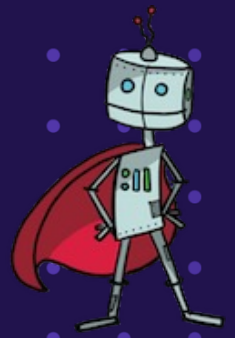
Red Hat Summit

AnsibleFest



How Automation Pays for Itself

Bob Longmore
Technical Solutions Architect
World Wide Technology

Red Hat

WHOAMI?

Bob Longmore
World Wide Technology
Technical Solutions Architect
Global Solutions and Architecture
Minneapolis, MN

Go Wolves!

Long history in technology dating back to the US Air Force in the 1990s. Background in networking, security, and data center. In 1998, I wrote a batch file to install antivirus, kicking off decades of experimenting with automation.

wwt.com/profile/bob-longmore

linkedin.com/in/boblongmore

@boblongmore

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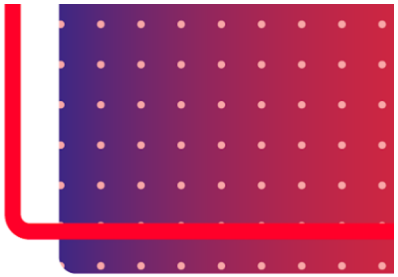
Measuring Matters



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Platform Pete

- Long history in network engineering
- Has spent a lot of time learning and relearning development skills
- Loves to Automate
- Dreams in YAML
- Never wants to go back to CLI

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Bossman Baldric

- Trusts IT, but answers to a board
- Needs to justify IT budget vs. value to the business
- Likes Numbers
- Once, in a meeting, said YASL when he meant YAML
- Responds to shiny objects

Why does measuring automation matter?

Provide justification for investment in automation training, time, and tools

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Prove that these investments have a positive impact on business outcomes

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Prove that these investments have a positive impact on business outcomes

The ability to refine processes and identify hot spots for future development

Eliminate the ‘automation for automation’s sake’ stigma

Why does measuring matter?

How can I help prove that automation not only makes my life better, but makes this a better company for our customers?

"Measurement: A quantitatively expressed reduction of uncertainty based on one or more observations."

Measurement is reducing unknowns

Knowing anything is better than knowing nothing.

"How to Measure Anything" by Douglas Hubbard

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Warning: Math Ahead

Math

EHS = Engineer Hours Saved:

MT = Manual Time
AT = Automated Time
EHS = Hours Saved

$$EHS = MT - AT$$

10 Switch Upgrades

It takes 60 minutes to upgrade a switch manually

It takes 7 minutes to upgrade a switch via automation.

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Math

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$$EHS = MT - AT$$

10 Switch Upgrades

It takes 60 minutes to upgrade a switch manually

It takes 7 minutes to upgrade a switch via automation.

$$EHS = (10 * 60) - (10 * 7)$$

$$EHS = 530 / 60$$

$$EHS = 8.8$$

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Math

EHS = Engineer Hours Saved:

MT = Manual Time
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$$EHS = MT - AT$$

EMS = Engineer Money Saved

EC = Estimated hourly cost of an engineers time multiplied by the amount of engineers
MC = Manual Cost
AC = Automated Cost

$$MC = EC * MT$$
$$AC = EC * AT$$

$$EMS = MC - AC$$

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10 Switch Upgrades

Estimated Hourly Engineer Rate: $100

MT = 60 minutes

AT = 7 minutes

$$MC = (10 * 60 / 60) * \$100 = \$1{,}000$$

$$AC = (10 * 7 / 60) * \$100 = \$117$$

$$EMS = \$1000 * \$117 = \$883$$

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ROI = Return on Investment

TC = Total Cost
B = Benefits
NB = Net Benefits

$$NB = B - TC$$

$$ROI = (NB / TC) * 100$$

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B = Benefits
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$$NB = B - TC$$

$$ROI = (NB / TC) * 100$$

$$NB = 11000 - 10000 = 1000$$

$$ROI = 1000/5000 * 100 = 20\%$$

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Math

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ROI = Return on Investment

TC = Total Cost

Total cost includes:
- Initial Investment
- Subscriptions
- Ongoing Maintenance

B = Benefits

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Math

EHS = Engineer Hours Saved:

