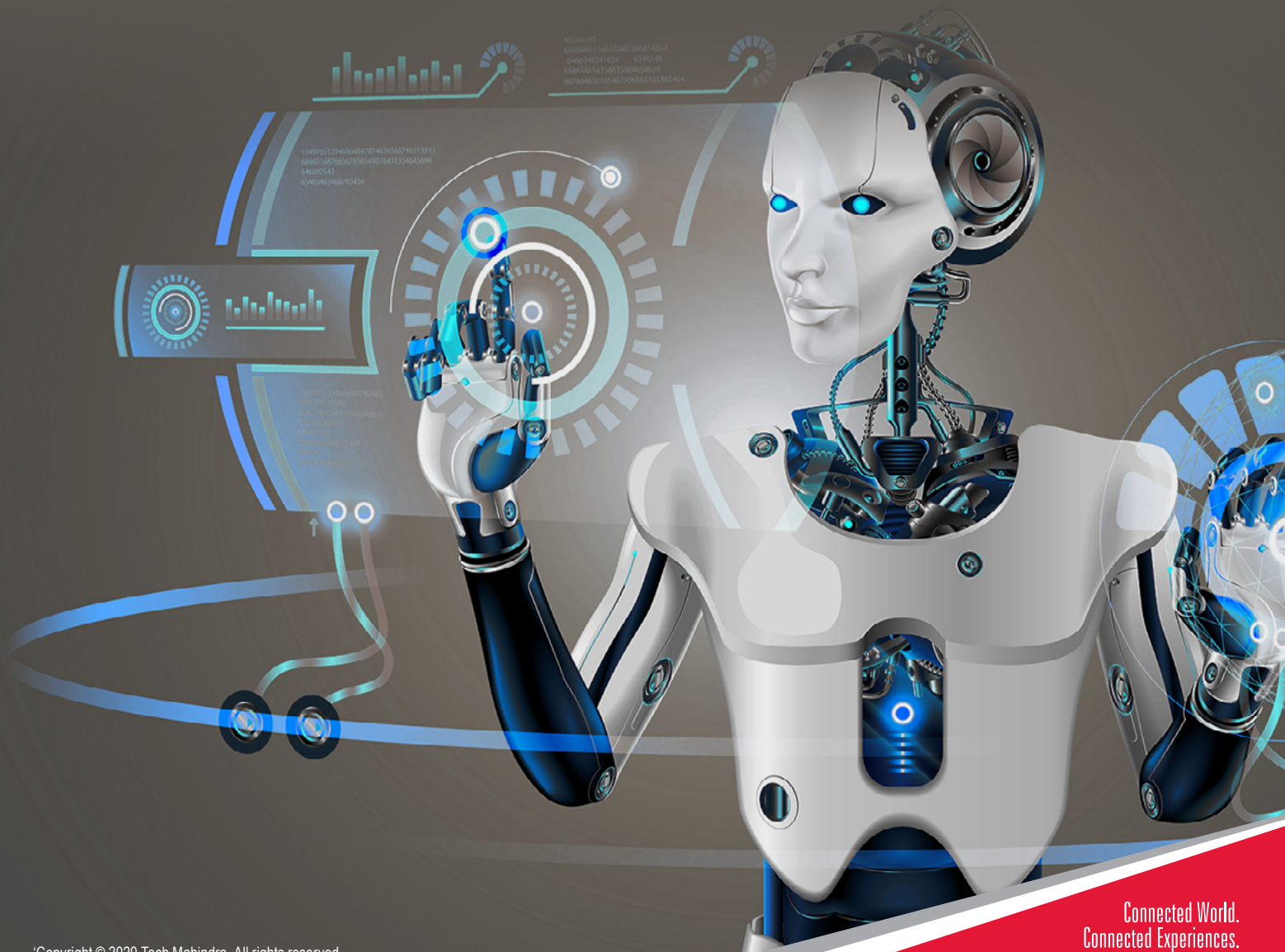


# ROBOTIC PROCESS AUTOMATION (RPA) & CONTINUOUS DELIVERY

Authored by

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## Robotic Process Automation (RPA) & Continuous Delivery

Hyper Automation using RPA to improve efficiency and cost reduction has been an area of focus for many businesses across industries for quite some time. In past few weeks, we have been part of many internal and customer conversations about how Cost Reduction through increased automation will be the core focus for next few quarters across industries.

From the IT perspective, the outlook is that; **most of the new investments in near future will happen in the areas where IT can justify to business that the investment will lead to short term ROI by reducing costs of operations or introducing a new feature that will lead to immediate new revenue streams.**

This also leads us to accelerate automation across all aspects of **IT delivery** to reduce cost of application development and maintenance/enhancements.

