

**PagerDuty**

# Calculating the ROI for Process Automation

# Table of contents

Introduction.....	3
Determining your baseline .....	4
Accounting for costs of interruptions and waiting .....	7
Measuring value of automation .....	8
Calculating value per automation run .....	8
Showing how automation improves more complex workflows .....	10
Calculating value when automation becomes impossibly good .....	12
Computing value of improved operations.....	13
Reporting on business value and ROI .....	15
Other ways to show the value of an automation program.....	16
Commissioning a PagerDuty Business Value Assessment .....	17
Conclusion .....	18

# Introduction

It takes more than excellent ideas to secure funding for an IT automation project. To justify starting or expanding a project in today's economy, you must demonstrate both current and future value, and how the project will support key business initiatives in service of your company's goals. Fortunately, automation projects with PagerDuty Process Automation deliver a significant Return on Investment (ROI). This e-book provides expert tips and ideas for showcasing the business value of PagerDuty Process Automation projects.

Often some creativity is needed to demonstrate the ROI of an IT automation project. The value of automating a business function varies based on what is being automated. Some examples of per run value of automation include:

- [A Fortune 500 financial services firm that saves 1 hour of personnel time per incident when a triggered remediation can resolve a problem.](#)
- [William Hill reduces time to patch by 95%](#)

Sometimes, what needs to be measured isn't just actual runs of automation, but the impact or effect of many more runs than is possible with human-driven workflows. Here is an example of [an Australian Bank that increased deployments to 500 to 600 per month thanks to Process Automation.](#)

In this paper, we'll cover what baseline measures you should gather for your as-is business, from KPIs for business processes to benefits of the workflows you are looking to automate. Then we'll discuss how to determine useful metrics showing the impact of automation. Finally, we'll suggest how to package these up so that you can show your ROI and business value of automation projects.

# Determining your baseline

In their purest form, Process Automation projects that resolve incidents and service requests can reduce labor costs and waiting time by as much as 95% to 99% for fully automated tasks as compared to previously human processed tasks. The trick to showing actual value delivered is understanding how to report this savings in the context of more complex business workflows.

First, you'll want to create a baseline of your as-is state. Most organizations define Key Performance Indicators (KPIs) for business processes and departmental functions. Ideally, you should track the value generated by your automation project in relation to these KPIs. As a next step, collect more detailed statistics about the specific workflows you intend to automate. For the purpose of this discussion, let's define a workflow as a sequence of human and computer-based activities. Here are some examples of metrics you'll want to compile from your ITSM systems and other sources.

For an IT operations team, key KPIs you will want to relate business value to include meeting customer and internal SLOs, as well as responsiveness and costs. Detailed statistics you may wish to capture for operations center request workflows include:

## Metrics for IT Service Request Workflows

Metric	Definition	Units
MTTC (Mean Time to Completion)	Mean Time to Close or Complete a request. This is average time spent waiting by requestors, inclusive of any idle time when no work is being done.	Lapsed time. If there's a known cost for waiting time, use cost units instead.
Processing time	Elapsed time it takes to do the work for completing a request, not including idle time when no work is being performed.	Lapsed time
Cycle cost	The total cost of performing the work of the request.	Currency
Workflow productivity	The number of requests completed or sum of total benefit generated in a given time.	Scaler number / time period or total benefit / time period
Standardization	% of total requests following standard procedures or runbooks.	Percentage
Resources needed	Number and roles of personnel involved in processing request workflow from L1 to L3.	Number of people by job role

For Incident resolution workflows, you might recognize these terms as:

### Metrics for Incident Resolution Workflows

Metric	Definition	Units
<b>MTR (Mean Time to Resolve)</b>	Mean cycle time for completing incident resolution workflows to resolve incidents.	Waiting time
<b>Processing time</b>	Time spent managing incident response, triaging and diagnosing problems, and remediating issues.	Elapsed time working, not including idle time where no work is being performed
<b>Processing cost</b>	Total cost in personnel time to resolve an incident.	Personnel hours or currency
<b>Incident response productivity</b>	Number of incidents resolved in a given period of time.	Scaler number / time period or total benefit / time period
<b>Error budget consumed</b>	Cost in hours of downtime, or lost revenue or business productivity due to downtime.	Currency or time / incident or total / time period
<b>Standardized triage</b>	Percentage of incidents occurring on systems with runbooks standardizing diagnostics & rule out procedures.	%
<b>Recurring remediation</b>	Percentage of incidents that are known recurring problems resolved by standard remediation in runbooks.	%
<b>Escalations</b>	Percentage of incidents escalated to L2 or L3 support.	%

Additional metrics you may wish to capture include:

- **Idle time:** average time requests sit idle with no work occurring on them – useful for calculating total wait time
- **Throughput:** a capacity metric for simultaneous processing of workflow cycles if available capacity is a bottleneck in meeting SLAs or urgency requirements.
- **Cycle benefit:** when a per run value can be attributed to a workflow, useful when that benefit is materially greater than the processing cost
- **Quality:** per cycle error ratio when errors related to the manual processing of the workflow are a source of increasing cost or delay