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ROI = Return on Investment

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B = Benefits

Benefits Include:

- Engineer Money Saved
- Cost of Mistakes Avoidance
- Faster Repair Times
- Improved Quality
- Revenue Increases

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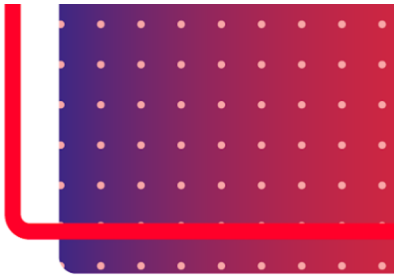

How do we visualize our Measurements?

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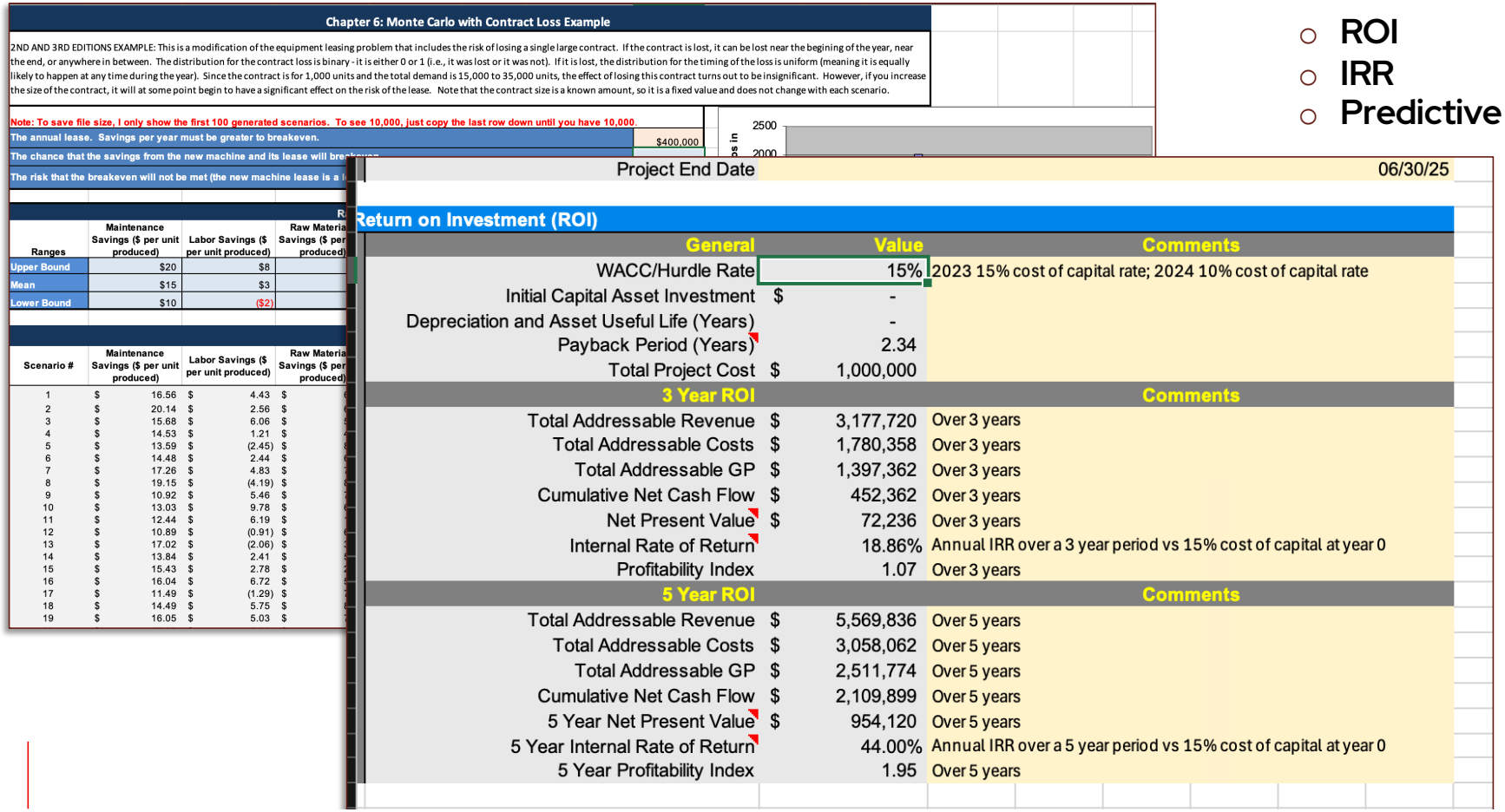
How to Visualize?

