

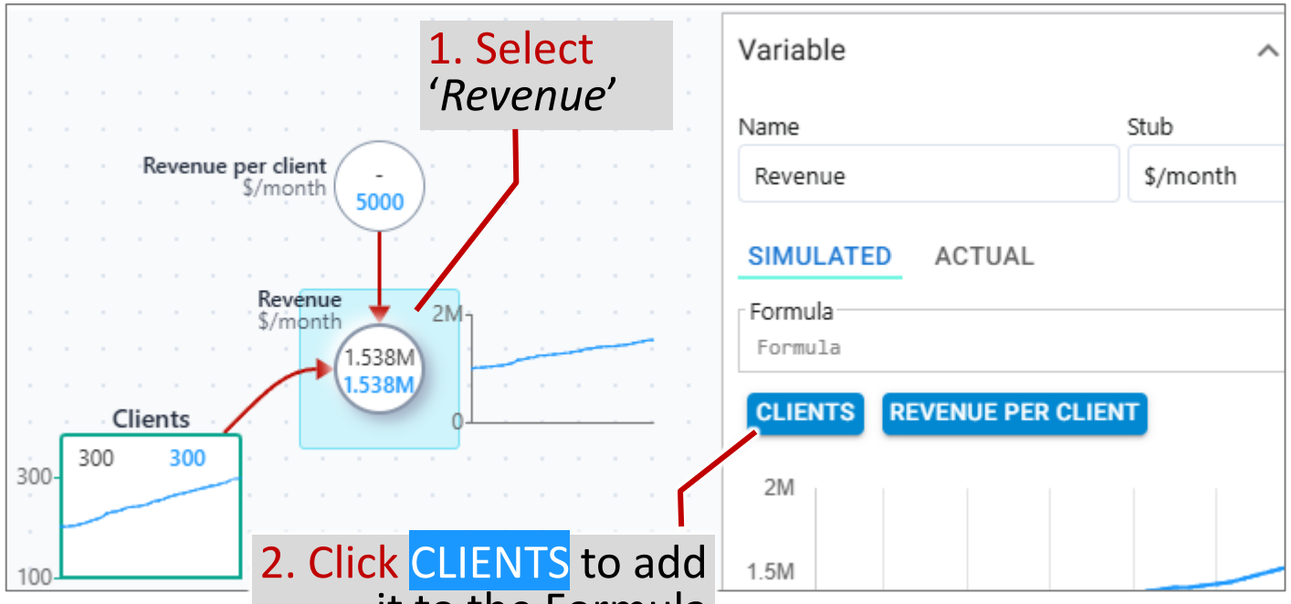
4. Repeat to link '*Revenue per client* to '*Revenue*'

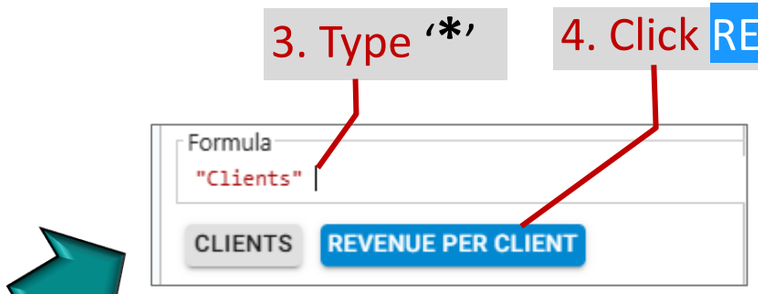
3. Drag the arrow head ***into*** the '*Revenue*' object



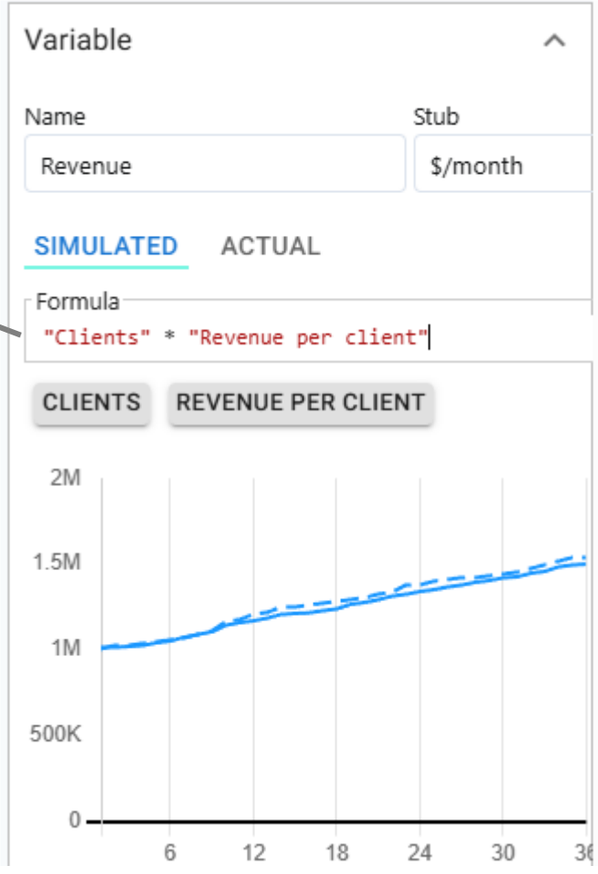
The link is made, but red says it is not yet used to calculate Revenue

Calculate ‘*Revenue*’