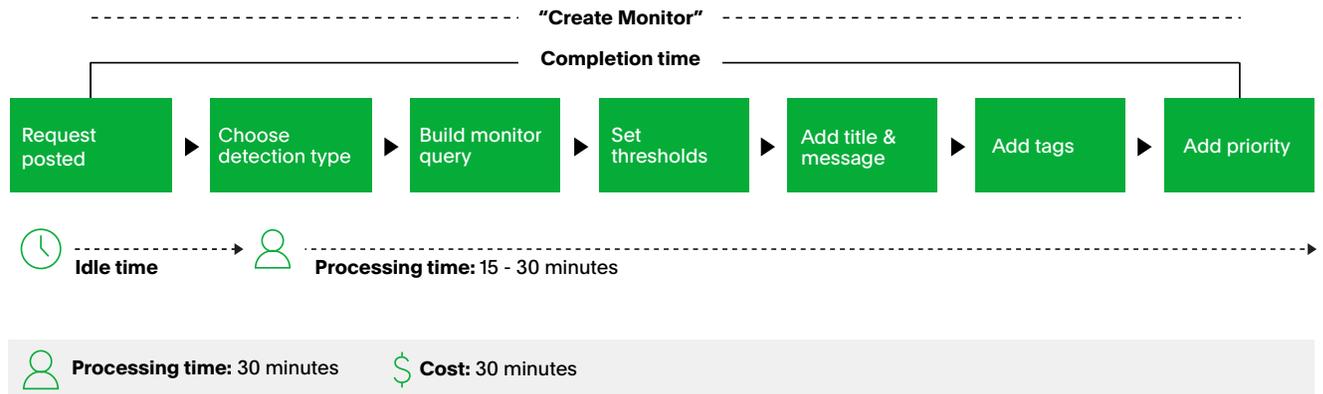
Once you've captured these metrics, you can also compute the following benefits:

- **Process Productivity:** Total completed cycles, or total benefit produced by a workflow over a given period of time. (Example: incidents closed / month, or \$3.2M liability reduction / year)
- **Process Efficiency:** Total completed cycles, or total benefit produced by a workflow, per person, over a given period of time. (Example: incidents closed / responder / month, or \$3.2M liability reduction / person / year)

Comparing *Process Productivity* and *Process Efficiency* values are a great way to show before and after effects of automation.

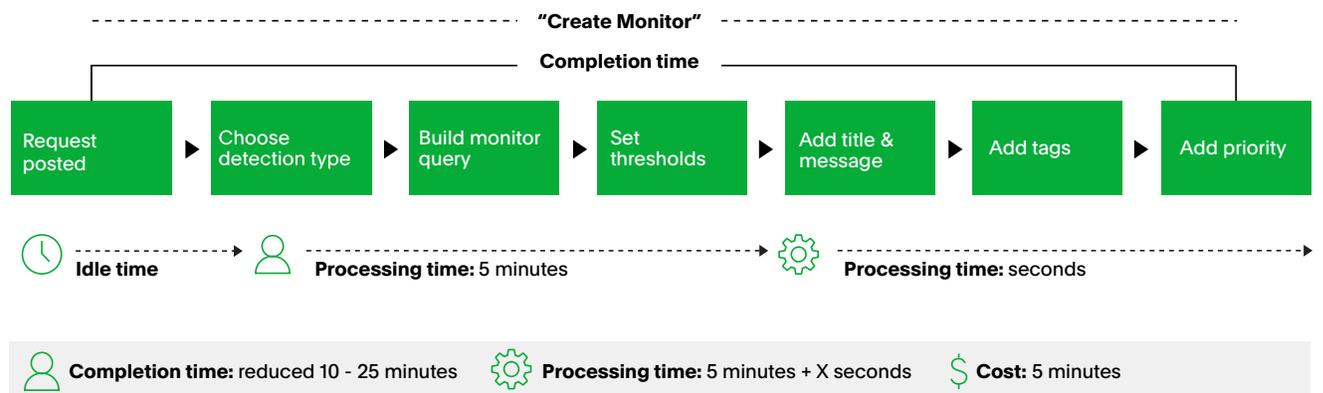
Here's an example of calculating these metrics for a workflow based on a use case shared by Brandon Kresge, SRE Manager at Fox Corporation in [his session at PagerDuty Summit 2022](#). In this before case, he shared a manual workflow his engineers used to set up new monitors in Datadog and connect them to PagerDuty. In this case, between 15 to 30 minutes of an engineer's time was spent completing all the steps of the workflow, *Processing Time*, which we can also attribute to the *Processing Cost* of running one cycle of the workflow.

Before (manual):  + 



In this use case, after applying human assisting automation for setting up Datadog monitoring alerts, Fox was able to reduce *Completion Time* by up to 25 minutes, and reduce *Processing Cost* by 83%.

After (assisting automation):  + 



## Accounting for costs of interruptions and waiting

Humans are not machines. There's an inherent overhead in not being able to focus on a subject at hand. In human-driven workflows, there are two major sources of context-switching overhead: being interrupted in what you are doing to work on something else urgently, and having to wait to get something you need to finish a task.

**Cost of interruptions:** Even if your job is 100% focused on taking calls and various requests, it takes time to reset your brain to be able to focus on a new, or resuming a prior task – context switching. This includes safely putting down the prior work, and then ramping up to learn the context of the next task, or catch up on a resumed task. Conservatively we estimate that changing tasks imparts an additional 20% overhead on the time spent on a task. So the cost of human *Processing Time* can be considered to be 120% of actual time spent doing work.

In the prior example, creating a Datadog to PagerDuty Monitor, when fully manual, could be considered to have a *Processing Cost* of 18 to 36 minutes as a result of the additional 20% overhead. With human assisted automation, this “fully loaded” *Processing Time* is reduced to 6 minutes, including 5 minutes of actual work being done by a human.

**Cost of waiting:** In theory, if you have to wait for something to be made available to you, or are dependent on a task being completed for you, there's overhead imparted. This comes from switching to other work while you wait for the dependency to be met. We estimate 40% as an average for “non-recoverable” wait time that can't be used for other value adding activity due to context switching costs, planning overhead, misaligned schedule windows, communication inefficiency, request follow-up, or other reasons.

This could be added on to the *Completion Time* as an additional factor similar to *Idle Time* where no work is being completed.

