



FORRESTER®

The Total Economic Impact™ Of OpenLegacy

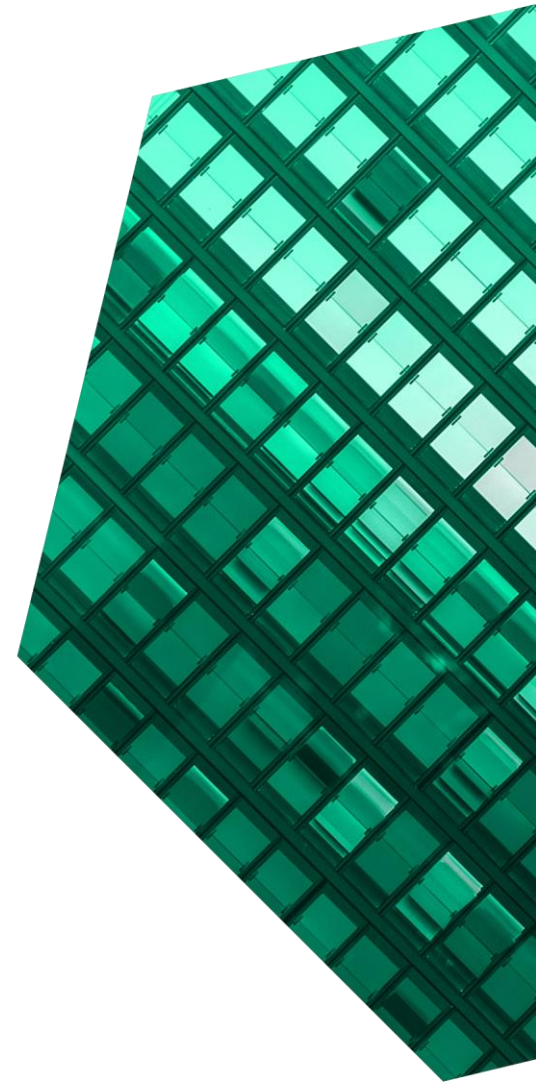
Cost Savings And Business Benefits
Enabled By OpenLegacy

AUGUST 2021

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Executive Summary

As organizations ready themselves for evolving innovation needs, core IT systems need to adapt to cloud-enabled, agile architecture to remain future-fit. The accessibility and connectivity to mainframe and mid-range systems therefore, plays a critical role in ensuring digital capabilities have the means to address business needs in an efficient and effective way.

OpenLegacy's solution is a digital modernization platform that enables organizations with legacy systems to release new digital services faster and easier, with direct integrations to core systems, automated micro-services and API components.

OpenLegacy commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying [OpenLegacy](#)¹. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of OpenLegacy's solution on their organizations.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed one OpenLegacy customer. Forrester used this experience to project a three-year financial analysis of the OpenLegacy solution.

Prior to using OpenLegacy, the customer was building integration layers through microservices and home-based ESB architecture. While ESB is still a part of its integration strategy, the customer realized that more agility and flexibility was needed in its mainframe integrations and protocols.

After the investment in OpenLegacy, the customer was able to build an automated end-to-end flow, faster API production and connectivity to the mainframe. This led to better performance, especially at the CICS level.

KEY STATISTICS



Return on investment (ROI)

353%



Net present value (NPV)

\$5,554,073

KEY FINDINGS

Quantified benefits. Risk-adjusted present value (PV) quantified benefits include:

- **OpenLegacy contributed over \$4.1 million in digital innovation cost savings over a three-year horizon.** As part of its digital innovation and integration, the customer initially set aside budget for legacy integration, development and maintenance efforts. OpenLegacy's ease of standardization and automation, contributed to a 67% reduction in investment required for legacy integration costs per year.
- **MIPS expense reduced by half, enabling a \$450,000 cost saving every year.** Simplified ESB integration layer with OpenLegacy and direct access to the mainframe reduced the Millions of Instructions Per Second (MIPS)

required, enabling a 50% reduction in MIPS expense for the customer.