Coming back to RPA - as a standard definition that all of us have heard; **RPA technology uses a combination of software robots and artificial intelligence workers to optimize and automate business processes to reduce manual efforts and improve efficiency.**

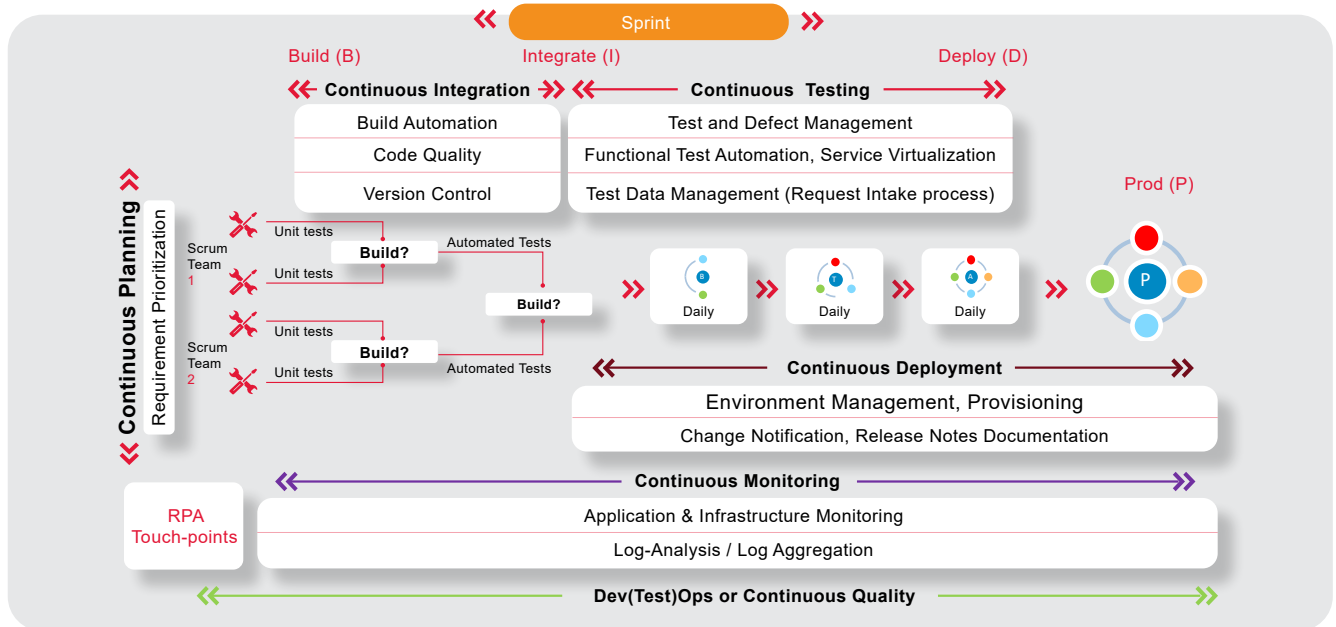
**RPA itself does not limit its usage to a specific type of process area. In fact, the focus on automation of IT process areas has been there for years.** If we analyze closely, there are many technical similarities between an RPA tool and say a Graphical UI Test Automation tool. These tools also automate user interactions with an interface or system. Now that is the similarity, however, while a Test Automation tool can be applied to a software product, RPA tools go to the next level and can be applied to a combination of process and product. That explains why RPA tools can be used for Test Automation but a Test Automation tool cannot be used for RPA.

Another interesting aspect to consider about the application areas for RPA when it comes to Software Delivery or IT Operations – while fully automated Enterprise Delivery Pipelines and zero touch deployments are ideal goals for a savvy CIOs, it may not be a reality for monolithic legacy systems anytime soon. **Many complex enterprise architectures/systems across industries are still a combination**

**of legacy and modern technologies. Onboarding such systems on fully automated delivery pipelines may only be possible through refactoring, re-architecting to micro services based architectures. In the meanwhile, RPA can come handy to resolve some of the delivery automation issues of some of these legacy application areas.** Let's quickly also level set, as to what DevOps is – simplistically, DevOps is a set of processes, practices, tools and methodologies that cuts across Software Development and IT Operations areas with the aim to optimize the Software Development Life Cycle and **enable Continuous Delivery of new features while maintaining high quality of the deliverables.** With this backdrop of RPA and DevOps & Continuous Delivery, **let's look into the key areas or what we can call as "RPA touchpoints" for enabling Continuous Delivery.** Though there can be many different ways to categorize this but we found it appropriate to categorize the touch points in the following segments:

- Continuous Planning
- Continuous Integration
- Continuous Testing
- Continuous Delivery
- Continuous Monitoring

## RPA touch-points & Continuous Delivery



Let's identify certain use-cases where technology like RPA can help with Automation & optimization, leading to reduced manual efforts, efficiency gains and cost optimization.