Spreadsheets, the most popular data science tool



Chapter 6: Monte Carlo with Contract Loss Example

2ND AND 3RD EDITIONS EXAMPLE: This is a modification of the equipment leasing problem that includes the risk of losing a single large contract. If the contract is lost, it can be lost near the begining of the year, near the end, or anywhere in between. The distribution for the contract loss is binary - it is either 0 or 1 (i.e., it was lost or it was not). If it is lost, the distribution for the timing of the loss is uniform (meaning it is equally likely to happen at any time during the year). Since the contract is for 1,000 units and the total demand is 15,000 to 35,000 units, the effect of losing this contract turns out to be insignificant. However, if you increase the size of the contract, it will at some point begin to have a significant effect on the risk of the lease. Note that the contract size is a known amount, so it is a fixed value and does not change with each scenario.

Note: To save file size, I only show the first 100 generated scenarios. To see 10,000, just copy the last row down until you have 10,000.

The annual lease. Savings per year must be greater to breakeven.	$400,000
The chance that the savings from the new machine and its lease will bre	
The risk that the breakeven will not be met (the new machine lease is a l	

Ranges	Maintenance Savings ($ per unit produced)	Labor Savings ($ per unit produced)	Raw Materia Savings ($ per produced)
Upper Bound	$20	$8	
Mean	$15	$3	
Lower Bound	$10	($2)	

Scenario #	Maintenance Savings ($ per unit produced)	Labor Savings ($ per unit produced)	Raw Materia Savings ($ per produced)
1	$ 16.56	$ 4.43	$
2	$ 20.14	$ 2.56	$
3	$ 15.68	$ 6.06	$
4	$ 14.53	$ 1.21	$
5	$ 13.59	$ (2.45)	$
6	$ 14.48	$ 2.44	$
7	$ 17.26	$ 4.83	$
8	$ 19.15	$ (4.19)	$
9	$ 10.92	$ 5.46	$
10	$ 13.03	$ 9.78	$
11	$ 12.44	$ 6.19	$
12	$ 10.89	$ (0.91)	$
13	$ 17.02	$ (2.06)	$
14	$ 13.84	$ 2.41	$
15	$ 15.43	$ 2.78	$
16	$ 16.04	$ 6.72	$
17	$ 11.49	$ (1.29)	$
18	$ 14.49	$ 5.75	$
19	$ 16.05	$ 5.03	$

Project End Date		06/30/25

Return on Investment (ROI)

General		Value	Comments
WACC/Hurdle Rate		15%	2023 15% cost of capital rate; 2024 10% cost of capital rate
Initial Capital Asset Investment	$	-	
Depreciation and Asset Useful Life (Years)		-	
Payback Period (Years)		2.34	
Total Project Cost	$	1,000,000	
3 Year ROI			**Comments**
Total Addressable Revenue	$	3,177,720	Over 3 years
Total Addressable Costs	$	1,780,358	Over 3 years
Total Addressable GP	$	1,397,362	Over 3 years
Cumulative Net Cash Flow	$	452,362	Over 3 years
Net Present Value	$	72,236	Over 3 years
Internal Rate of Return		18.86%	Annual IRR over a 3 year period vs 15% cost of capital at year 0
Profitability Index		1.07	Over 3 years
5 Year ROI			**Comments**
Total Addressable Revenue	$	5,569,836	Over 5 years
Total Addressable Costs	$	3,058,062	Over 5 years
Total Addressable GP	$	2,511,774	Over 5 years
Cumulative Net Cash Flow	$	2,109,899	Over 5 years
5 Year Net Present Value	$	954,120	Over 5 years
5 Year Internal Rate of Return		44.00%	Annual IRR over a 5 year period vs 15% cost of capital at year 0
5 Year Profitability Index		1.95	Over 5 years