- **\$852,228 cost savings from API development efficiency potentially enabled better allocation of investment towards digital transformation.** Auto-generation of microservices based APIs with OpenLegacy enabled 30 hours of time saving per API developed. This allowed the customer to see better developer productivity, and led to faster time-to-market for digital initiatives.
- **Half of FTE efforts required in DevSecOps pipeline.** Simplification of mainframe integrations allowed the customer to require less FTE efforts on DevSecOps pipeline, saving close to \$1.3 million across a three-year horizon.

Unquantified benefits. Benefits that are not quantified for this study include:

- **Standardization and automation of processes.** With the predominant ESB architecture before OpenLegacy, the customer was unable to have a structure and process around API development and MIPS calls from the mainframe. The ease of automating processes with OpenLegacy enabled the customer to simplify mainframe queries and build efficiency in end-to-end processes.
- **Visibility and monitoring of business flow.** OpenLegacy enabled a better ease of changing or improving processes, helps build better connectivity overall to the mainframe, while also providing easier and faster maintenance, according to the customer interviewed.
- **Scalable and secure architecture.** Previous security levels for CICS were based on message queueing and did not meet business needs. OpenLegacy's integration and simplicity allowed the interviewed organization to scale a better and more secure architecture.

Costs. Risk-adjusted PV costs include:

- **Customer incurred \$496,500 on average in implementation costs every year.** Based on the parameters and effort required for the customer's integration needs.
- **Labor costs of \$169,890 over a three-year horizon.** The customer indicated an average of three to four people required internally to manage OpenLegacy's initial set up and ongoing development in the organization.

The interview and financial analysis found that this customer experiences benefits of \$7,128,963 over three years versus costs of \$1,574,890, adding up to a net present value (NPV) of \$5,554,073 and an ROI of 353%.



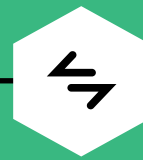
ROI
353%



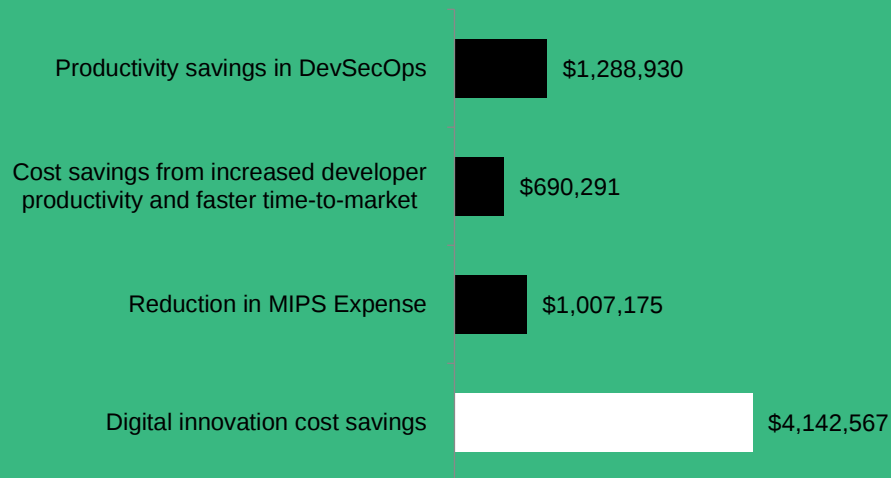
BENEFITS PV
\$7,128,963



NPV
\$5,554,073



PAYBACK
<6 months



Cost savings in digital innovation and legacy integrations accounts for 58% of total benefits incurred.

TEI FRAMEWORK AND METHODOLOGY

From the information provided in the interviews, Forrester constructed a Total Economic Impact™ framework for those organizations considering an investment in OpenLegacy.

The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision. Forrester took a multistep approach to evaluate the impact that OpenLegacy can have on an organization.