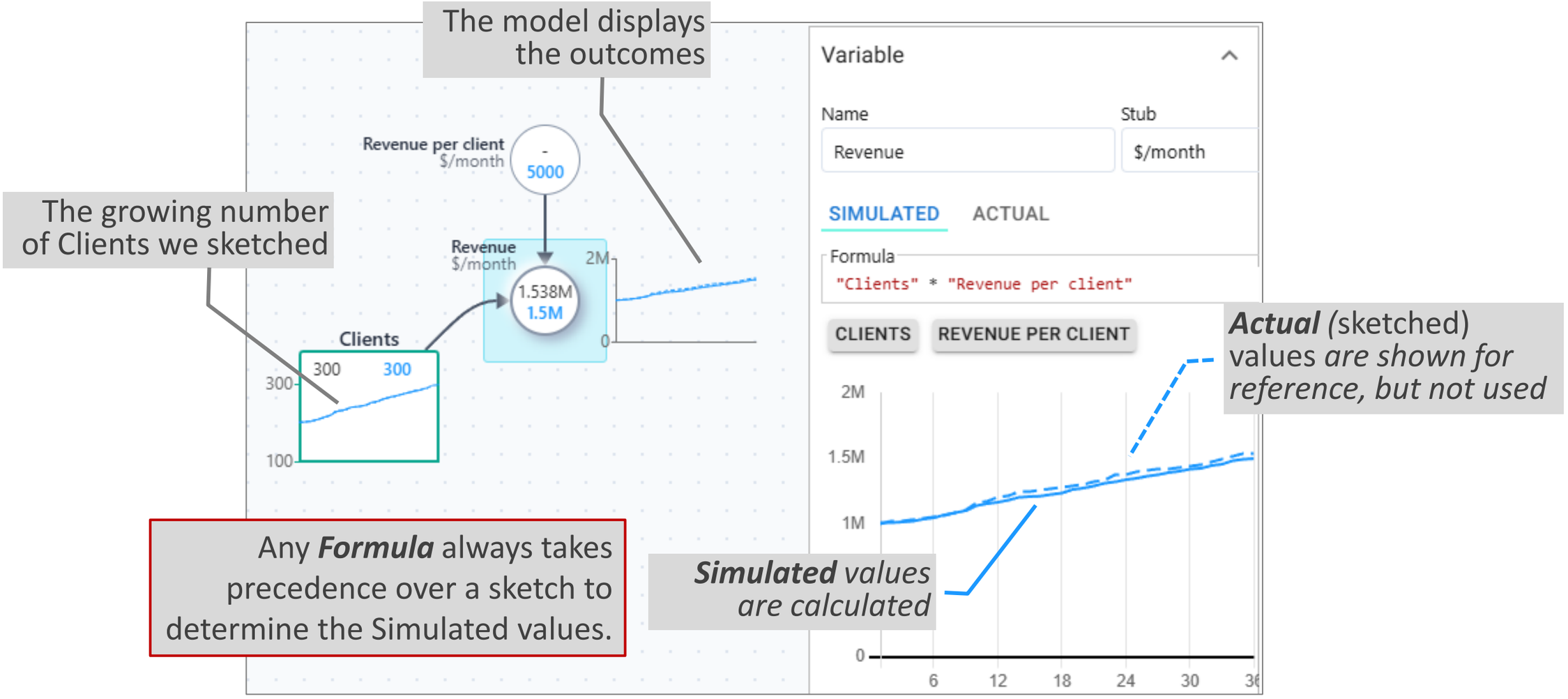




The Formula is completed



Calculate '*Revenue*' – you should see …

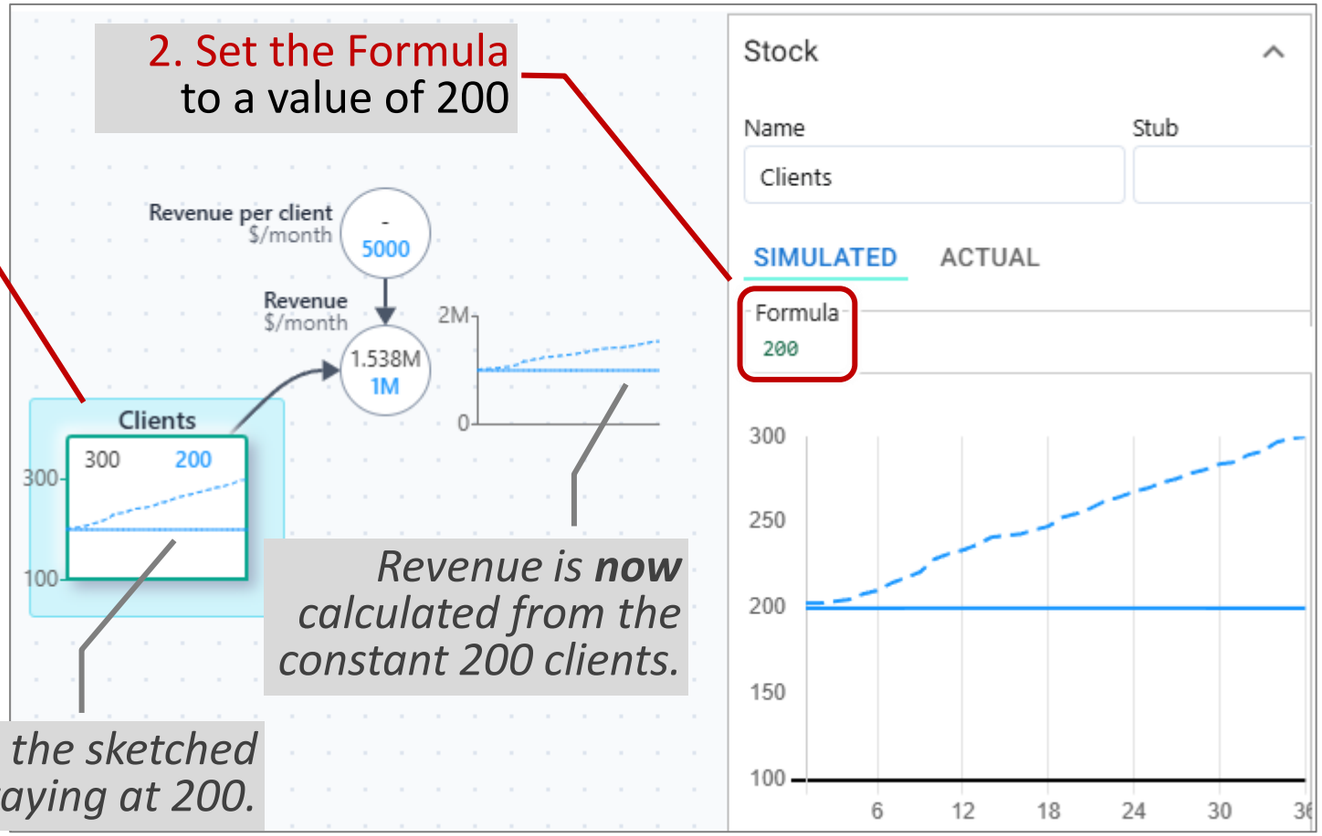


Why do we model? … to ***explain*** real-world outcomes, so get Simulated values to ***match*** Actual values

Set the ***initial*** number of clients

1. Select the stock of '*Clients*'

2. Set the Formula to a value of 200



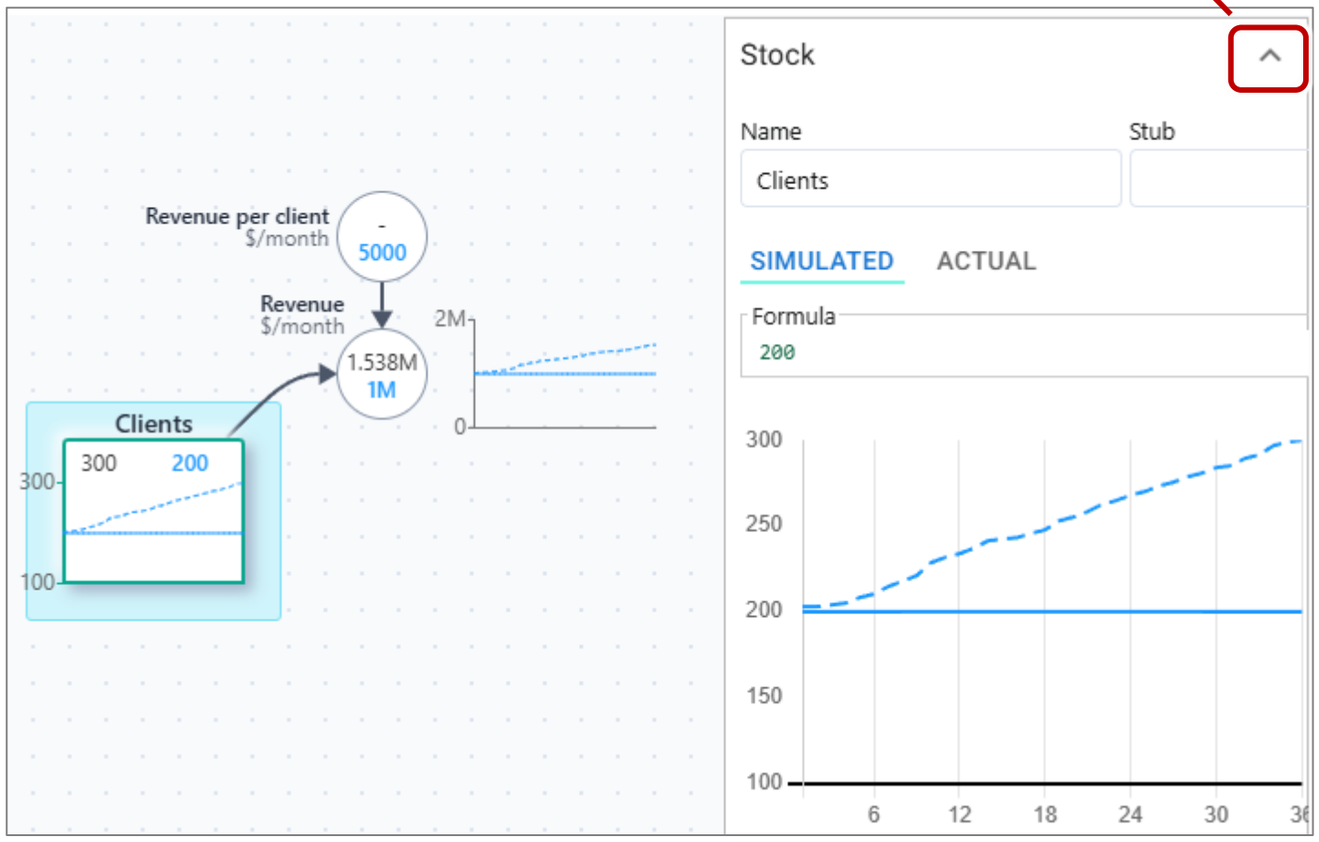
*Revenue is **now** calculated from the constant 200 clients.*

The Stock ignores the sketched growth of Clients, staying at 200.

Any ***Formula*** always takes precedence over a sketch to determine the Simulated values.

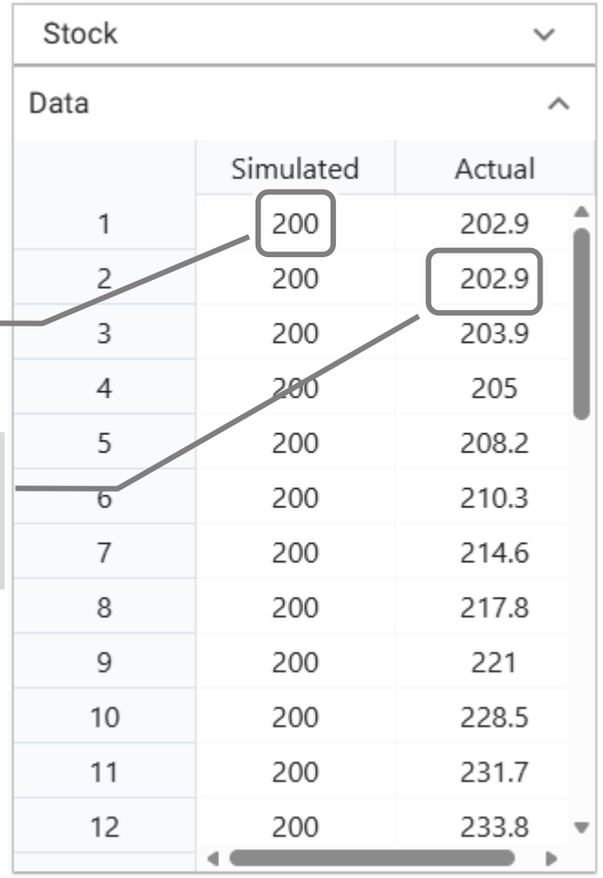
Check the values for the number of clients