- ROI
- IRR
- Predictive Modeling

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Jupyter Automation Calculator

Graphing savings over three years

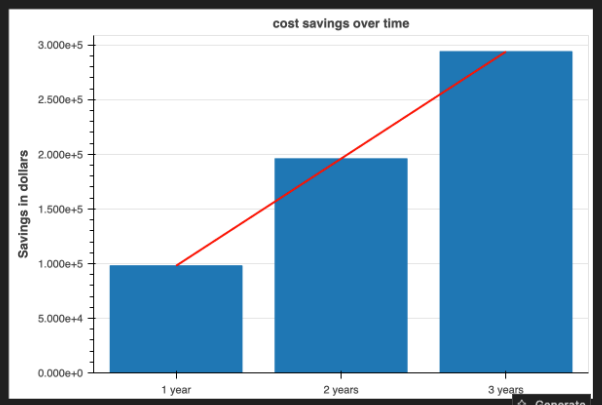
```
from bokeh.plotting import figure, show
from bokeh.models import Title, LabelSet
from bokeh.io import output_notebook

output_notebook()

time = ["1 year", "2 years", "3 years"]
savings = [task_savings_year, two_year_savings, three_year_savings]

p = figure(x_range=time, title="cost savings over time", height=400, toolbar_location=None, tools="")
p.title.align = "center"
p.add_layout(Title(text="Savings in dollars", align="center"), "left")
p.vbar(x=time, top=savings, width=.8)
p.line(x=time, y=savings, color="red", line_width=2)
p.xgrid.grid_line_color = None
p.y_range.start = 0
show(p)
```

BokehJS 3.6.0 successfully loaded.



Generate + Code + Markdown

Jupyter:

- Interactive Calculations
- Use graphing tools for visualization
- Native python

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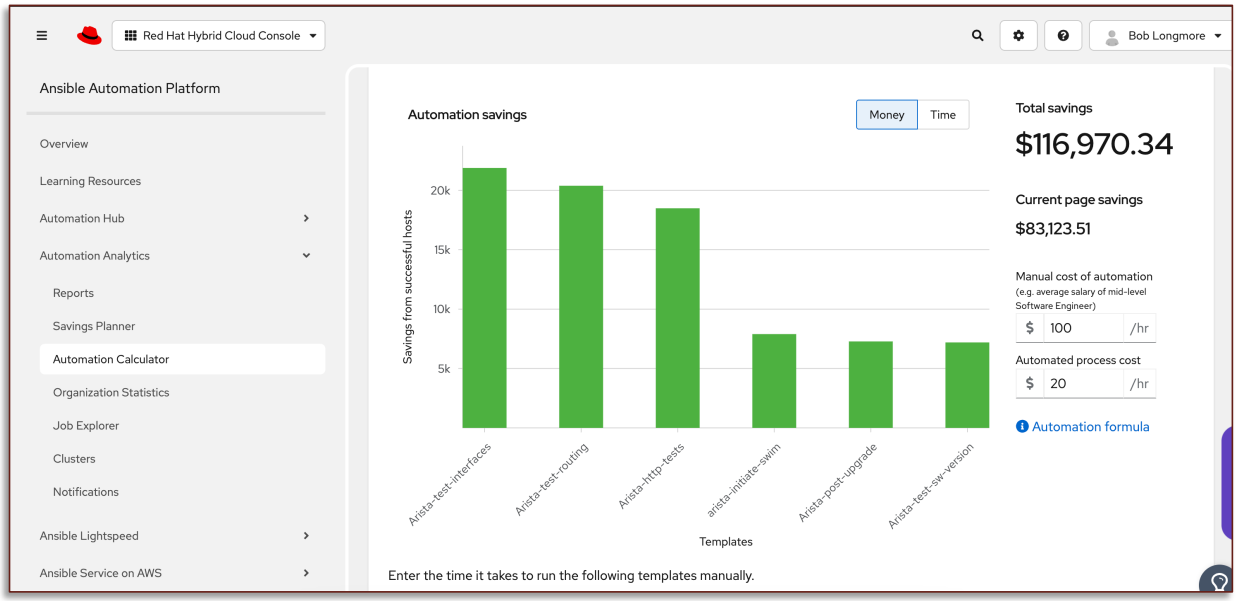
How to Visualize?