DISCLOSURES

Readers should be aware of the following:

This study is commissioned by OpenLegacy and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.

Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the study to determine the appropriateness of an investment in OpenLegacy.

OpenLegacy reviewed and provided feedback to Forrester, but Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.

OpenLegacy provided the customer name for the interview but did not participate in the interview.



DUE DILIGENCE

Interviewed OpenLegacy stakeholders and Forrester analysts to gather data relative to OpenLegacy.



CUSTOMER INTERVIEW

Interviewed decision-makers at an organization using OpenLegacy to obtain data with respect to costs, benefits, and risks.



FINANCIAL MODEL FRAMEWORK

Constructed a financial model representative of the interview using the TEI methodology and risk-adjusted the financial model based on issues and concerns of the interviewed organization.



CASE STUDY

Employed four fundamental elements of TEI in modeling the investment impact: benefits, costs, flexibility, and risks. Given the increasing sophistication of ROI analyses related to IT investments, Forrester's TEI methodology provides a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

The OpenLegacy Customer Journey

■ Drivers leading to the investment in OpenLegacy

INTERVIEWED ORGANIZATION

Forrester interviewed an OpenLegacy customer with the following characteristics:

- Global 2000 financial institution.
- \$4.36 billion in annualized revenue covering banking services for 2.5 million customers.
- Over 10,000 employees, with 250 bank branches.

KEY CHALLENGES

The interviewed organization was keen to work on a large modernization project, migrating their mainframe to a more flexible and accessible platform that aligns to current and future digital needs.

However, to enable this modernization, the interviewed organization struggled with common challenges, including:

- **Lack of flexibility and agility in mainframe integration.** Refactoring key parts of the core system with new microservices based layers required better flexibility in the integrations to the mainframe, which the interviewed organization was not able to optimize with just its existing ESB architecture. The organization needed to connect to the mainframe better, leading them to OpenLegacy's solution and approach.
- **Better and faster time to market.** Core systems were seeing a bottleneck in development and maintenance processes, which impacted time-to-market. Traditionally, building more capacity would require more people and TCO increases, but the organization couldn't afford this. Hence, looking for a system that organized and automated processes better to reduce bottlenecks was needed.

- **Standardization and automation of processes.** In order for DevSecOps development and better performance to be realized, the interviewed organization required better automation of end-to-end processes and integration flows. Enabling a platform that optimized the mainframe with an optimal integration layer beyond the current ESB architecture was needed to address these broader IT objectives.

USE CASE DESCRIPTION

With these challenges and strategic objectives on mainframe modernization in mind, the interviewed organization started implementing OpenLegacy in 2018, by managing processes in the CICS transactions of the institution. The OpenLegacy layer handles communications with the core CICS processes, helping with automated API generation, cache integrations, along with CI/CD pipeline integrations.

For this use case, Forrester has modeled benefits and costs over three years.

Key assumptions

- **2,000 applications managed**
- **10% of applications with OpenLegacy and current CICS integrations**
- **\$65 per hour cost per developer**

Analysis Of Benefits

■ Quantified benefit data

Total Benefits						
Ref.	Benefit	Year 1	Year 2	Year 3	Total	Present Value
Atr	Digital innovation cost savings	\$1,665,788	\$1,665,788	\$1,665,788	\$4,997,364	\$4,142,567
Btr	Reduction in MIPS expense	\$405,000	\$405,000	\$405,000	\$1,215,000	\$1,007,175
Ctr	Cost savings from increased developer productivity and faster time-to-market	\$182,520	\$282,204	\$387,504	\$852,228	\$690,291
Dtr	Productivity savings in DevSecOps	\$504,000	\$519,120	\$534,694	\$1,557,814	\$1,288,930
Total benefits (risk-adjusted)		\$2,757,308	\$2,872,112	\$2,992,985	\$8,622,405	\$7,128,963

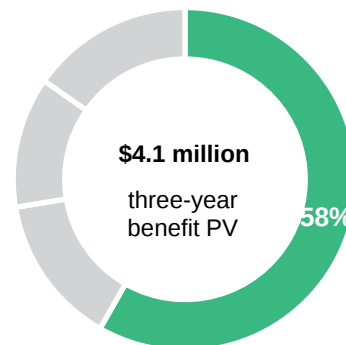
DIGITAL INNOVATION COST SAVINGS

Evidence and data. In efforts to migrate to architecture fit for digital innovation, the customer had allocated specific funds and initiatives for legacy integration projects.