1. Click ‘^’ to hide the Stock’s settings



1. Click to reveal the Stock’s data





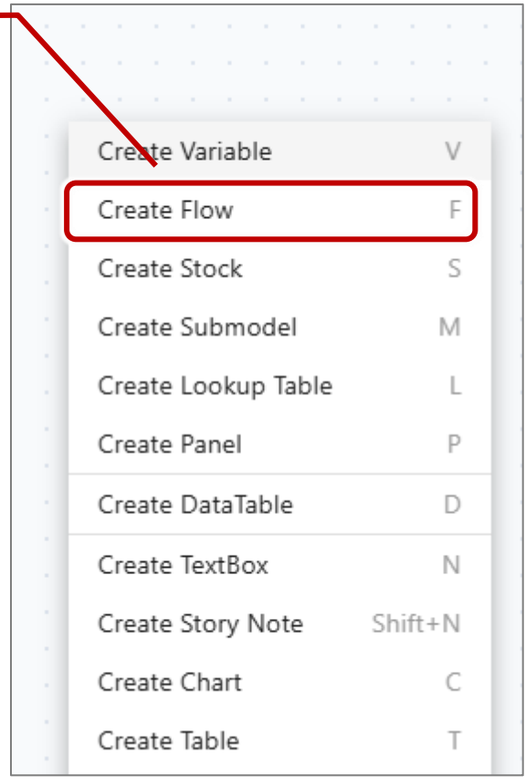
***Simulated** values are set by the Formula*

***Actual** values are still shown, for reference, but not used by the model*

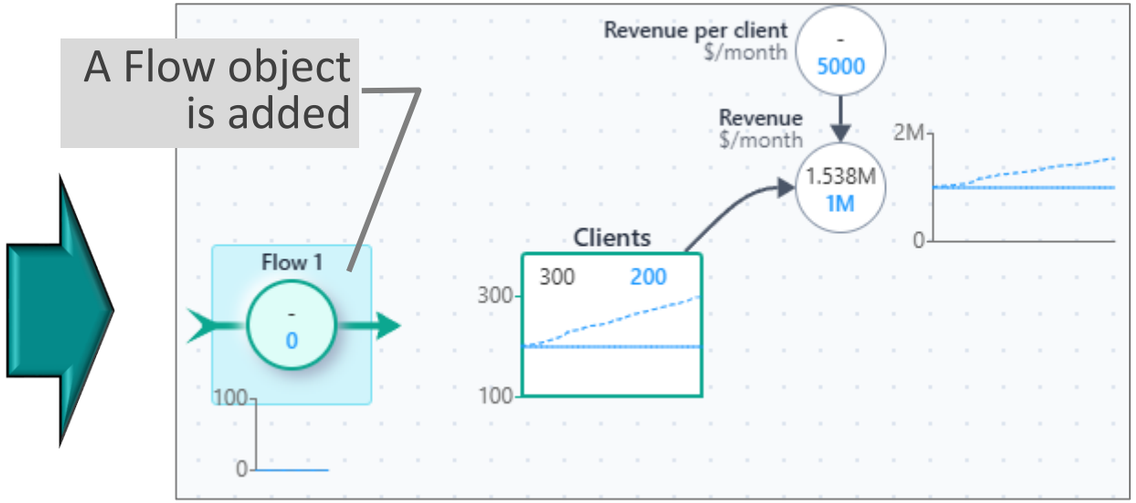
Add a ‘Flow’ for how fast Clients grow

1. Right-click .. choose ‘Create Flow’

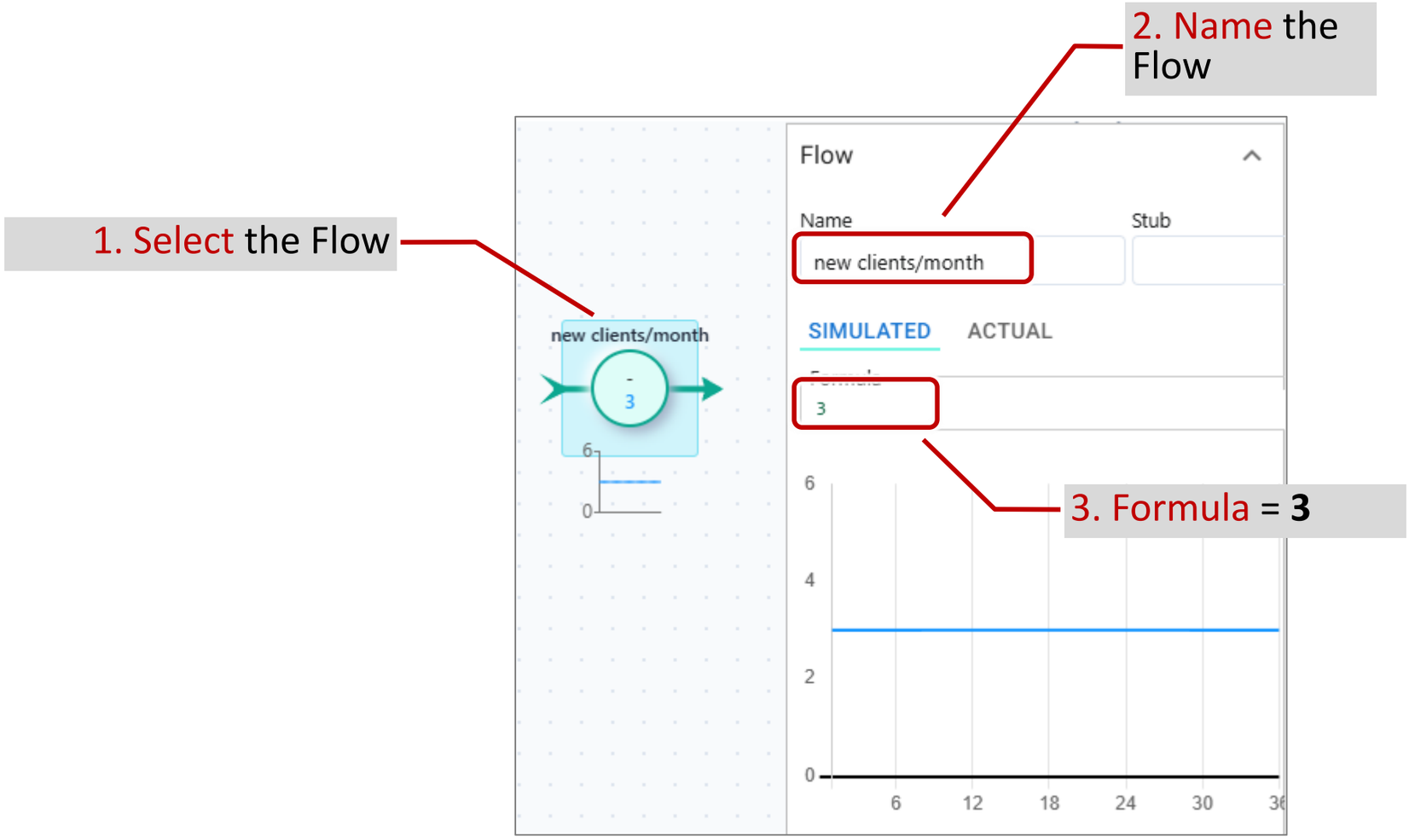
… OR just hit ‘**F**’ to add a Flow at this location