AAP Automation Analytics



- Red Hat Console
- AAP 2.5

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How to Visualize?

Custom Dashboards with Grafana

Grafana

- Multiple Data Sources
- Health of your systems
- Metrics and business outcomes

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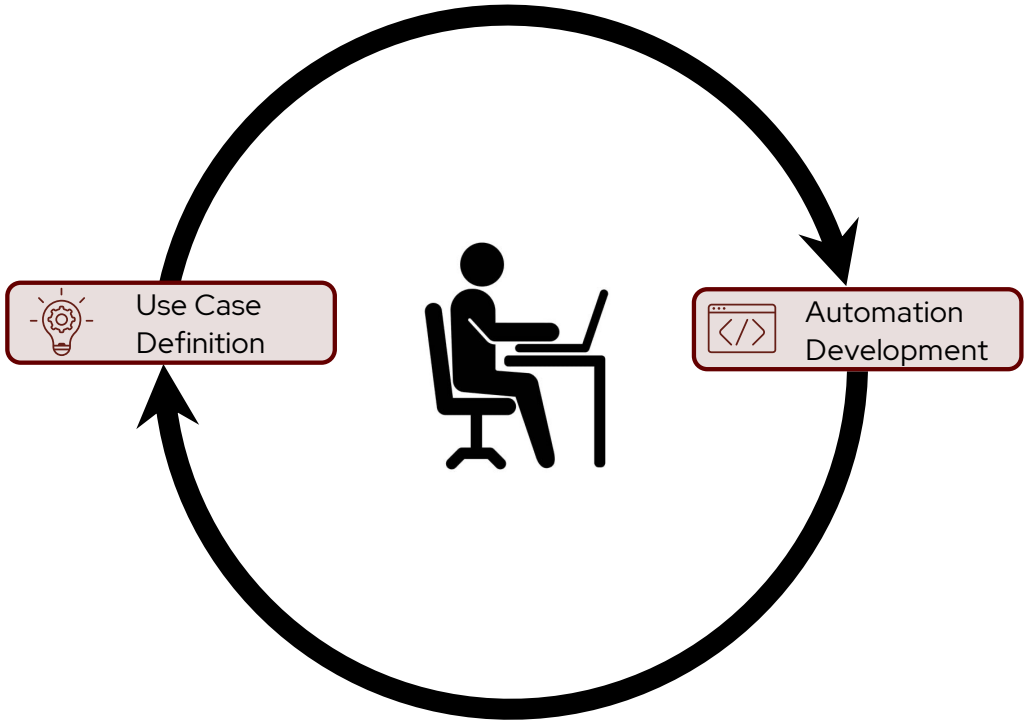
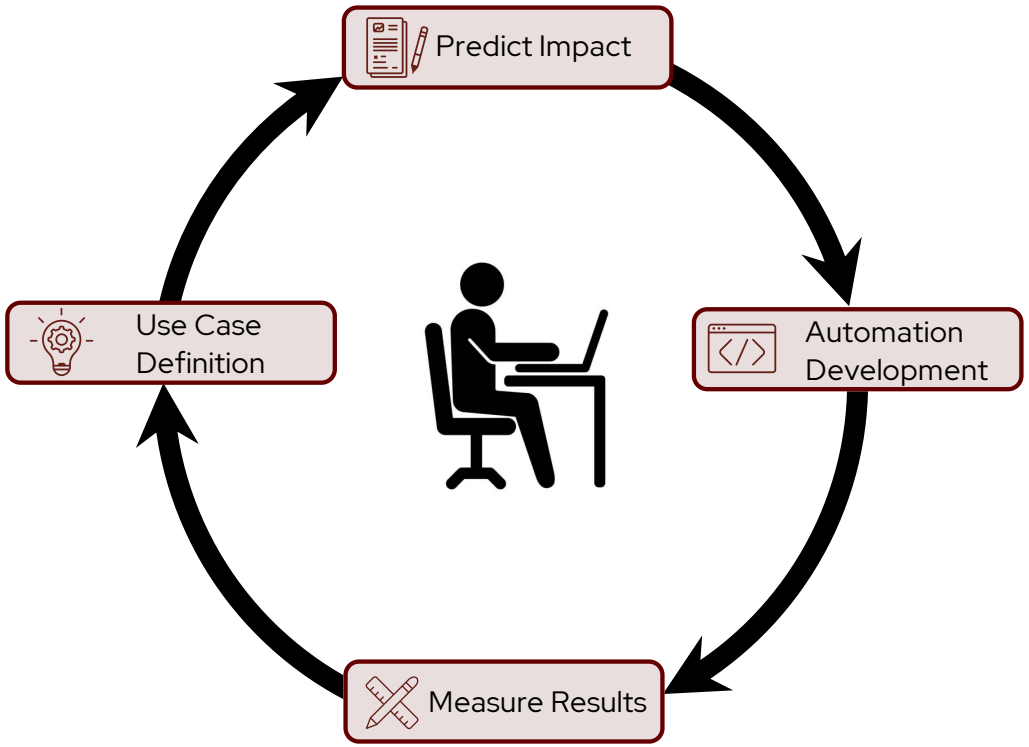
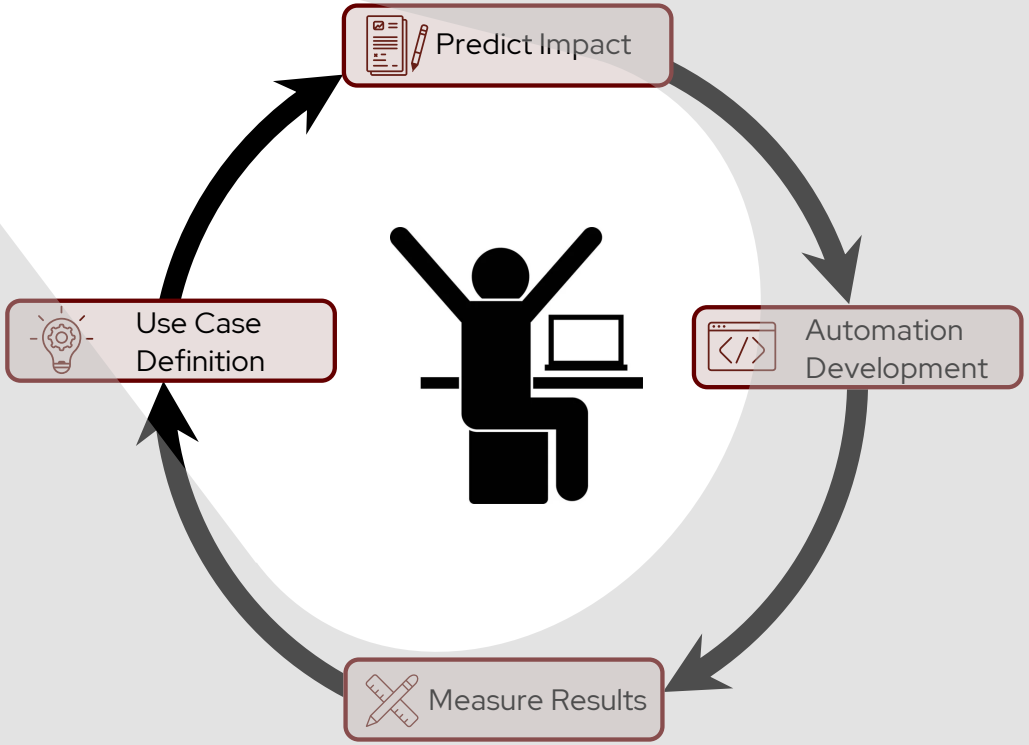
Changing Our Development Lifecycle