The longer the wait time or the expected SLA, the less this penalty might be. We use urgency and SLA to scale this factor:

- Urgent, 24 hours or less SLA: 40%
- Medium, 1 week or less SLA: 25%
- Low, 2 weeks or less SLA: 10%

So, a QA engineer's time waiting 24 hours to gain access to test deployed software for a problem might be seen as costing 9.6 hours (or 3.2 hours if we're only counting business hours). This would be calculated as a *Completion Time* of 33.6 hours. However, a developer waiting 2 weeks to be issued a new VM in a well established process with known SLA could be considered to have lost only 1 day in waiting. This would be calculated as a *Completion Time* of 15.4 days, or 11 days if we're only counting business days.

Eliminating interruptions and waiting times is another way to reduce overhead in a company, and automating tasks is a great way to achieve this.

# Measuring value of automation

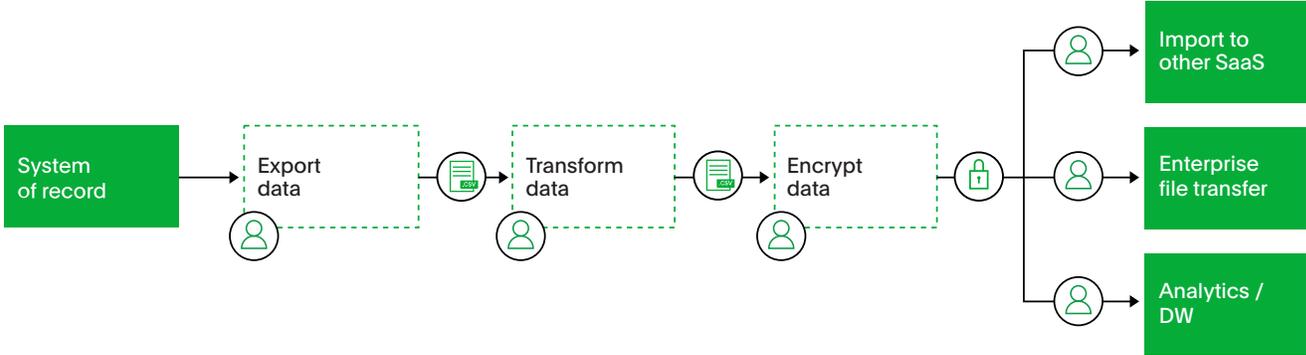
Let's explore a number of scenarios about how you might measure and report the value of your automation projects.

## Calculating value per automation run

The simplest model for calculating the business value of automation assumes value is generated whenever an automation runs. An excellent example is [this use case shared by Robert Powers from Brinks at PagerDuty Summit 2022](#). They counted labor savings per automation run for a recurring data transfer job that previously took a staff member 5 to 10 hours to complete manually.

### As-is Process

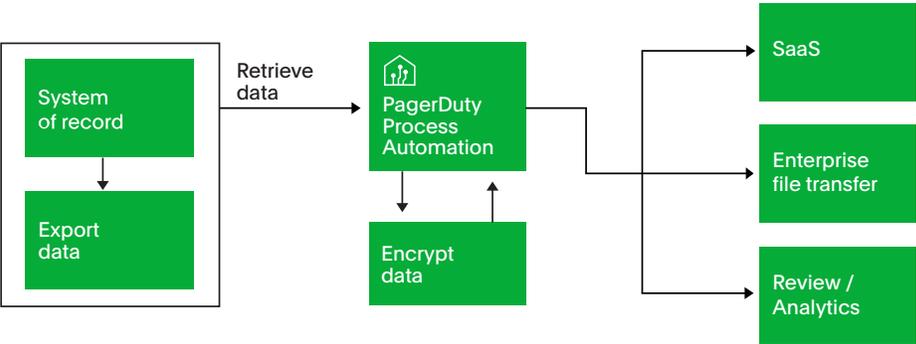
(Manual step-by-step)



By automating the process with PagerDuty Process Automation, they turned this process from being 1/4 of one person's job every week into an automated task that takes zero human time.

### To-be Process

(Fully automated in PagerDuty Process Automation)



<b>Cost</b>	<ul style="list-style-type: none"> <li>- 5 - 10 FTE hours / week = 520 FTE hours / year</li> <li>- Cost to automate: 20 FTE hours</li> </ul>
<b>Opportunity</b>	<ul style="list-style-type: none"> <li>- 99% reduction in FTE hours</li> <li>- Immediate payback</li> <li>- Errors more easily traced &amp; fixed, process runs more more frequently ensuring up to date operational systems</li> </ul>
<b>Complexity</b>	<ul style="list-style-type: none"> <li>- Moderate complexity: multiple steps, systems &amp; departments</li> <li>- Potential simplification by standardizing data transfer processes</li> </ul>
<b>Risk</b>	<ul style="list-style-type: none"> <li>- As is: stale data in operational systems &amp; human error</li> <li>- To be: Programmatic errors that pose low risk</li> <li>- Mitigation: immediate notification of automation failures</li> </ul>
<b>Maturity</b>	<ul style="list-style-type: none"> <li>- Well documented manual process</li> </ul>
<b>Business benefit</b>	<ul style="list-style-type: none"> <li>- Ops systems updated in less than a day, versus 1 week lag, IT resource savings</li> </ul>

The table above offers some data to compute some further metrics. Depending on how you might define the before-case *Completion Time*, you can compute the duration of a cycle from the scheduled start time. Or, if availability of the human resource is a limiting factor, you might argue the *Completion Time* was 7 days, being reduced to ½ a day considering the 2X per day automated execution. *Processing Time* was reduced by more than 99%. *Processing Cost* fell from 10 hours to less than .03 hrs per run, averaging in the time to automate the workflow.