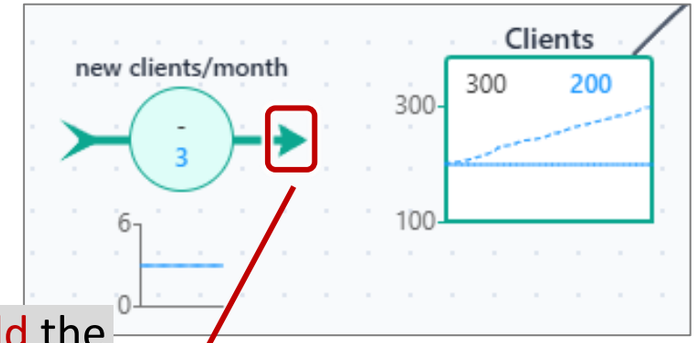
A Flow object is added



Add a ‘Flow’ for how fast Clients grow

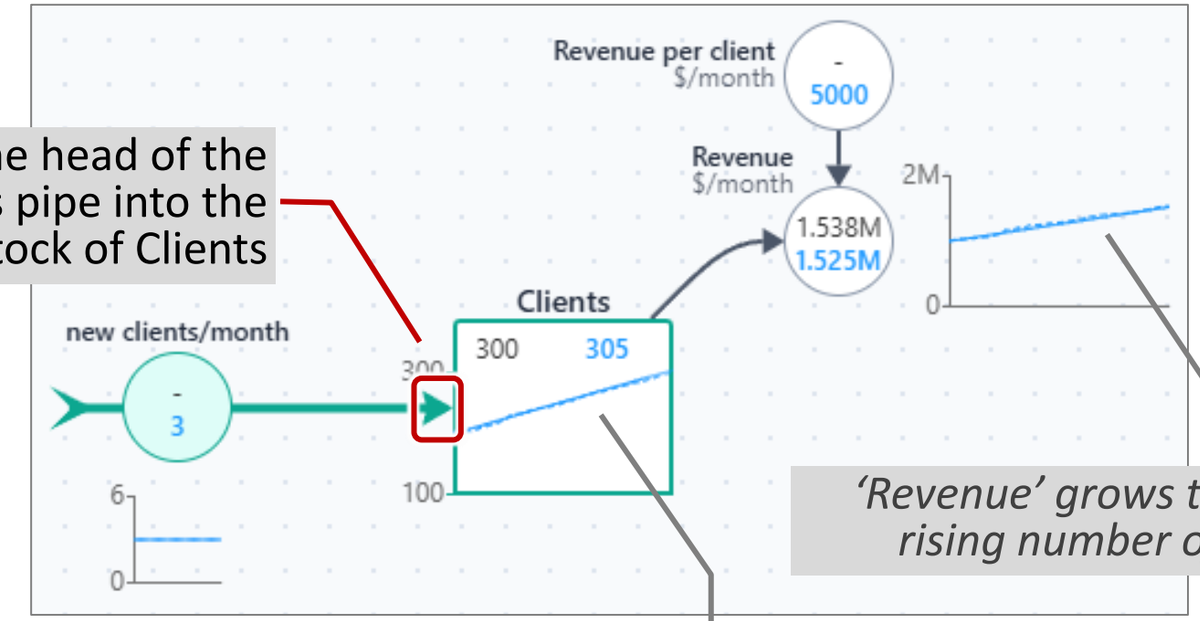


Make the number of clients grow



1. Click-hold the arrow-head of the Flow's 'pipe'

2. Drag the head of the Flow's pipe into the stock of Clients



'Revenue' grows to reflect rising number of Clients

The Stock of Clients instantly grows by 3/month to 305

Starting month 1 with 200 clients, adding 3/month gives 305 clients at the ***start*** of month 36 (*35 months later*). There would be 308 clients at the ***end*** of month 36.

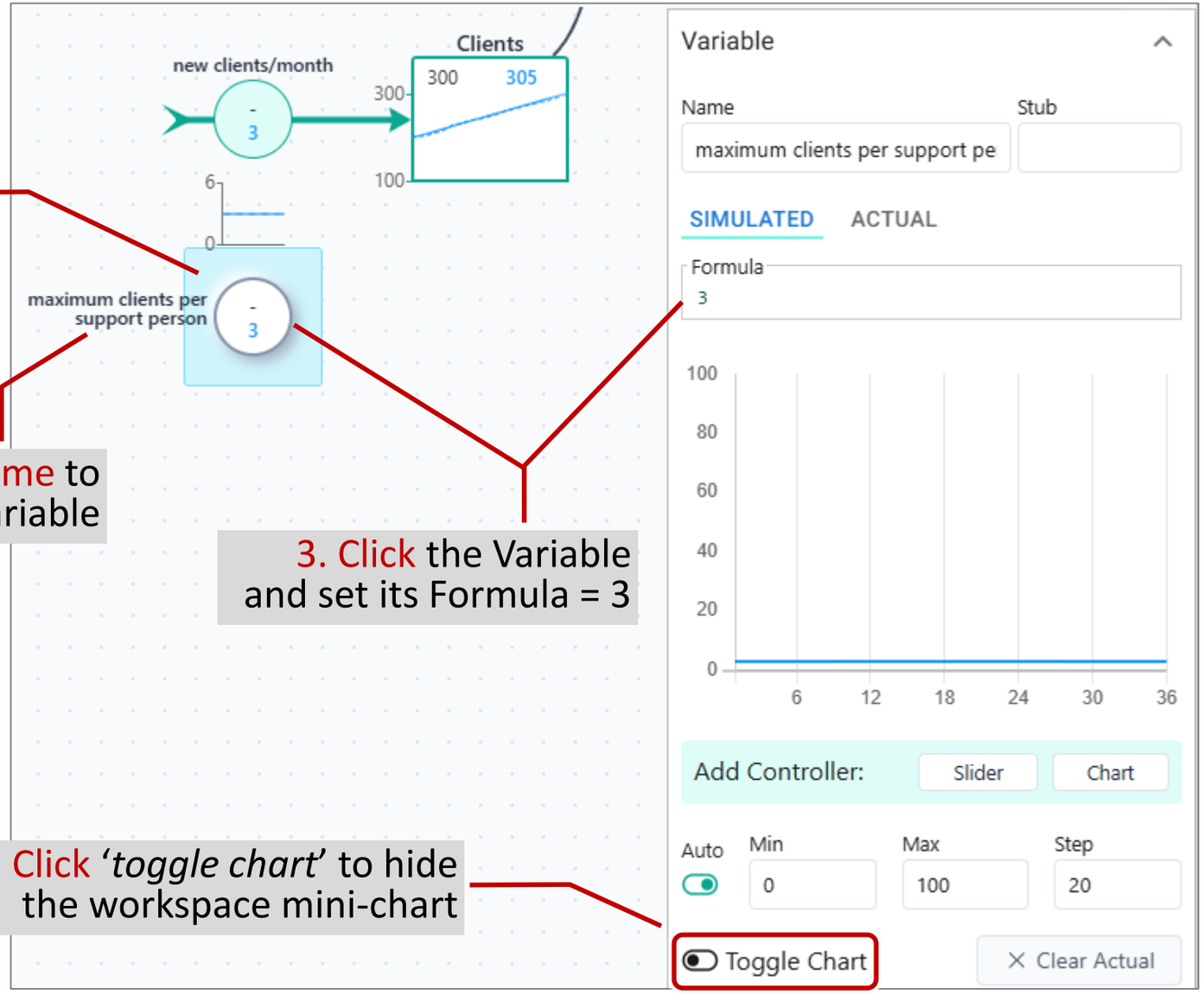
What minimum number of staff do we need?

1. Add a Variable *'maximum clients per support person'*

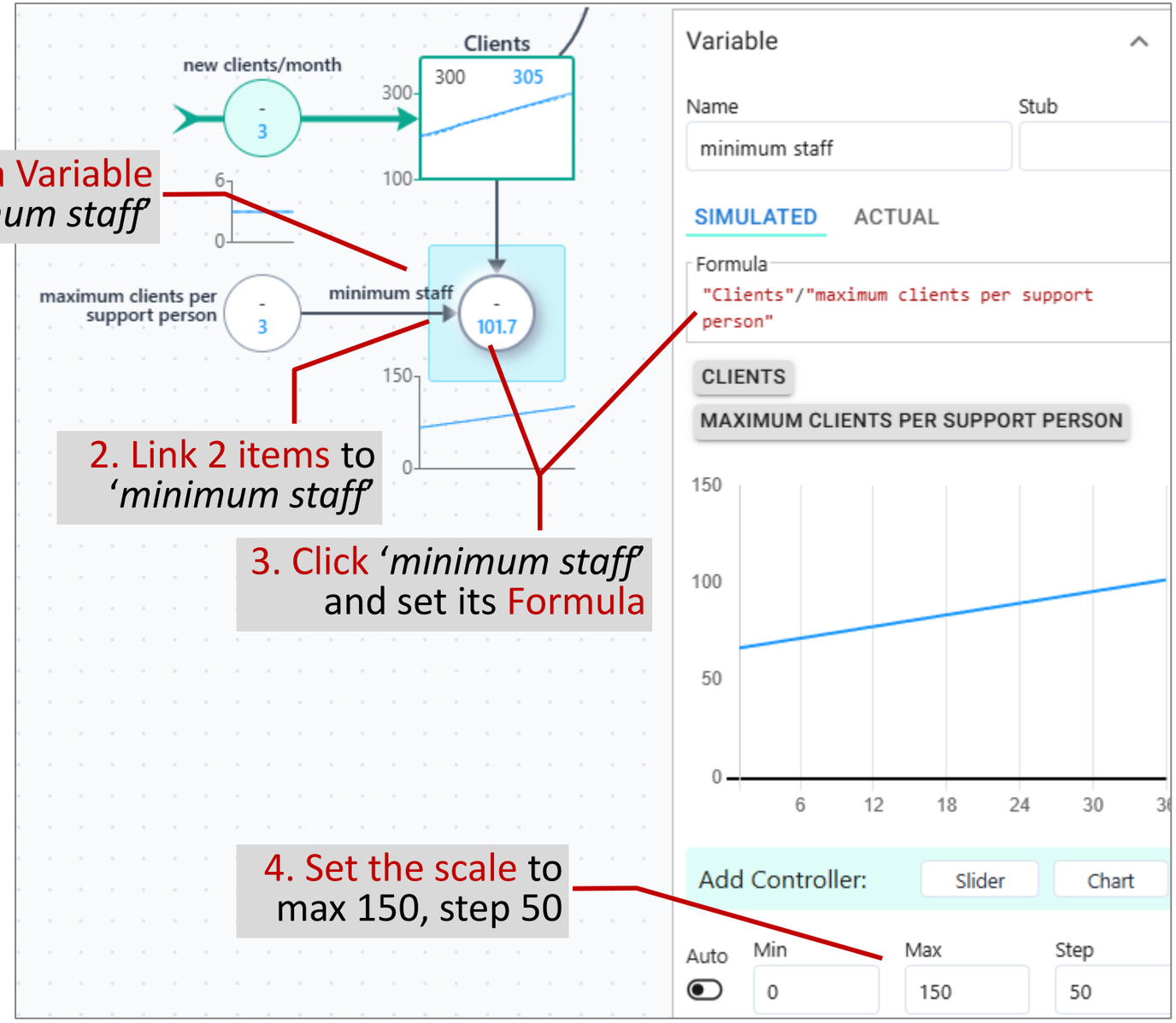
2. Drag the name to left of the Variable