- Before OpenLegacy's adoption, the customer allocated a net budget of up to \$4.5 million for mainframe and legacy integration efforts such as refactoring to a new microservices layer, API development and maintenance efforts to the core system.
- OpenLegacy's automated API development, standardization of processes and streamlining of digital development enabled the customer to avoid additional investment into integration solutions and effort on processes.
- With OpenLegacy, the customer's investment cost on legacy integration reduced to \$1.5 million per year, a 67% cost saving that could potentially be re-invested into other digital innovation and product initiatives.

Modeling and assumptions. Forrester makes the following assumptions in quantifying this benefit:

- 65% attribution ratio to OpenLegacy, considering its most developed use case being the CICS development, and the consideration of other ongoing processes, in-house ESB integration improvements that could also contribute to the cost efficiency.



"With OpenLegacy, we saw better end-to-end automation flows, which helped in our integration efforts at the CICS level"

- Chief IT architect of a Global 2000 financial institution

Risks. This benefit calculation considers the following risks

- Assumptions on cost savings estimations by interviewed customer.
- Assumptions on attribution ratio to OpenLegacy solution

Results. To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of \$4,142,567.

Digital Innovation Cost Savings					
Ref.	Metric	Source	Year 1	Year 2	Year 3
A1	Estimated budget for legacy integration projects before OpenLegacy	Customer	\$4,500,000	\$4,500,000	\$4,500,000
A2	Reduction in legacy innovation costs with OpenLegacy	Customer	67%	67%	67%
A3	Net legacy integration costs after OpenLegacy	A1*(1-A2)	\$1,485,000	\$1,485,000	\$1,485,000
A4	Net savings in legacy integrations costs	A1-A3	\$3,015,000	\$3,015,000	\$3,015,000
A5	Attribution ratio	Assumption	65%	65%	65%
At	Digital innovation cost savings	A4*A5	\$1,959,750	\$1,959,750	\$1,959,750
	Risk adjustment	↓15%			
Atr	Digital innovation cost savings (risk-adjusted)		\$1,665,788	\$1,665,788	\$1,665,788
Three-year total: \$4,997,364			Three-year present value: \$4,142,567		

COST SAVINGS IN MIPS EXPENSE

Evidence and data. Open Legacy's direct connectivity to the mainframe enabled a significant efficiency in the Millions Instructions Per Second (MIPS) expense.

- Direct connectivity to the mainframe and simplified architecture allowed a 50% reduction in MIPS expense.
- This brought a \$500,000 cost saving every year in MIPS expense on digital services in the mainframe.
- The interviewed customer noted that "resource efficiency" was a critical factor in their decision-making, especially in the MIPS management, and OpenLegacy helped considerably in making this aspect more efficient.

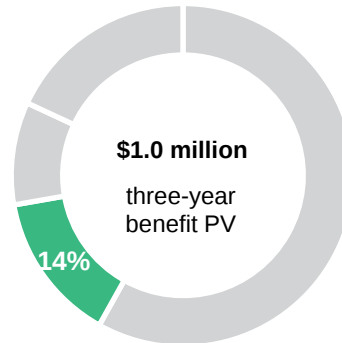
Modeling and assumptions. This financial model makes the following assumptions on this benefit category.

- 90% of this benefit is attributed to OpenLegacy's solution, considering the estimations on MIPS expense and attributions considered by the interviewed customer.

Risks. This financial model considers the following risks.