	<b>Completion time:</b> 10 hrs to 0 hrs	<b>Or:</b> 7 days to ½ day
	<b>Processing time:</b> 10 hrs to 0 hrs	
	<b>Processing Cost:</b> 10 hrs to 0.03 hrs	
	<b>Throughput:</b> Increased x 14	
	<b>Quality:</b> improved	
	<b>Productivity:</b> 14 updates / wk 14X increase in productivity	<b>Before:</b> 1 update / wk
	<b>Efficiency:</b> 36 updates / human / wk 9X increase in efficiency	<b>Before:</b> 4 updates / human / wk

We can also see how increasing frequency of execution increases *workflow productivity* by 14X, while at the same time, replacing human effort improves *efficiency* by 9X.

Process Automation and Runbook Automation have a feature called the ROI Metric Data Plugin that makes it easy to compile per run data for future analysis and reporting. To learn more about it, read the blog [Calculating the Business Value of Automation in PagerDuty Process Automation](#) and check out the [Process Automation documentation](#).

## Showing how automation improves more complex workflows

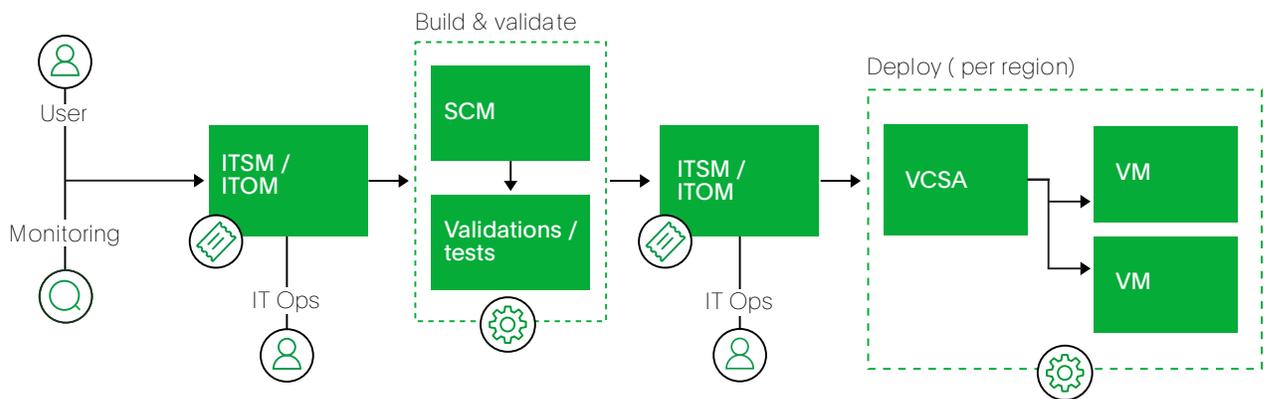
Automated tasks do not exist in a vacuum. They are part of a business workflow, with inputs, outputs, and potentially some human interaction. This means showing the business impact on a business workflow requires computing composite metrics. Many of those metrics will be compiled in the systems that initiate or end a workflow.

Let's look at another example [use case shared by Robert Powers from Brink's at PagerDuty Summit 2022](#).

Here is their as-is workflow for provisioning and deployment of virtual machines, which Robert reported was typically a 2 week process upon request – mostly waiting for technical specialists to pick up tasks in tickets.

### As-is Process

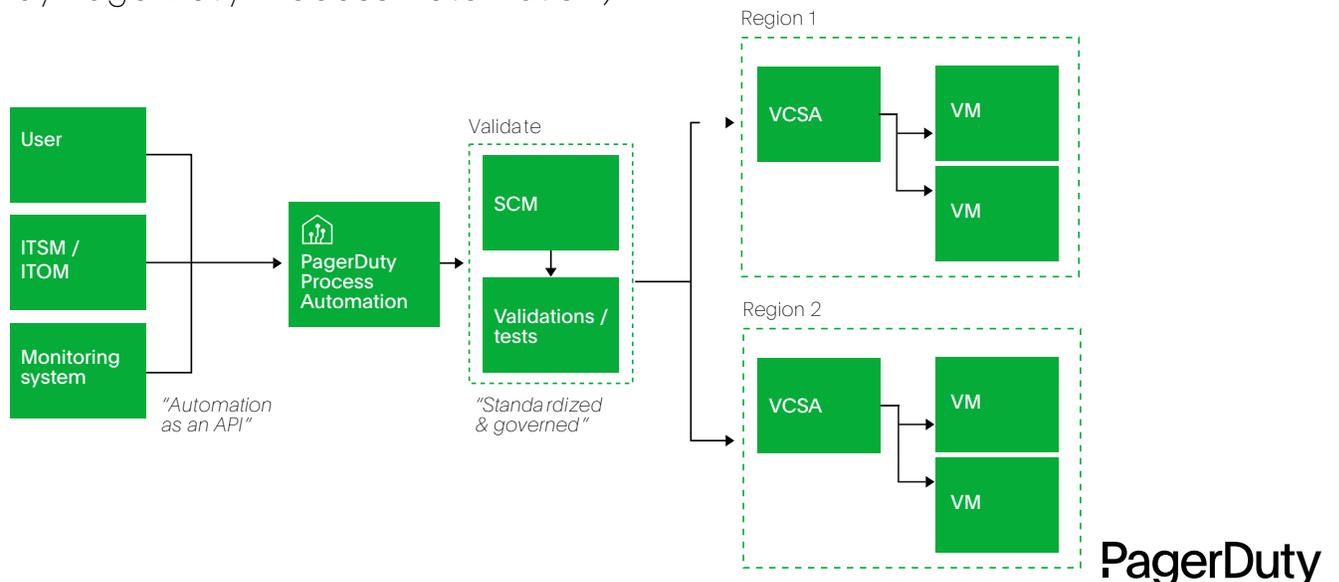
(Automation orchestrated by IT Ops)



They utilized PagerDuty Process Automation to automate the vast majority of this workflow, leaving it to end users to begin a cycle of the workflow as a self-service request.