Now something that applies to identifying best suited processes for RPA – **if the process or use case is repetitive, prone to human error and is fairly rule based, then it is a good candidate for RPA based automation.** Volume can be another consideration – **is the IT team doing that task manually several**

**times in a day or is it once a week or twice a month activity?** As volume will drive the ROI of such automation.

The idea here is to identify use-cases that can potentially be candidates of RPA evaluation and implementation. **Not necessarily every IT organization has each of these as bottlenecks and ROI can be different for different teams – the idea is to start exploring** all tasks / processes in the Enterprise Delivery Pipeline that are manual and assess if RPA can help.

## Continuous Planning

Continuous Planning process – A way of planning, where plans are not long term rigid plans, but are based on lean principles and are agile enough to adapt to the changing circumstances. While Continuous Planning as a principle can be applied at any level in the organization; here the focus is on IT project planning and the use cases that we will look at, are related to that.

### Use Case #1

Requirement Prioritization and breaking down of requirements in Sprints (typically categorized by humans using certain parameters like critically, business impact, dependencies etc.)

### Use Case #2

Feature Allocation within sprints to the team members (Again a task generally carried out manually by Scrum Masters using certain criteria about loading, % completion of already allocated tasks etc.)

## Continuous Integration

The Process of automating the build and testing the code every time someone commits the changes to the version control system.

### Use Case #3

Analysis of Unit Test Results / Reports for completion (many times the % coverage through automation runs specifically on unit tests is not trusted by the teams and they employ specific manual checks to validate the correctness of these reports and coverages).

### Use Case #4

Post the Unit / Component Test Executions, categorization of bugs, allocations to respective teams.



## Continuous Testing

Now this is simple – easiest to understand concept – process of automatically testing builds, as they move from one quality gate to the next in the Continuous Delivery Pipeline. Also, automation is a key aspect that is used by all IT teams to reduce manual efforts in the continuous testing process. Automation of Unit, Component, Integration, E2E tests is very common. Though RPA tools can be used in some scenarios for these tests but generally are considered overkill for test automation at the Product / SW levels. However, there are certain areas of Testing Process that can be looked at, as real RPA candidates.

### Use Case #5

Test Set creations for test execution based on change analysis, release notes and any other inputs used by teams for Test Planning.

### Use Case #7

Environment / configuration / simple data changes for re-run of automation test sets

### Use Case #9

Level based and need based Status Reports Creations and Distributions.

### Use Case #6

Failed Automated Scripts analysis, categorization (Functional / Data / Config...).

### Use Case #8

Rule / Trend based Root Cause Analysis of Failures / Defects leading to Automated Defect Triaging and Allocations

### Use Case #10

UAT or Exploratory or User Experience simulations.

## Continuous Delivery

The idea of Continuous Delivery actually takes the Continuous Integration process forward and may or may not lead to Continuous Deployment – many times we have seen people use Continuous Delivery and Continuous Deployment interchangeably – however, there is a clear distinction.

### Continuous Integration

Dev Build



Unit / Component Test



Integration Test

### Continuous Delivery

Dev Build



Unit / Component Test



Integration Test



(Maybe Staging)



E2E Test / Acceptance Test for Deployment

### Continuous Deployment

Dev Build



Unit / Component Test



Integration Test



E2E Test / Acceptance Test for Deployment



Production Deployment

So, Continuous Delivery is the practice of streamlining and automating (to the extent possible) all processes leading up to the Deployment and following are some key RPA use cases that we can align

#### Use Case #11

Just in time Environment Provisioning after checking the request details and requirement specification of environments submitted by Dev / Test Teams.

#### Use Case #12

Release Check-List preparation, consolidating all key code and configuration changes.

#### Use Case #13

Coordination of Environment Dependencies between multiple agile labs / teams – when to trigger which build promotion, in which environment based on dependencies and constraints between builds / applications.

## Continuous Monitoring

Continuous Monitoring is also a broad concept and can be applied at various levels within an organization. In the context of SDLC and DevOps, continuous monitoring is a process and tools utilized to monitor application and associated infrastructure health in critical environments (mostly production or even staging), to ensure no disruption to the services. Continuous Monitoring also helps by proactively preventing outages due to environment / infrastructure issues. Let us identify some RPA touchpoints for Continuous Monitoring area.