- Assumptions on consistency of MIPS expense reduction over a three-year horizon.
- Estimations by customer and assumptions on attribution ratio, considering gradual migration efforts with OpenLegacy.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$1,007,175.



Cost Savings In MIPS Expense

Ref.	Metric	Source	Year 1	Year 2	Year 3
B1	MIPS expense on mainframe digital services before OpenLegacy	Customer	\$1,000,000	\$1,000,000	\$1,000,000
B2	Reduction in MIPS cost with direct access to mainframe with OpenLegacy	Customer	50%	50%	50%
B3	MIPS cost saving from OpenLegacy	B1*(1-B2)	\$500,000	\$500,000	\$500,000
B4	Attribution ratio	Assumption	90%	90%	90%
Bt	Reduction in MIPS Expense	B3*B4	\$450,000	\$450,000	\$450,000
	Risk adjustment	↓10%			
Btr	Reduction in MIPS expense (risk-adjusted)		\$405,000	\$405,000	\$405,000
Three-year total: \$1,215,000			Three-year present value: \$1,007,175		

COST SAVINGS FROM INCREASED DEVELOPER PRODUCTIVITY AND FASTER TIME-TO-MARKET

Evidence and data. Ease of API creation with OpenLegacy has allowed the interviewed customer to experience faster integrations that has positively impacted time to market on key legacy improvements and digital initiatives.

- The interviewed customer described that before OpenLegacy, it took close to 35 hours per API development. This reduced to 5 hours with the automated API generation and standard API development for the CICS level.
- The interviewed customer indicated that currently 10% to 15% of applications run on SDK, that OpenLegacy API development is helping in

building the distribution layer for. However, this is expected to grow over time.

- The reduced time and effort from the developer teams and increased time efficiency enabled a \$852,228 in cumulative cost savings over a three-year horizon.
- Enabling faster and easier productivity gave the interviewed organization the opportunity to level-up their legacy integrations for the new digital initiatives required.

“Developing an API based on CICS transaction is now as easy as developing a Java API, with the same eco-system, the same standard & convention”

- *Chief IT architect of a Global 2000 financial institution*

Modeling and assumptions. Calculations for this benefit considers the following assumptions.

- The interviewed customer indicated close to 2,000 applications, and 10% of this is assumed to

be managed across the distribution layer with OpenLegacy, gradually increasing over time.

- An hourly cost of \$65 per hour per developer staff, with a 3% year-on-year inflation rate assumed.
- 80% productivity ratio, considering the proportion of developer time savings, going back into productive work.
- 65% of this benefit attributed to OpenLegacy, considering the specific capabilities in API development and automation.

Risks. This benefit considers the following risks and assumptions

- Estimations in rate of increase in SDK applications and API hours savings.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$690,291.

Cost Savings From Increased Developer Productivity And Faster Time-To-Market					
Ref.	Metric	Source	Year 1	Year 2	Year 3
C1	Number of applications	Customer	2,000	2,000	2,000
C2	Percentage of applications run on SDK	Customer	10%	15%	20%
C3	Applications to manage across distribution layer	C1*C2	200	300	400
C4	Hours taken per API before OpenLegacy	Customer	35	35	35
C5	Hours taken per API after OpenLegacy	Customer	5	5	5
C6	Average hourly rate for developer staff	Assumption	\$65	\$67	\$69
C7	Productivity ratio	Assumption	80%	80%	80%
C8	Attribution ratio	Assumption	65%	65%	65%
Ct	Cost savings from increased developer productivity and faster time-to-market	C3*(C4-C5)*C6*C7*C8	\$202,800	\$313,560	\$430,560
	Risk adjustment	↓10%			
Ctr	Cost savings from increased developer productivity and faster time-to-market (risk-adjusted)		\$182,520	\$282,204	\$387,504
Three-year total: \$852,228			Three-year present value: \$690,291		

INCREASED PRODUCTIVITY IN DEVSECOPS

Evidence and data. A key benefit the interviewed organization experienced with the efficiencies in CICS integration enabled by OpenLegacy was a strategic efficiency in developing their DevSecOps capabilities.