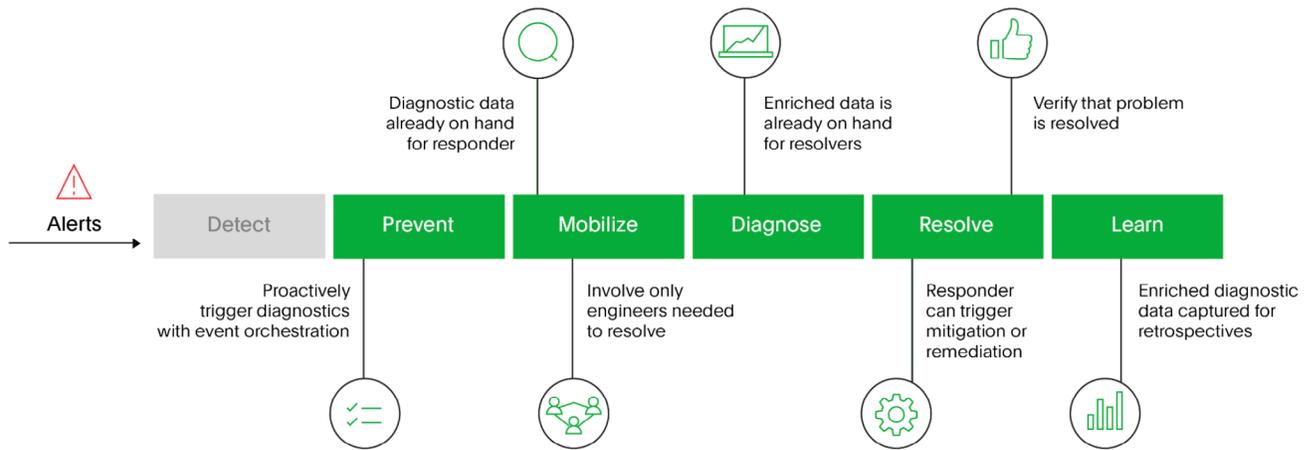
### To-be Process

(Delegated end-to-end process orchestrated by PagerDuty Process Automation)



While it should be possible to compute all the previously mentioned workflow metrics here, Brinks shared that their *Completion Time* from request fell from 2 weeks to 3 minutes, resulting from elimination of *Idle Time* and greatly reducing *Processing Time* and cost. This is one key benefit of self-service, scheduled, or triggered automation – huge reductions in *Completion Time* and *Idle Time*. Sure, a requester can work on all manner of back burner projects, but they are not able to immediately complete the urgent task that caused them to log a ticket.

Not all workflows can be fully automated, because in many cases human interaction may still be required. For example, in describing the benefits of automated incident resolution with PagerDuty, we state that automatic triage can save 15 to 30 minutes off MTTR (*Mean-Time-To-Resolve* – the *Completion Time* for resolving an IT incident in an incident response workflow). Even though diagnostic automation likely speeds up specific tasks by 99% or better, it's possible that a net new or infrequent fault will require human investigation and remediation assisted by automation, whereas a well known problem might be able to be fully remediated automatically 99% faster.



- Other examples of improved workflow metrics:
- [ResultsCX sees MTTR for network failovers reduced by 95%](#)
  - [Trimble sees self-service IT requests reduce Cycle Times from 5 days to 5 minutes](#)
  - [An Australian Bank sees an 85% reduction in maintenance time for software updates](#)

## Calculating value when automation becomes impossibly good

Consider the first use case again where Brinks reduced the personnel cost of a weekly data transfer process by 99%. This process doesn't just save a person's time, it also runs considerably faster. This then makes it possible to run automation far more often than might occur for a human-powered task. In the case of Brinks, their update frequency increased from weekly to more than once a day. Freshness of data has an intrinsic business value that is beyond the scope of this paper. However, the more frequent updates in this case could be compared to having more people manually running this job.

*10 human hours per cycle x 14 cycles per week = 140 hours total cost*

What if we were to run the update process once every 5 minutes, 24 hours a day, 7 days a week?

10 human hours per iteration x 2016 iterations per week = 20,160 hours saved, which is an impossibly good result. It would be nonsense to report labor savings of 500 employees per week in this case.

As you can see, labor savings have diminished value the more often an automation runs. One Process Automation user offered an alternative approach for such a scenario: don't measure each update execution, measure every instance of someone pulling that data as if a human had to gather fresh data for them right then.

So while there might be 2016 updates per week, maybe a downstream user looks at the data twice per day, 5 days per week. In such a case, the value you would report would be 100 hours of cycle savings.

To track such a metric, you would need a log of whenever the resultant data store was accessed.

From that number, we can generate our workflow metrics.

	<b>Completion time:</b> 10 hrs to 0 hrs	<b>Or:</b> 7 days to 0 day
	<b>Processing time:</b> 10 hrs to 0 hrs	
	<b>Processing Cost:</b> 10 hrs to 0.19 hrs	
	<b>Throughput:</b> Increased x 10	
	<b>Quality:</b> improved	
	<b>Productivity:</b> 10 updates / wk 10X increase in productivity	<b>Before:</b> 1 update / wk
	<b>Efficiency:</b> 26 updates / human / wk 26X increase in efficiency	<b>Before:</b> 4 updates / human / wk

While similar to the prior scenario's metrics, it's interesting to note that Cycle Time is 0 since the data is available on demand, similar to self-service automation. Actual value is similar to the value of a cache: how often is cached data hit vs. a miss.