3. Click the Variable and set its Formula = 3

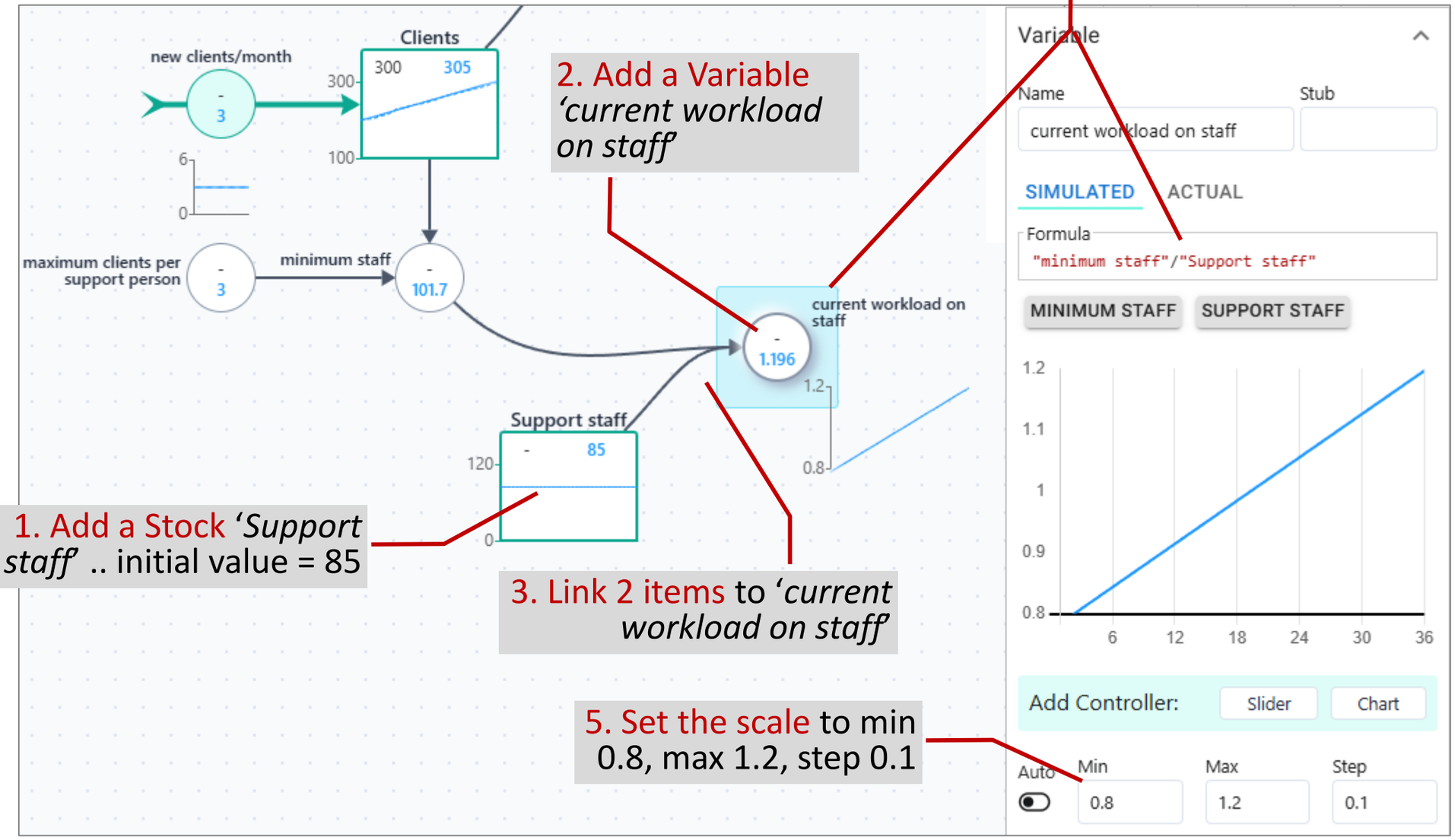
3. Click '*toggle chart*' to hide the workspace mini-chart



What minimum number of staff do we need?



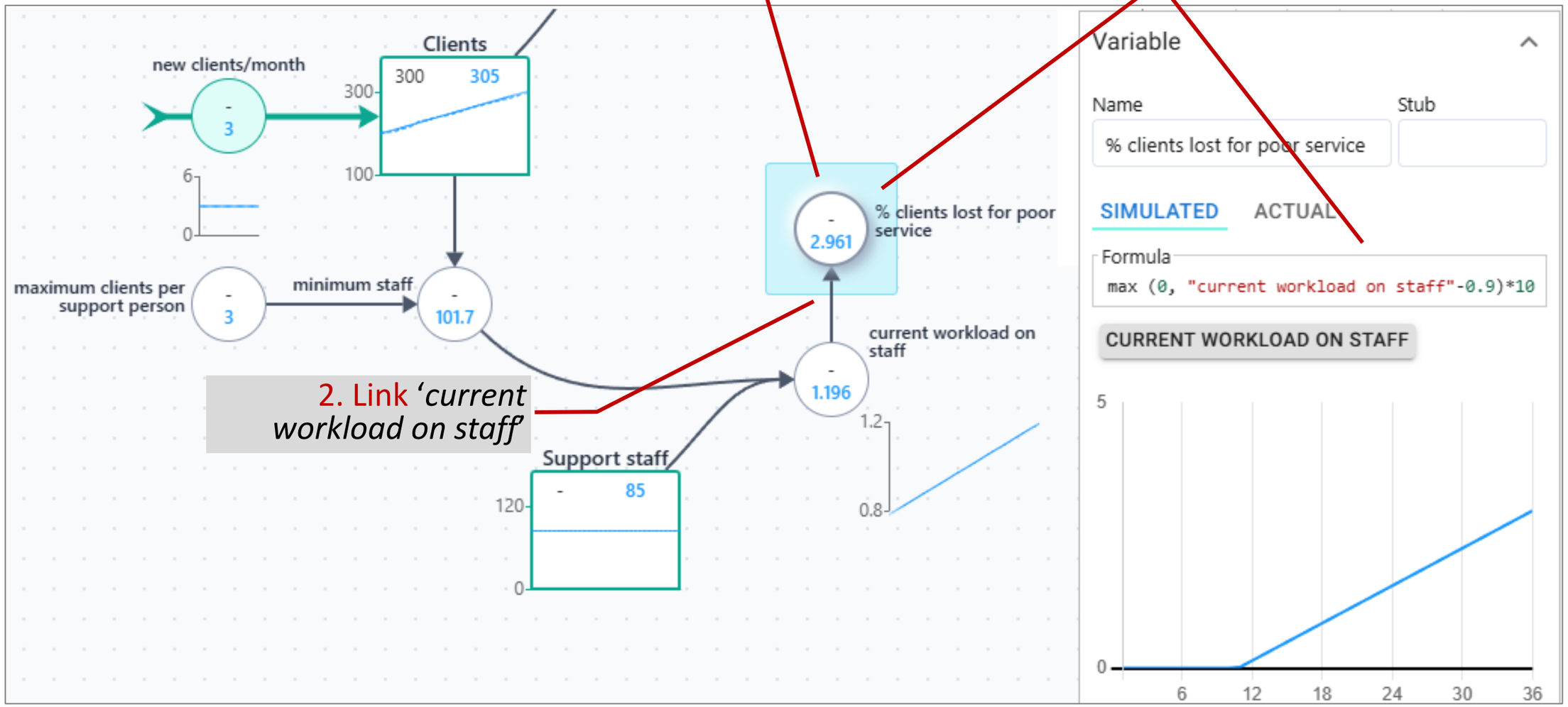
How does workload change with more clients?



How does workload affect client losses?

