Rational PurifyPlus for Windows ROI Analysis

Rational®

the software development company

Table of Contents

Introduction

Rational® PurifyPlus empowers developers to deliver software with the reliability, performance and quality that users expect. PurifyPlus provides triple the benefit by combining the bug-finding capabilities of Rational Purify®, the performance-tuning effects of Rational Quantify® and the testing rigors of Rational PureCoverage®. The benefits of these combined products can be measured in better code, faster development times and fewer errors. In this white paper, Rational takes the analysis one step further by translating the benefits to the bottom line.

Rational PurifyPlus for Windows or Unix ROI (Return on Investment): The Bottom Line

Annual Savings   **$23,450**
First Year ROI   **567%**
Payback Period   **2.04 Months**

These calculations are based on information obtained through a survey conducted by an independent consultant. The goal was to measure and document actual experiences using Rational tools. Forty-three companies participated, representing manufacturers (automobiles and components, computers and components, aircraft, medical equipment), software companies (CAD, CASE, Database, Systems Software, Medical Imaging), service companies (banking, finance, insurance, hospitals), and universities. Most respondents were employees of large organizations (over 500 employees, with revenues over $100M annually). Most were from North America. The majority of the respondents had titles such as "technical lead," "project leader," or "senior software engineer."

Rational PurifyPlus for Windows or Unix ROI Methodology

The PurifyPlus ROI was calculated based on a survey that examined savings resulting from the use of Rational Purify, Quantify, and PureCoverage individually. PurifyPlus provides these three products in a single package. The following results were obtained from the analysis:

Product	Average Pay Back Period (months)	Average Return on Investment
Purify	.73	1,492%
Quantify	1.07	1,100%
PureCoverage	1.07	1,100%
PurifyPlus	**.51**	**2,337%**

These results include only quantifiable additive results. No attempt was made to extrapolate a 'value' for synergistic effects. For example, PureCoverage, when used in conjunction with Purify, identifies sections of code that have not been fully tested with Purify. This information can be used to create more thorough tests and a higher ROI in terms of Purify usage. This additional ROI would be realized when using the combined products in PurifyPlus, but it was not included in these calculations. In actual use, PurifyPlus offers an even faster return and higher ROI than the numbers shown.

Rational PurifyPlus Saves Time and Money

As detailed below, Rational PurifyPlus can save a developer 4.5 weeks a year by eliminating time that would have been spent fixing bugs or addressing performance issues. Additionally, PurifyPlus can save $7,000 per developer per year by catching bugs before shipment. Here's how:

Spend less time fixing bugs!
Save 2.6 weeks per developer per year.

Research has shown that three critical memory access errors occur per month per team; with a median working group team of 5 developers. That amounts to 0.6 errors per month per developer. On average, it takes 16 hours to find memory access errors using conventional tools.

0.6 errors/month per dev.@ 16 hours/error = 9.6 hours/month spent fixing memory errors

When using PurifyPlus to find runtime errors, sixty percent of the respondents estimated a productivity gain of a factor of ten times (10x), which means that errors that previously took ten hours to find and correct could be corrected in one hour. By applying this 'Purify Productivity Factor' of 10, the average developer would spend less than an hour each month fixing memory errors: 9.6 hours spent using conventional tools * 1/10 (Purify Productivity Factor) = 0.96 hours/month. That represents a savings of 8.64 hours per month per developer (9.6 – 0.96 = 8.64). If you annualize the savings, 8.64 hours/month * 12 months = 103.7 hours/year. With a 40-hour week, this translates into a savings of 2.6 weeks per year (103.7 hours/40 hours = 2.6 weeks)

Spend less time addressing performance issues
Save 1.96 weeks per developer per year

Research has shown that the average programmer spends around 5% of his or her time in the task of optimizing/improving performance. That amounts to 2.4 weeks per year without PurifyPlus: 0.05 * 48 weeks per year = 2.4 weeks/year. When using PurifyPlus to address performance issues, there was an estimated productivity gain with a factor of five times, which means that errors that previously took five hours could be corrected in one.

After achieving this 5 times 'Quantify Productivity Factor', the average developer would spend only .48 weeks per year addressing performance issues: 2.4 hours spent using conventional tools * 1/5 (Quantify Productivity Factor) = 0.48 weeks/year. That represents a savings of almost two weeks per developer per year (2.4 – 0.48 = 1.92).

Save $7,000 annually by catching bugs early

PurifyPlus improves error detection by highlighting the parts of code that have not been thoroughly tested and so may still contain bugs or performance issues. By detecting bugs early, PurifyPlus provides a significant savings. The accepted industry norm holds that bugs fixed before software is shipped are 10 times less costly to fix. An average of 10 additional bugs were caught per developer over the course of a year using PurifyPlus, compared to developers not using the product.

Costs to fix a bug after software shipment was estimated to be $700 more than before shipment. By catching bugs early PurifyPlus saves $7,000 per developer per year.

10 bugs * $700 cost after shipment = $7,000

Rational PurifyPlus for Windows or Unix ROI Details

The combined savings in using PurifyPlus in its entirety includes 2.6 developer-weeks for using Purify and 1.9 developer-weeks for using Quantify for a total of 4.5 developer-weeks or $16, 480 (see below for calculations). Adding the annual $7,000 saved by catching bugs early results in an annual dollar return of $23,450. This annual savings, along with the following figures provide the baseline from which the PurifyPlus RIO was calculated.

Annual Programmer Cost	**$175,000**
Weekly Programmer cost	**$3,646**
Price of Purify	**$995**
Yearly Maintenance Cost for Purify	**$199**
5x Productivity Savings	**22.56 Days**
$ Value of Improvement	**$23,450**
Payback Period	**.51 Months**
First Year ROI	**2,337%**
Net Present Value (3 years; 10% rate)	**$56,827**

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