## Computing value of improved operations

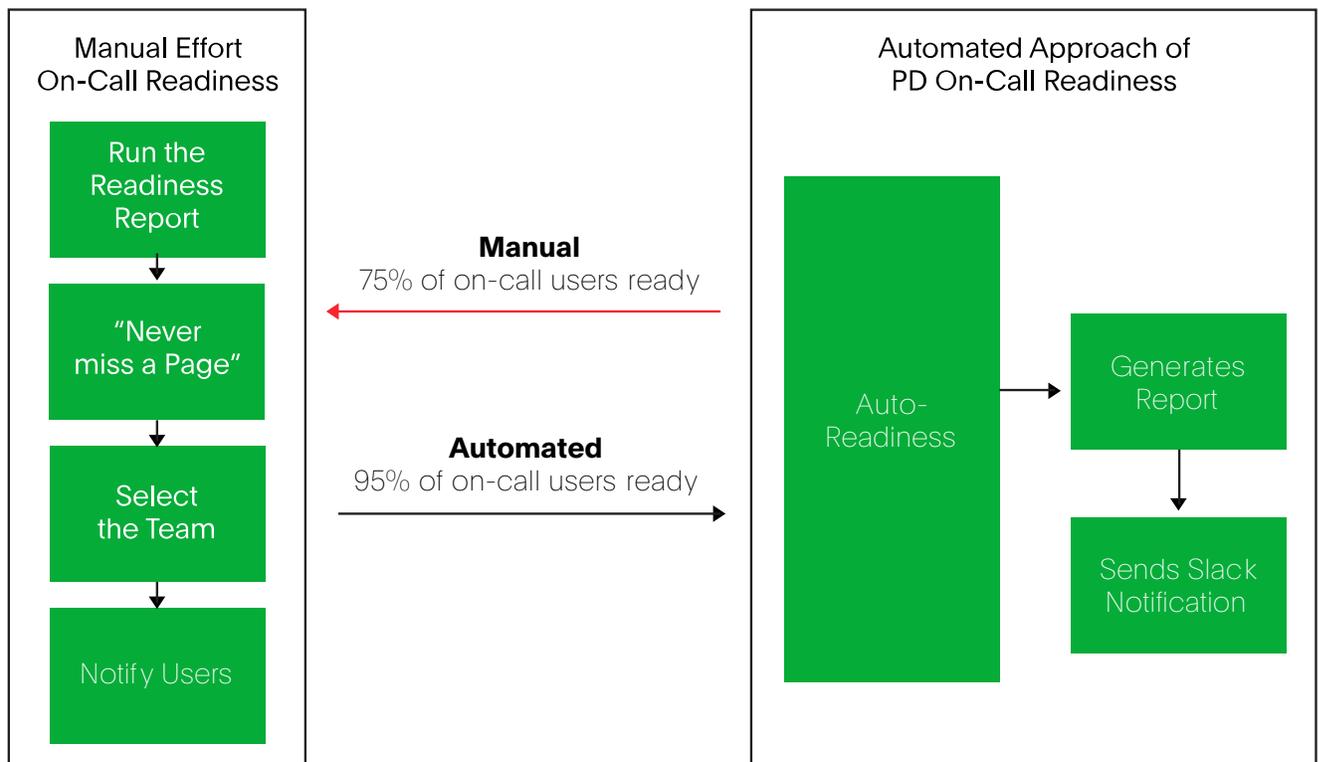
A lot of batch processes involve validation and verification of data or configurations. While it's possible to measure labor saved by not having a human make these checks, it's not a satisfactory measure of the potential business value provided. For example, if a validation process greatly reduces liability caused by missed deadlines, it would be more appropriate to express the business value delivered as that reduction in liability.

Example:

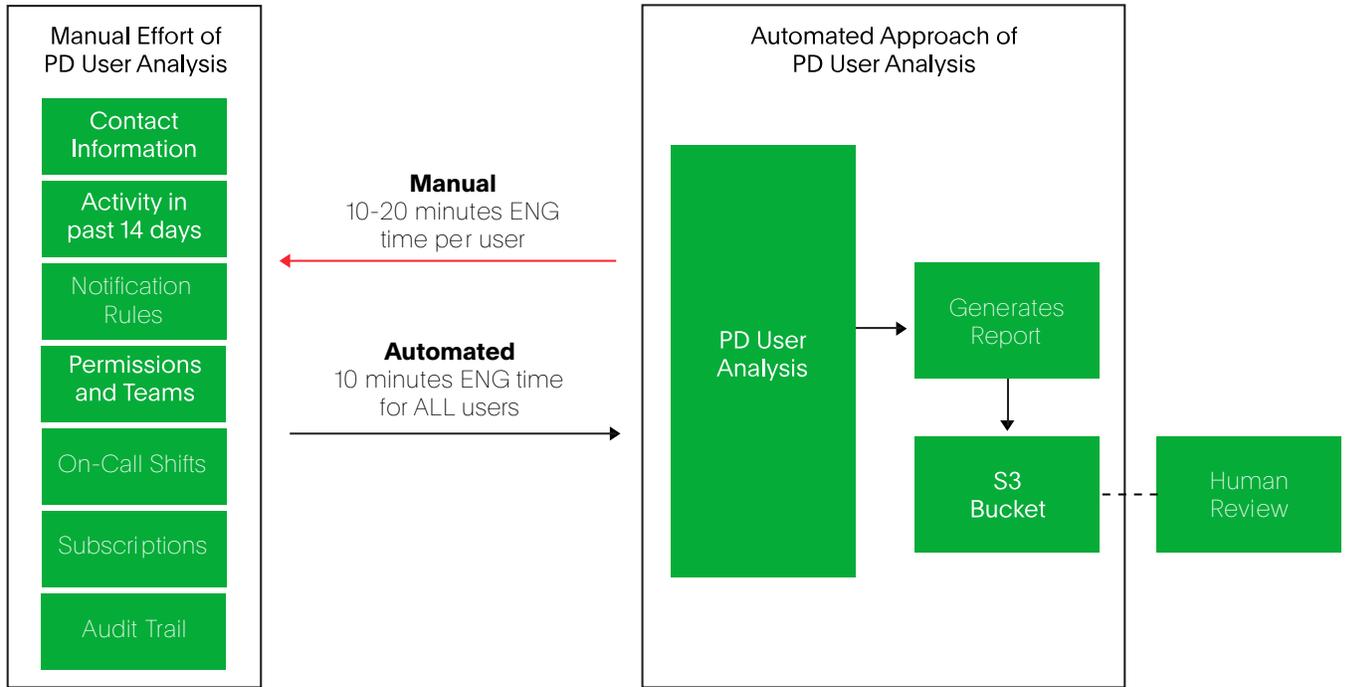
*A government reporting deadline imposes a \$1 million fine if a report is not filed within 3 days of a certain class of incident. An automated process is created that checks through incident history on a daily basis looking for unfiled reports of class member incidents, and generates an aging report. You could report the daily hours saved by not having a human do the checking and reporting. Or, you could report a reduction in liability by the number of incidents in the class, and any history of fines being levied before automation. Perhaps before automation, out of 500 reportable incidents per year, 2 deadline violations occurred. One could then claim a potential liability of \$4000 per incident and a 0.4% exception rate averaged over all 500 cases. If automation reduced this error rate to 0 even as reportable incidents increased to 800, you could claim a liability reduction of \$3.2 million.*