1. Add a Variable '*% clients lost for poor service*'

3. Click '*% clients lost for poor service*' and set its Formula



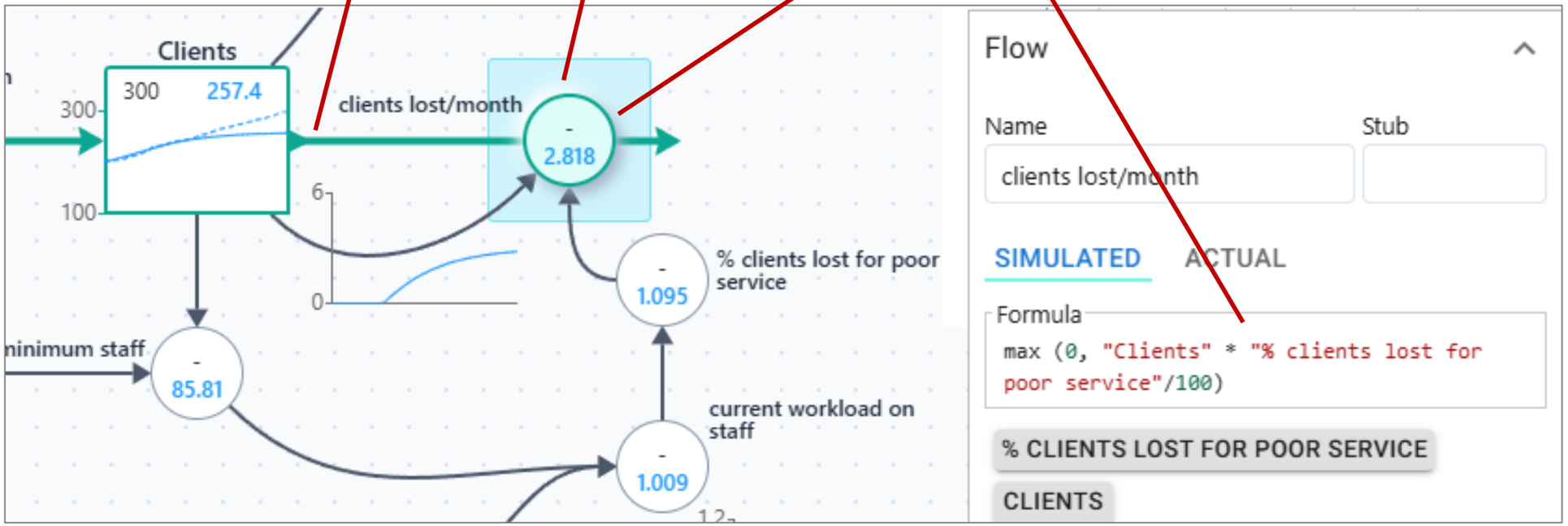
2. Link '*current workload on staff*'

How fast do we lose clients?

1. Add a flow '*clients lost/month*'

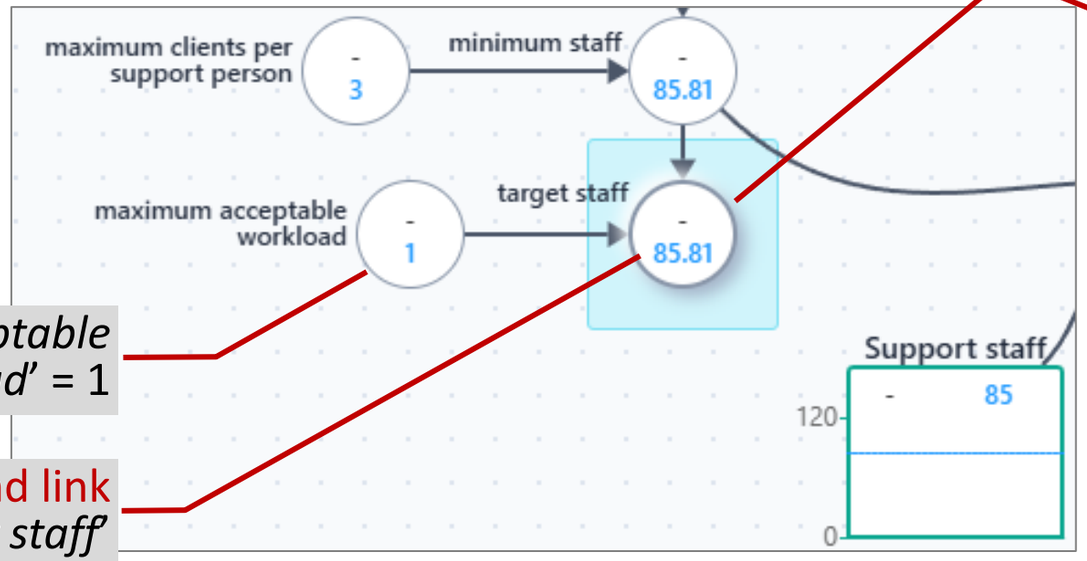
2. Drag the Flow's tail into the '*Clients*' Stock

3. Click '*clients lost/month*' and set its Formula



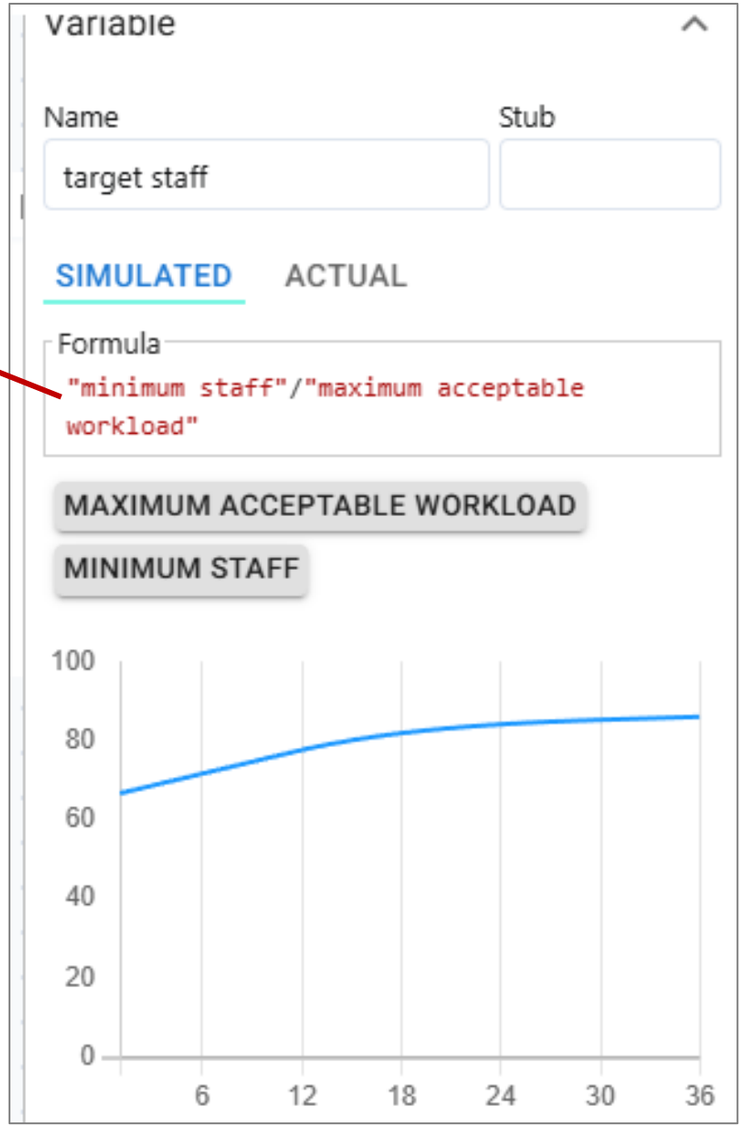
How many staff do we need?

3. Click '*target staff*' and set its Formula



1. Add '*max acceptable workload*' = 1

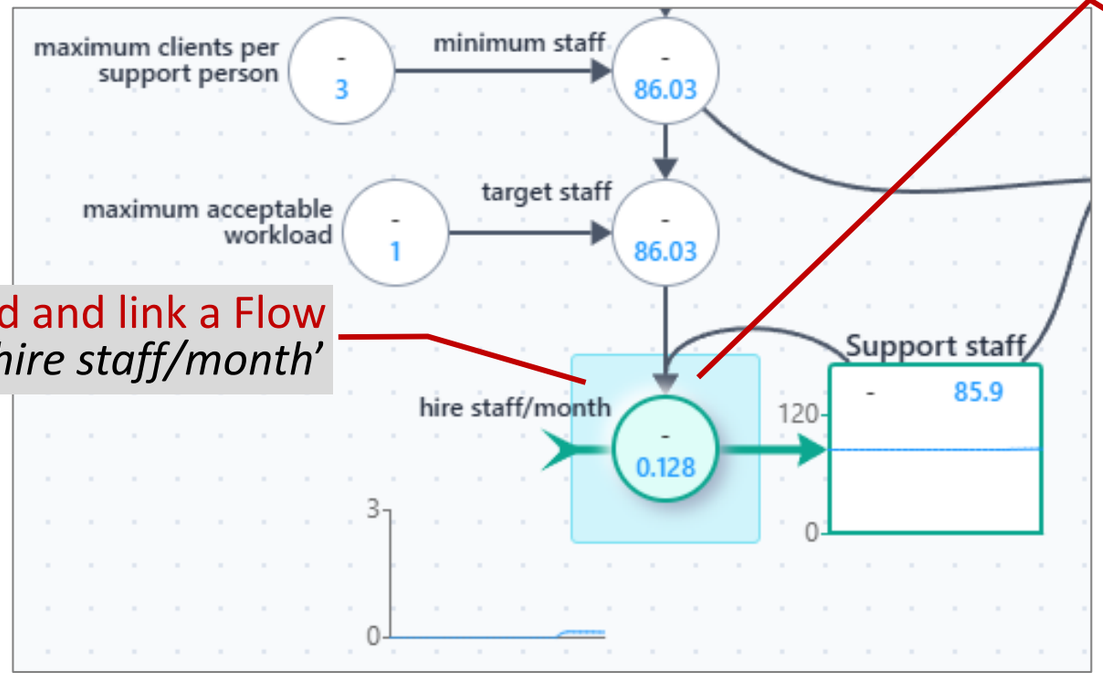
2. Add and link '*target staff*'