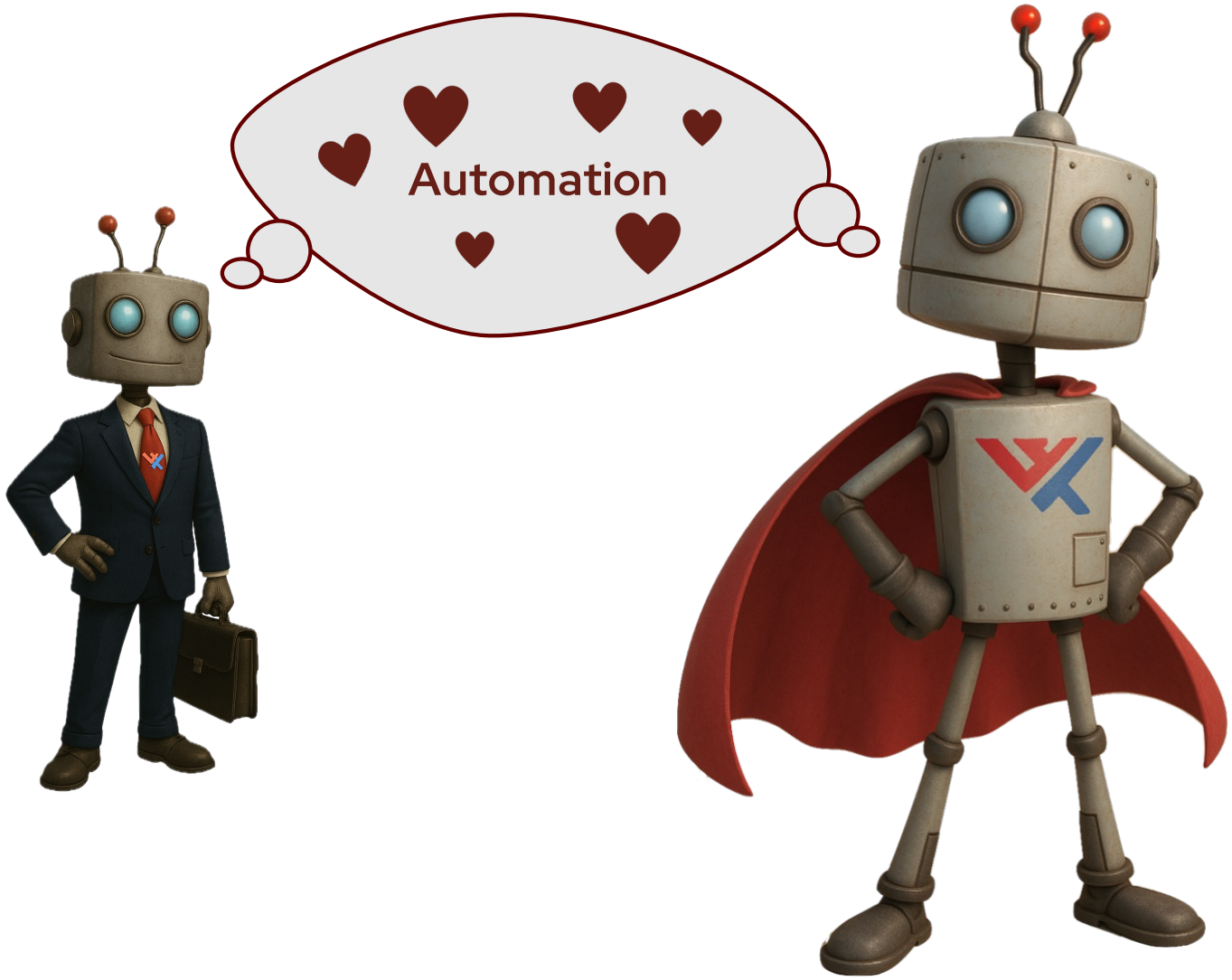
Changing Our Development Lifecycle



Changing Our Development Lifecycle



. . . Happily Ever After



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