### ROI Measurement for Test Automation Projects

**A Case Study**

#### Table of Contents

1. Why Should We Measure ROI?  
2. How Should We Measure ROI?  
3. How to Measure ROI?  
4. Steps to improve ROI  
5. A Case Study  
6. Conclusion  
7. Contributions

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**Abstract**

Test Automation Projects:

- Return on investment (ROI) can be defined as a metric used to understand the profitability of an investment. It helps in understanding the potential return on investment and helps in making informed decisions about whether to invest in automation projects. ROI can be calculated using the formula:

\[ \text{ROI} = \frac{\text{Return} - \text{Investment}}{\text{Investment}} \]

where:

- Return is the gain or loss from an investment over a specified period of time.
- Investment is the cost of the investment.

ROI Measurement helps in:

- Identifying the high-priority business scenarios that are critical for the continuous delivery of software.
- Understanding the profitability of the investment. Also, how and by how much the investment has improved the process over time.
- Measuring anything will help in identifying the efficiency and the need for the right level of automation.

ROI Measurement can be used to determine:

- Whether effort that is put in is justified.
- Whether the new technology can save time and money, and also improve the process.
- Whether stakeholders would see value that it will deliver.

ROI Measurement helps in answering questions such as:

- Is the shift to automation worth performing?
- How much productivity is gained by automating test scripts?
- How much cost savings can be achieved?
- How much time can be saved by automating repetitive tests?
- Which framework and tools to choose to make the process efficient?

ROI Measurement is important for test automation projects, it will depict how many cycles of execution is needed to achieve breakeven point, and whether it is worth continuing with the automation projects. ROI measurement will help where business decision-makers can better understand the value that test automation delivers over time, and technical team members would get insights into the efficiency and the need for the right level of automation.

**Introduction**

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**Why Should We Measure ROI?**

### Why Should We Measure ROI?

- To get a buy-in from all the stakeholders. ROI measurement helps in answering questions such as:
  - Is the shift to automation worth performing?
  - How much productivity is gained by automating test scripts?
  - How much cost savings can be achieved?
  - How much time can be saved by automating repetitive tests?
  - Which framework and tools to choose to make the process efficient?

- To help in decision making on whether to shift from manual testing to automation.
- To help in determining the ROI of automation projects.
- To help in determining the cost savings that can be achieved by automation.
- To help in determining the productivity gain that can be achieved by automation.
- To help in determining the time saved by automation.
- To help in determining the right framework and tools to choose to make the process efficient.

**How Should We Measure ROI?**

### How Should We Measure ROI?

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**2. The types of automation for the project**

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**3. The tools required**

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**4. Steps to improve ROI**

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**5. A Case Study**

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**6. Conclusion**

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We have worked on a project where we started from developing the framework using open-source tools by integrating open-source external report into the tool. Over a period of 3 years team has developed 1600+ scripts and are maintaining them. These test scripts are executed for every sprint which is 14 days in duration. And these scripts are also executed for ad hoc release request.

Calculating ROI
Since ROI is a unitless number, it really does not matter whether the savings and investment amounts are in dollars or time. For ease in calculation, hours will be used because most of our inputs are in the form of time.

Before we actually start calculating the ROI, we need to consider all the factors or tasks which affect the ROI.

Here we would like to segregate all factors/tasks in 3 different areas mentioned below:

1. Initial time for development setup
2. Actual Development time
3. Monitoring and Maintenance time

Initial time for development setup
The pre-phase of the development activity involves parameters like setting up the automation tool, setting up different environments, exploring the applications, time spent for initial data setup etc.

Actual Development time
In this phase, all the development activities will take place. Parameters like the average number of scripts developed per day and average time to develop each script, code push and sanity check, code review, etc., can be considered to calculate the actual development time. For a manual testing one can consider average scenarios authored per day, average time to author each scenario, total time to review the test case document etc. can be considered to calculate the actual development time.

Monitoring and Maintenance time
This is the phase where automation saves a lot of time compared to manual testing. All maintenance-related activities can be considered as parameter to calculate the actual number of monitoring and maintenance hours.

Cost Savings
Savings is the difference between the cost of running a set of tests manually versus running the same tests automatically several times over some period.

Over 3 years, 72 regression run cycles we gain around 2000+ hours when compared to manual testing.

Let us consider another scenario, where after one year, the project ended or the test automation framework is abandoned; in either case, it would have been more cost-effective to go with manual testing.

Conclusion
ROI metric is important to get visibility on the success of test automation even before we start it. Hence this will help in making strategic decisions.