- Improving DevSecOps is a strategic priority for the interviewed customer, with their current capabilities based on a constant microservices architecture, CI/CD processes and testing tools.
- Developing a DevSecOps pipeline would have taken 10 FTEs without OpenLegacy. Now, with the standardization of processes, automation and ease of integrations, the resources required to develop the same pipeline has halved to 5 FTEs.
- This enabled an average \$576,968 in increased productivity and FTE cost savings over a three-year horizon for the interviewed customer.
- The productivity that OpenLegacy provides allowed the organization to build on required initiatives in DevSecOps, enabling the solution to contribute to the availability of time and effort for more strategic needs.

Modeling and assumptions. Calculations for this benefit considers the following assumptions.

- 80% productivity ratio, considering the proportion of developer time savings, going back into productive work.
- 70% of this benefit is attributed directly to OpenLegacy's solution, considering broader strategic processes and initiatives the interviewed customer would also be developing for DevSecOps.

Risks. This benefit considers the following risks.

- Assumptions and consistency in efforts for pipeline development
- Consistency in attribution to OpenLegacy solution.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$1,288,930.

Increased Productivity In DevSecOps

Ref.	Metric	Source	Year 1	Year 2	Year 3
D1	FTE effort required in DevSecOps pipeline without OpenLegacy	Customer	10	10	10
D2	FTEs required for current DevOps pipeline	Customer	5	5	5
D3	Average annual FTE cost	Assumption	\$200,000	\$206,000	\$212,180
D4	Productivity ratio	Assumption	80%	80%	80%
D5	Attribution ratio	Assumption	70%	70%	70%
Dt	Productivity savings in DevSecOps	$D3 \times (D1 - D2) \times D4 \times D5$	\$560,000	\$576,800	\$594,104
	Risk adjustment	↓ 10%			
Dtr	Productivity savings in DevSecOps (risk-adjusted)		\$504,000	\$519,120	\$534,694
Three-year total: \$1,557,814			Three-year present value: \$1,288,930		

UNQUANTIFIED BENEFITS

Additional benefits that the customer experienced but was not able to quantify include:

- **Standardization and automation of processes.** OpenLegacy enabled end-to-end automation flows, especially with respect to CICS transactions. Templated development models, API automation led to structures and processes the interviewed customer did not previously have with its ESB architecture. This standardization of processes provided a springboard for other more strategic processes to take place across the IT organization.
- **Visibility and monitoring of business flows.** The interviewed organization can now change and improve processes quickly and more effectively, with OpenLegacy's direct integrations to the mainframe.
- **Scalable and secure architecture.** Previous security levels for CICS, based on message queueing, were too low and not fit for future development needs. OpenLegacy capabilities allowed the interviewed customer to define a more scalable, flexible and secure architecture at a transaction level, helping to prevent any future issues in the CICS level.
- **Future-ready for digital innovation.** Cost savings incurred from improved API efficiency, developer time and integration expenses overall through OpenLegacy's direct integrations provided the interviewed organization the resources and the capabilities to allocate to strategic digital initiatives for the business. Improving legacy integrations thereby enabled IT architecture to be more future-ready for transformation needs.

FLEXIBILITY

The value of flexibility is unique to each customer. There are multiple scenarios in which a customer might implement OpenLegacy and later realize additional uses and business opportunities, including:

- **Developing beyond CICS transaction integrations.** The interviewed organization commented on the ability to easily spread knowledge and processes developed in the CICS level, to other legacy components of the IT architecture.
- **Further integration with core systems.** The interviewed customer also described further implementation for other core business processes and core systems.

Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in [Appendix A](#)).