Similarly, a verification process might also improve the quality of operations. Here are a couple of examples provided by Brandon Kresge, SRE Manager at Fox Corporation in [his session at PagerDuty Summit 2022](#). His team utilizes Process Automation to verify and validate the configuration and activity of PagerDuty users:

- To see a 20% improvement in users being set up for on-call readiness:



- Turning a weeks-long auditing process of looking for inactive PagerDuty users into a 10 minute weekly report enabling them to repurpose inactive seats for new users.



It wouldn't take much to convert these metrics into downtime and end-user on-call reductions, as well as cost savings for the company.

Another example of improved operations includes:

- [Trimble is able to deploy an automated remediation for a new cause of incidents in half a day](#)

# Reporting on business value and ROI

If you've followed the advice so far, you should already have a variety of potential metrics to show improvements brought by automation to targeted business workflows. You should also know how you will compile them. While the detailed statistics may be interesting to some stakeholders, others will just want to know the overall benefits.

To summarize this impact, you'll need to know the relevance and contribution of your automated workflows to the top-line KPIs of the business processes they help implement. This is highly specific to the workflow, the business process, and your particular organization. Here are some guidelines.

1. Understand the nature of the business value of the workflow. Is it a core process related to generating or fulfilling revenue, such as sales, e-commerce, delivery, or invoicing? Is it a supporting process related to business expenses or cost control such as procurement, accounts payable, or IT productivity? Or is it a management process concerned with governance, reducing risk, and ensuring compliance such as IT security or HR?
2. What is the cycle value of the workflow you are automating, or the impact of its iterations? Per the metrics we discussed above, it should be possible to show cost improvements, faster processing times, increased capacity, improved quality, higher productivity & efficiency. You will want to relate these to the business function KPIs of the process.

For example, perhaps departmental goals include reducing the cost of sales or speeding up quoting, so reduced personnel costs of sales operations and shorter Completion Times for quote generation fit these KPIs. Another example in the case of customer support, if SLAs are consistently met with customers, improving profitability through higher productivity and efficiency of customer support workflows may be an impactful automation.

Finally, there is creating an analysis of the Return on Investment. For a monetary ROI calculation you'll need the following metrics:

1. Reduced costs of workflow execution
2. Reduced cost from reduction in errors
3. Increase in business value generated by workflow through better operation such as faster cycle times, higher throughput (example: higher data quality, faster software releases), ideally related to KPIs of the relative business process
4. Opportunity opened by freeing people to do other higher value tasks – add further cost savings or business value generated by additional tasks
5. Cost of your automation environment
6. Cost of time spent automating each workflow

Calculating the return on investment, or your net benefit is simply a matter of adding together benefits and subtracting out investments:

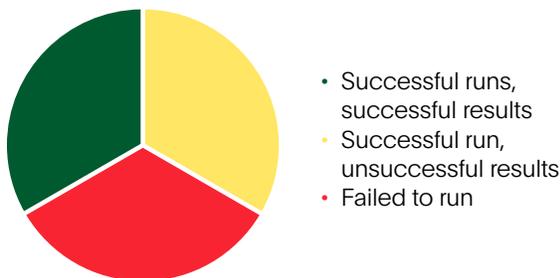
$$\begin{aligned}
 & \text{Reduced Costs} + \\
 & \text{Business value generated} + \\
 & \text{Value of other opportunities opened} + \\
 & \text{Cost of the automation environment} - \\
 & \text{Cost of time spent automating each task} - \\
 & \text{=====} \\
 & = \text{Net benefit}
 \end{aligned}$$

You may wish to include qualitative improvements that do not translate so easily to costs such as improved employee morale, improved customer satisfaction or net promoter scores.