#### Use Case #14

Production Log Aggregation and Analysis for trend based predictions

#### Use Case #15

Resource management – allocation and de-allocation of server/storage resources based on peak load analytics

There are more Operations specific use cases where there are examples of effective RPA utilization like backup / storage / patch management or Network Support or Production Incident triaging / auto allocation (similar to Test Defect triaging and allocation) etc.

**Based on these use cases, teams can get started in identifying potential repetitive manual tasks that can be automated using RPA. Having a core**

**team with understanding of end to end process of SW Delivery Pipeline is key to be able to optimize the processes and come up with business case for using RPA based automation for certain areas.**

Here are some before and after scenarios from various engagements, where we have successfully used RPA to automate manual processes in the Application Delivery apace.

## Case Example

### Before

Time and effort spent in setting up of driver scripts, test data and environment to enable running of E2E Automation scripts

### After

Custom BOTs executing the required driver scripts, configuration settings and data set-up processes to prepare the environment for Automation execution.

### Before

Whenever a test fails, considerable amount of time is spent in identifying whether the failure is a result of test script or application. Triaging and RCA also takes up bandwidth.

### After

BOTs enabling Auto healing of Test script in case of minor changes in configuration and data which might have caused test script to fail. Rule based Triaging BOTs help identify defect severity and allocate to concerned stakeholders.

### Before

Once the release is ready for deployment, BA compiles the list of features being released along with release notes and notifies impacted users.

### After

Automated identification of impacted users and transmission of release documentation without any additional effort.

### Before

Effort spent in aggregation and analysis of log data. Reactive measures taken after the occurrence of a failure.

### After

Log data converted to real time insights, resulting in proactive measures such as application tuning / adjustment of server capacity etc.

### Before

Multiple manual user experience testers and business users allocated for beta testing and exploratory testing for an ecommerce application.

### After

Automated user experience analysis through BOTS / Virtual users continuously trained to behave like end customers.

## To summarize

- RPA; though mainly promoted and considered for automation of mundane business processes and operations, it can definitely be looked at for automating SDLC process area, where 100% zero touch and automated enterprise delivery pipeline implementation is not possible through standard CI/CD/CT tools due to whatever constraints

- Key is to identify repetitive, manual tasks which are fairly rule based or well defined in the SW delivery process – through planning to monitoring

- IT Operations is an area that is already well entrenched and many organizations are using RPA successfully in this space

- Tech Mahindra team has worked with customers to identify and implement use cases for RPA fitment for Dev & Test teams to enable Continuous

Delivery that has reduced manual efforts from skilled IT workforce (Dev / Test community) for delivery at high velocity with improved quality

- To get started – form a small core team of IT process analysts to quickly identify some use cases that can provide ROI in short term – also investment in RPA tools is not necessary while getting started specifically with RPA implementation for IT process areas. There are enough open-source solutions / frameworks for getting started.

- Over engineering and analysis is not needed – most IT processes (even when manual) are much better defined as compared to many business processes. As far as key criteria of manual task, repetitive / mundane and fairly rule based, is met along with significant volume it is worth considering.

**Reach out to Tech Mahindra team to learn more about this and we will be happy to share our experiences and work along with you on this!**



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Anjali is a technology leader with 20 years of testing & QA leadership experience in Information Technology Services industry, with specialization in optimizing Software Development Lifecycle (SDLC) and Quality Assurance Services.

She has worked with large enterprise customers ranging from Banking and Financial Services, Telecommunication, Technology to various verticals. She has proven track record on DevQAOps Transformation initiatives, Consulting for DevOps and Agile Transformation initiatives, Automated Delivery Pipeline (CI/CD/CT) framework design and set-up for large enterprises, QA Community of Practice (COP) set-up, DevQAOps Program Management and Governance. In her role, she has worked with diverse IT teams globally to optimize SDLC with usage of Predictive Analytics, Machine Learning and RPA. She comes with in-depth understanding of Integrated SDLC Automation experience along with framework design / tool selection and ROI analysis.



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Pradeep has over 12 years' experience in Technology Consulting, Solution Implementation and Program Management for clients in different industry segments.

He has expertise in identifying Process Gaps, Areas of Improvement and Defining road-map along with tangible time-bound implementation goals.

These are based on interactions with stakeholders including Product Owners, Business Analysts and Technical Architects to identify opportunities to introduce and proliferate automation across the SDLC.

He has led multiple transformation initiatives and displayed visible improvements through combinations of process audits, tool evaluations as well as workshops



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