Analysis Of Costs

■ Quantified cost data

Total Costs							
Ref.	Cost	Initial	Year 1	Year 2	Year 3	Total	Present Value
Etr	Implementation costs	\$57,500	\$517,500	\$569,250	\$626,175	\$1,770,425	\$1,468,864
Ftr	Internal labor effort cost	\$0	\$55,973	\$40,066	\$26,408	\$122,446	\$103,837
	Total costs (risk adjusted)	\$57,500	\$573,473	\$609,316	\$652,583	\$1,892,871	\$1,572,701

IMPLEMENTATION COSTS

Evidence and data. OpenLegacy implementation costs are dependent on the scope of modules, processes and integrations that are required for an organization.

- The interviewed organization had components that incurred an average cost of \$496,500 across a three-year horizon.
- Initial scope of assessment, time and resources incurred a \$50,000 cost.

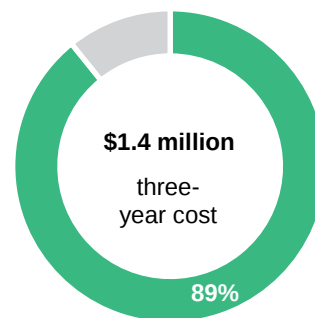
Modeling and assumptions. This cost calculation considers the following assumptions.

- An estimated 10% increase in scope of work and implementation, considering the customer's plans to increase and expand on OpenLegacy's integrations.

Risks. Potential risks that can impact this cost calculation include.

- Estimation of potential increase in scope over the three-year horizon.

Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of \$1,405,000.



Implementation Costs						
Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
E1	Implementation costs	Customer		\$450,000	\$495,000	\$544,500
Et	Implementation costs	E1	\$50,000	\$450,000	\$495,000	\$544,500
	Risk adjustment	↑10%				
Etr	Implementation costs (risk-adjusted)		\$55,000	\$495,000	\$544,500	\$598,950
Three-year total: \$1,693,450			Three-year present value: \$1,405,000			

INTERNAL LABOR AND EFFORT COSTS

Evidence and data. The interviewed organization indicated a team of internal staff were involved in the planning and execution of the OpenLegacy solution.

- The interviewed customer indicated up to 4 FTEs from their developer teams were involved in the set-up, ongoing management and expansion of the solution.
- This involves 2,704 FTE hours involved in implementation and management across a three-year horizon, incurring an average of \$59,557 in labor costs.

Modeling and assumptions. This cost calculation considers the following assumptions:

- Hourly cost of \$65 per hour per developer, with a year-on-year inflation of 3%.
- Average time of FTE attributed to working specifically on OpenLegacy's implementation and ongoing management is 20%, with gradual decrease over time.

Risks. Estimations in hourly costs and attribution of time and effort could incur potential risks that may impact this cost calculation.

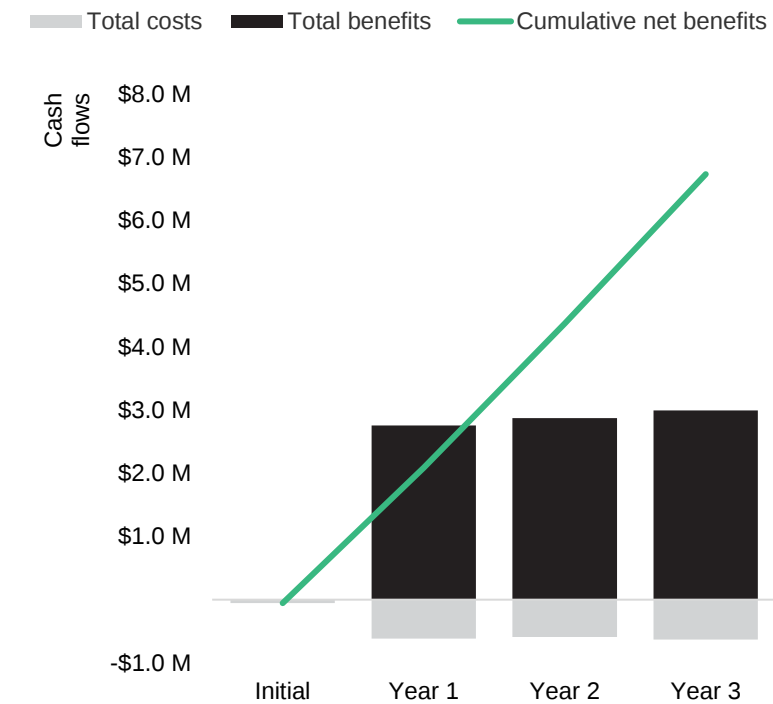
Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV of \$169,890.