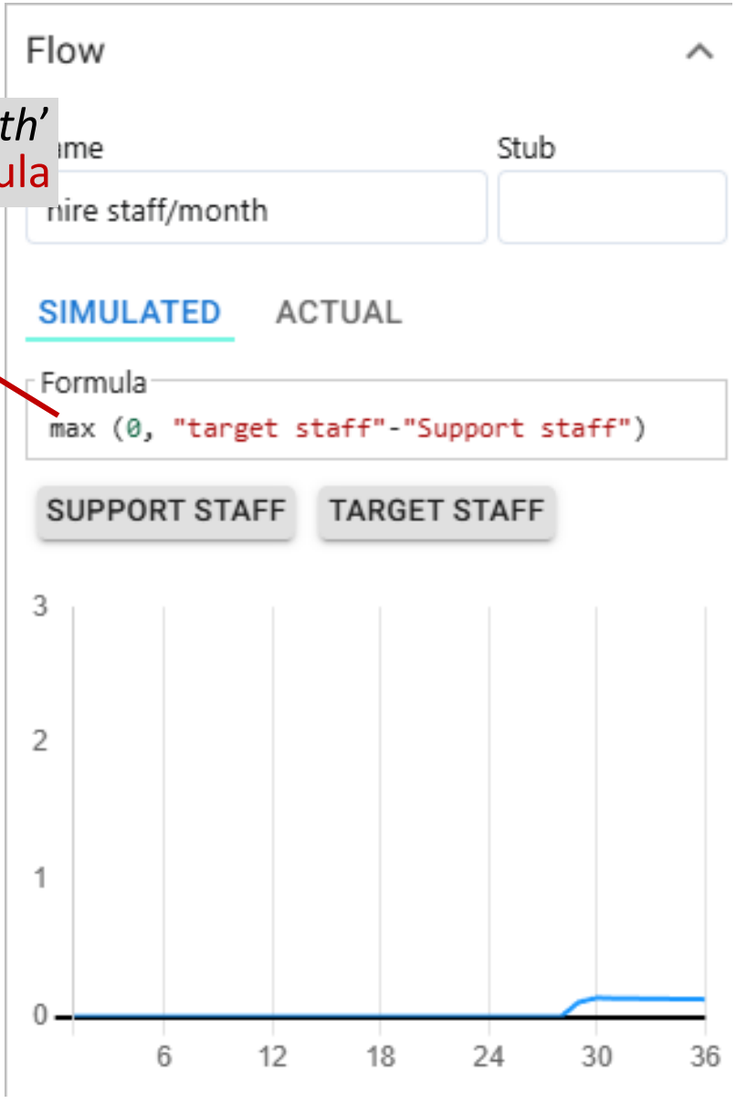


How many staff do we need?

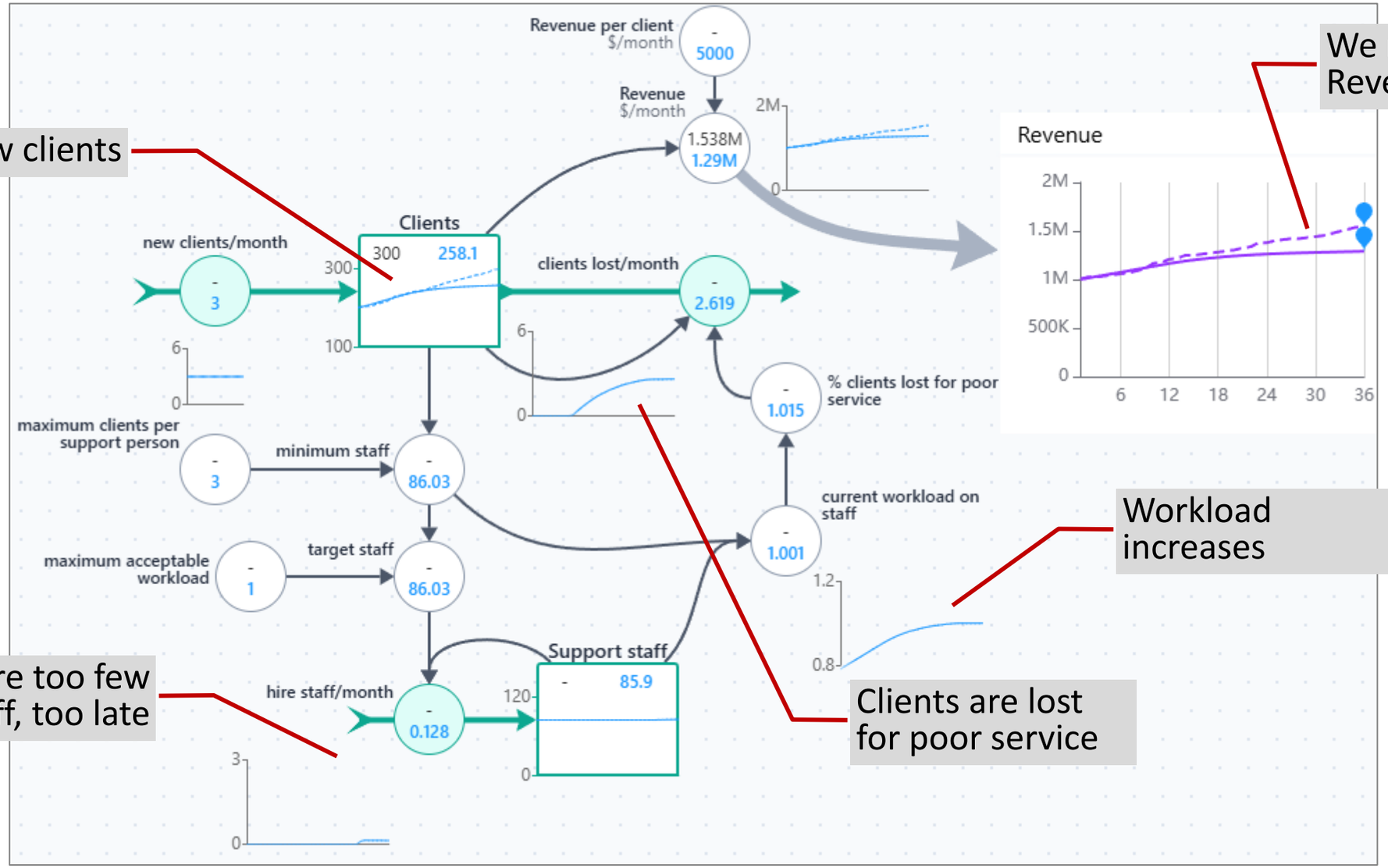
3. Click ‘*hire staff/month*’ and set its Formula