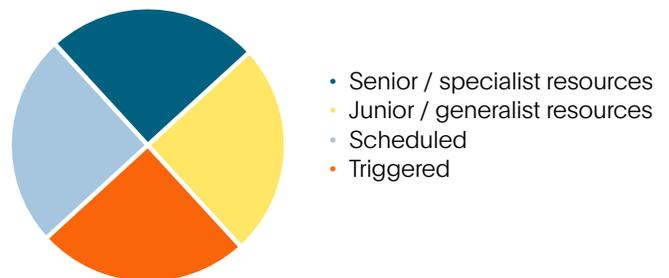
## Other ways to show the value of an automation program

In [his talk from PagerDuty Summit 2022](#), Jamie Vernon of ResultsCX offers a few additional program-level metrics you might want to compile:

**Total automation runs and their results**

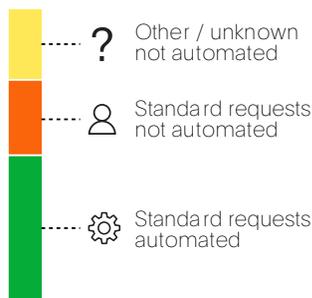


**How automation runs were initiated**

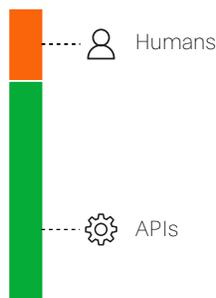


This makes it possible to show the full scope of an automation program such as:

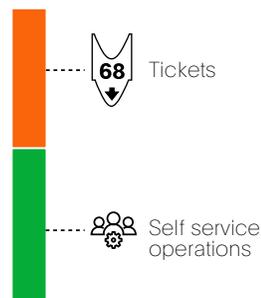
**% Requests automated**



**% Requests invoked by**



**% Requests available as**



## Commissioning a PagerDuty Business Value Assessment

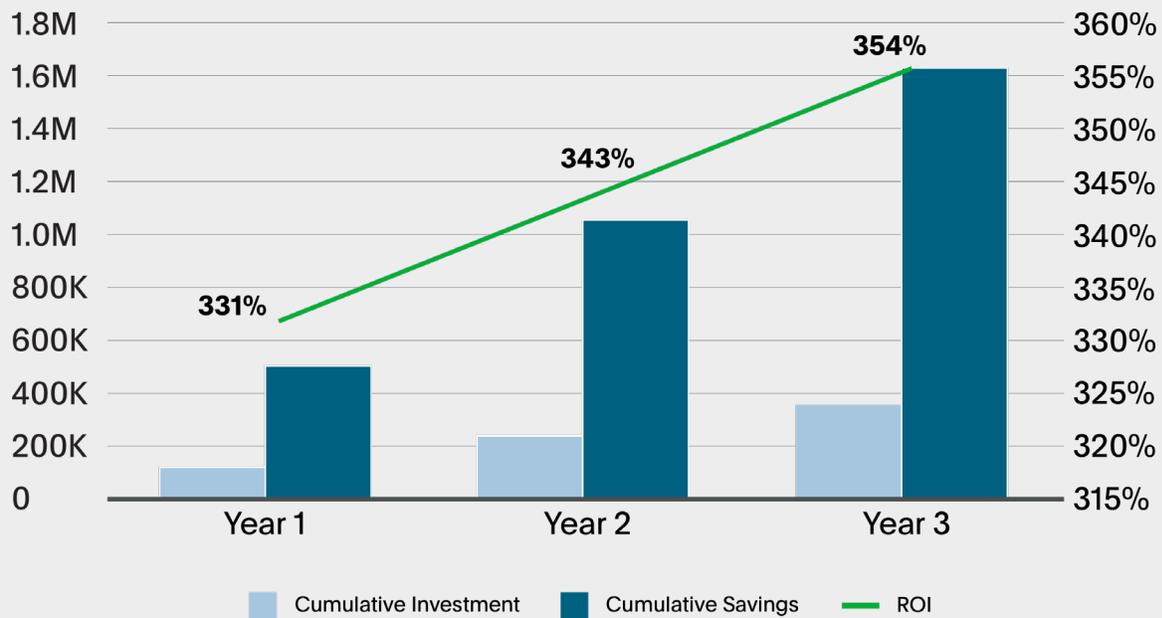
While it's certainly possible to create your own business value and ROI analysis, you might find it helpful to work with the Value Engineering team at PagerDuty. This is especially true if you are setting up an ambitious program. Our Value Engineers have experience with a wide variety of customer use cases incorporating the PagerDuty Operations Cloud, and can help you create a detailed forecast of potential benefits specific to your business needs. If you would like to have an assessment of potential business value of your automation program as depicted below, [please contact your Account Executive](#).

## Sample Business Value Assessment

### Annual benefits by value category

(Ramped benefits over 3 years)

### Cost vs. Benefit=Return



### Potential Impact

(Benefits over 3 years)



Annual savings of **\$511,523** based on year one investment of **\$118,800**.

\*Estimated cost and savings based on model only, not a substitute for proposal.

# Conclusion

The key to demonstrating business value for a PagerDuty process automation project is identifying the right metrics for the workflows you're automating. It is also important to tie them to KPIs and goals for the overarching business processes they support. Establishing a baseline, creating your forecast, and tracking the project's impact over time can help you demonstrate the value of automation to stakeholders across your organization. Focus on the benefits that matter most to your audience and tailor your approach to meet their specific priorities.

[Learn more about PagerDuty Process Automation.](#)

[Contact your Account Executive](#) to ask about a Business Value Assessment of your automation program.

## About PagerDuty

PagerDuty, Inc. (NYSE:PD) is a leader in digital operations management. In an always-on world, organizations of all sizes trust PagerDuty to help them deliver a better digital experience to their customers, every time. Teams use PagerDuty to identify issues and opportunities in real time and bring together the right people to fix problems faster and prevent them in the future. Notable customers include Cisco, DocuSign, Doordash, Electronic Arts, Genentech, Shopify, Zoom and more.

To learn more and try PagerDuty for free, visit [www.pagerduty.com](http://www.pagerduty.com). Follow our [blog](#) and connect with us on [Twitter](#), [LinkedIn](#), [YouTube](#) and [Facebook](#).