Internal Labor Effort Costs						
Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
F1	Number of FTEs working on OpenLegacy implementation	Customer		4	3	2
F2	Average rate of working on OpenLegacy implementation	Assumption		20%	10%	10%
F3	Number of FTE hours spent on OpenLegacy implementation	$F1 \times F2 \times 2080$		1,664	624	416
F4	Average FTE hourly cost	Assumption		\$65	\$67	\$69
Ft	Internal labor effort cost	$F3 \times F4$	\$0	\$108,160	\$41,808	\$28,704
	Risk adjustment	↑10%				
Ftr	Internal labor effort cost (risk-adjusted)		\$0	\$118,976	\$45,989	\$31,574
Three-year total: \$196,539			Three-year present value: \$169,890			

Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)



The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the organization's investment. Forrester assumes a yearly discount rate of 10% for this analysis.

These risk-adjusted ROI, NPV, and payback period values are determined by applying risk-adjustment factors to the unadjusted results in each Benefit and Cost section.

Cash Flow Analysis (Risk-Adjusted Estimates)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total costs	(\$55,000)	(\$613,976)	(\$590,489)	(\$630,524)	(\$1,889,989)	(\$1,574,890)
Total benefits	\$0	\$2,757,308	\$2,872,112	\$2,992,985	\$8,622,405	\$7,128,963
Net benefits	(\$55,000)	\$2,143,332	\$2,281,623	\$2,362,461	\$6,732,415	\$5,554,073
ROI						353%
Payback						<6

Appendix A: Total Economic Impact

Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

TOTAL ECONOMIC IMPACT APPROACH

Benefits represent the value delivered to the business by the product. The TEI methodology places equal weight on the measure of benefits and the measure of costs, allowing for a full examination of the effect of the technology on the entire organization.

Costs consider all expenses necessary to deliver the proposed value, or benefits, of the product. The cost category within TEI captures incremental costs over the existing environment for ongoing costs associated with the solution.

Flexibility represents the strategic value that can be obtained for some future additional investment building on top of the initial investment already made. Having the ability to capture that benefit has a PV that can be estimated.

Risks measure the uncertainty of benefit and cost estimates given: 1) the likelihood that estimates will meet original projections and 2) the likelihood that estimates will be tracked over time. TEI risk factors are based on "triangular distribution."

The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1 that are not discounted. All other cash flows are discounted using the discount rate at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations in the summary tables are the sum of the initial investment and the discounted cash flows in each year. Sums and present value calculations of the Total Benefits, Total Costs, and Cash Flow tables may not exactly add up, as some rounding may occur.



PRESENT VALUE (PV)

The present or current value of (discounted) cost and benefit estimates given at an interest rate (the discount rate). The PV of costs and benefits feed into the total NPV of cash flows.



NET PRESENT VALUE (NPV)

The present or current value of (discounted) future net cash flows given an interest rate (the discount rate). A positive project NPV normally indicates that the investment should be made, unless other projects have higher NPVs.



RETURN ON INVESTMENT (ROI)

A project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits less costs) by costs.



DISCOUNT RATE

The interest rate used in cash flow analysis to take into account the time value of money. Organizations typically use discount rates between 8% and 16%.



PAYBACK PERIOD

The breakeven point for an investment. This is the point in time at which net benefits (benefits minus costs) equal initial investment or cost.

Appendix B: Endnotes

¹ Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders

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