2. Add and link a Flow ‘*hire staff/month*’





The working model …



We grow clients

We miss our desired Revenue growth

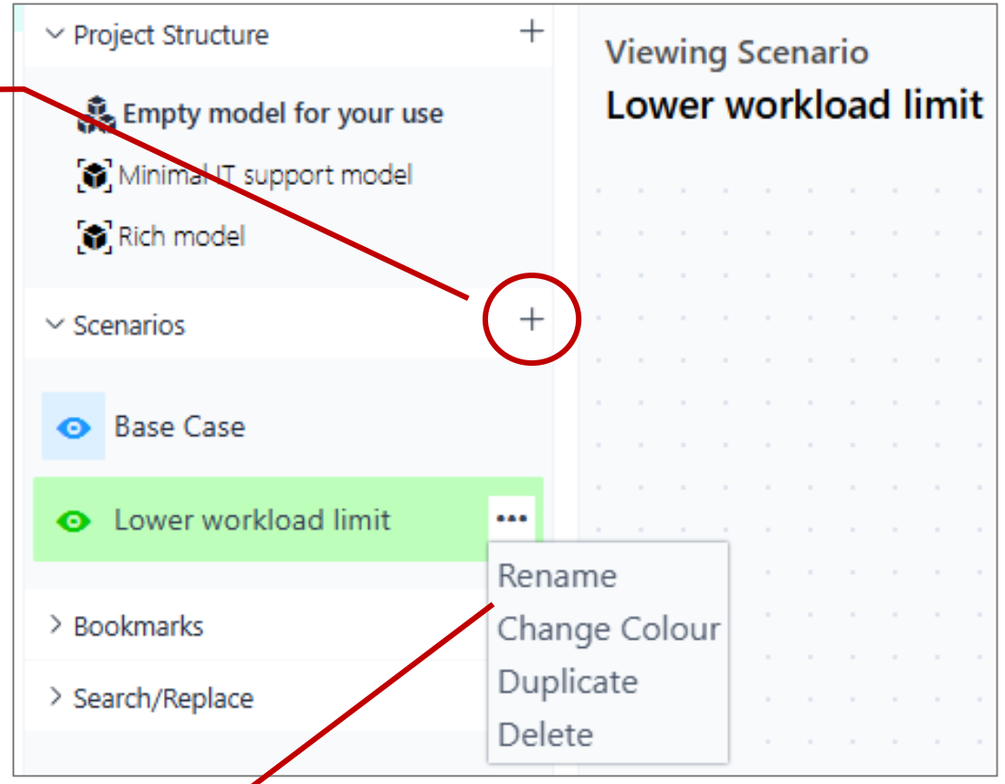
Workload increases

We hire too few staff, too late

Clients are lost for poor service

Create a scenario

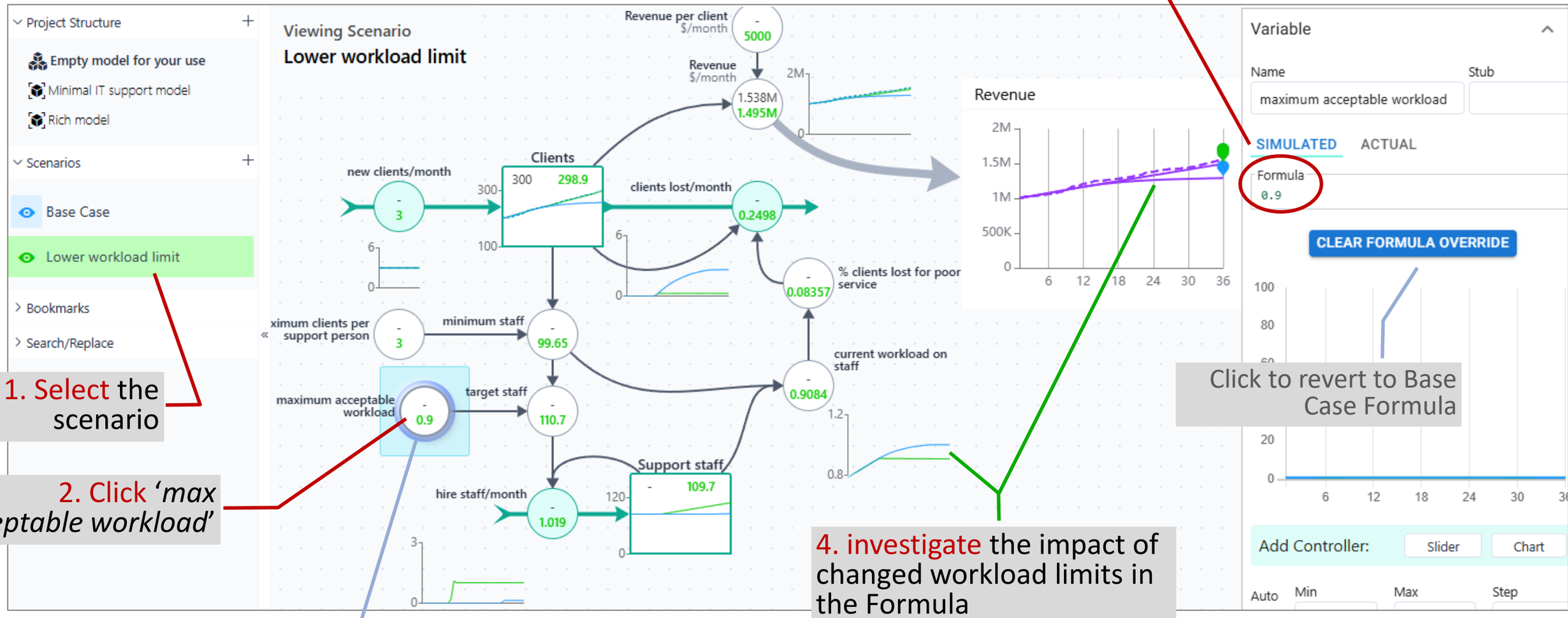
1. Click ‘+’ to add a scenario



2. Click ‘**…**’ to name the scenario and set its colour

Explore scenarios

3. Change the value for *'max acceptable workload'*



1. Select the scenario

2. Click *'max acceptable workload'*

Scenario-specific changes are highlighted

4. investigate the impact of changed workload limits in the Formula

Click to revert to Base Case Formula

“A ***model***”

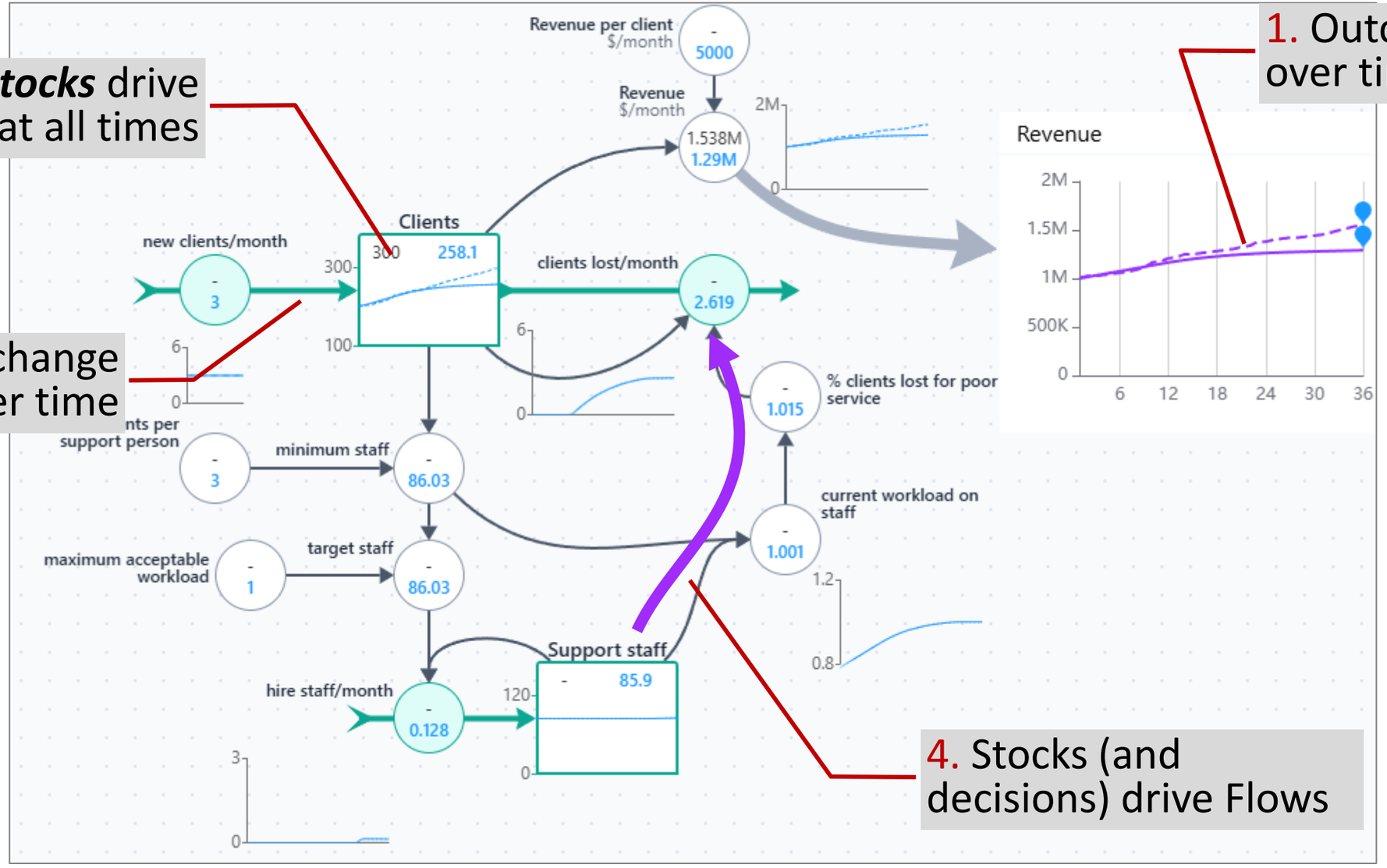
behaves as the real world behaves

… and for the same ***reasons***

The 4-step logic and process…

2. ***Stocks*** drive outcomes at all times

3. ***Flows*** change Stocks over time



1. Outcomes change over time

4. Stocks (and decisions) drive Flows

Benefits of the 'AgileSD' process we followed …

1. Time-chart the desired outcomes (*and history*)

   "***what – quantitatively - causes those outcomes?***"

2. Find, define and quantify the "stocks" of resources driving those outcomes (*customers drive sales; staff drive service support, etc …*)
3. Quantify the 'Flow rates' causing those resource-stocks to grow or decline

   "what causes those flow rates?"

4. Find, define, quantify the <u>other</u> resource-stocks causing those flow rates

… repeat until satisfied

models give useful insight ***from the start***

data + Actual-v-Simulated checks ***validate*** the model at all steps (*including use of well-informed estimates*)

when all model factors' values over time appear to be explained

The process ***discovers*** feedback, based on ***evidence***

For more on ***good*** policies for this IT support business …

1. *See the other models in the project*
2. *Watch how agentic-AI leads to the self-managing enterprise …* sdl.re/AIshowITS

