A Forrester Total Economic Impact™
Study Commissioned By Amplience
April 2019

The Total Economic Impact™ Of Amplience's Dynamic Media Platform

Reduce Costs, Minimize Downtime, And Boost eCommerce Site Performance With The Dynamic Media Platform

FORRESTER®

Table Of Contents

Project Director:
Jan ten Sythoff

ABOUT FORRESTER CONSULTING

Forrester Consulting provides independent and objective research-based consulting to help leaders succeed in their organizations. Ranging in scope from a short strategy session to custom projects, Forrester's Consulting services connect you directly with research analysts who apply expert insight to your specific business challenges. For more information, visit forrester.com/consulting.

FORRESTER®

Executive Summary

Main Benefits

Licensing cost savings:
$744,275

Avoidance of outage revenue losses: $448,319

Improved performance:
Reduced time for media uploading

Amplience's Dynamic Media is a reliable and scalable platform for managing media assets for eCommerce businesses. The Amplience company commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) businesses may realize with Amplience's Dynamic Media platform. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Dynamic Media on their organizations.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed four customers with extensive experience using Amplience's Dynamic Media platform. Forrester aggregated the data gained from these interviews into a model or composite organization, around which a three-year financial model was built.

By using Amplience's platform, the interviewed eCommerce organizations were able to reliably, cost-effectively, and efficiently render images and videos across multiple digital channels.

For the interviewed retailers with large, multibillion-dollar eCommerce sites, Amplience's solution performs better and offers significant cost savings over their legacy rich media platforms. For retailers upgrading their web presences to enable eCommerce, Amplience's Dynamic Media platform ensures a high-quality customer experience and offers cost effectiveness and efficiency.

Key Findings

Quantified benefits. The following risk-adjusted present value (PV) quantified benefits are representative of those experienced by the companies interviewed. Based on the results they obtained, we have estimated the likely financial impact on the composite organization described in this case study, a large retailer with revenues of $3 billion, with 30% of its business online with a legacy rich media platform.

› **The biggest benefit is the license fee savings achieved by replacing the legacy media platform.** Amplience uses the latest storage and content delivery network (CDN) technologies, enabling it to provide savings of 25% to 30% compared to legacy media platforms. The composite organization saved a risk-adjusted PV of $744,275 over three years.

› **The other significant benefit is the avoidance of revenue losses from system outages.** The Amplience platform is highly scalable and highly reliable, with over 99.99% monthly uptime. The composite thus avoided 2 hours of site downtime per year. This revenue loss avoidance, after a risk adjustment of 20%, amounted to $448,319 over the three years.

› **Maintenance costs are half of the legacy platform.** The maintenance effort required for the Amplience platform was just two man-days per month; the composite's legacy platform required double that amount. This resulted in cost savings of $42,973, on a three-year, present value, risk-adjusted basis.

Unquantified benefits. The interviewed organizations experienced the following benefits, which have not been quantified for this study:

ROI
66%

Benefits PV
$1,235,567

Net PV
$492,987

Payback
5.5 months

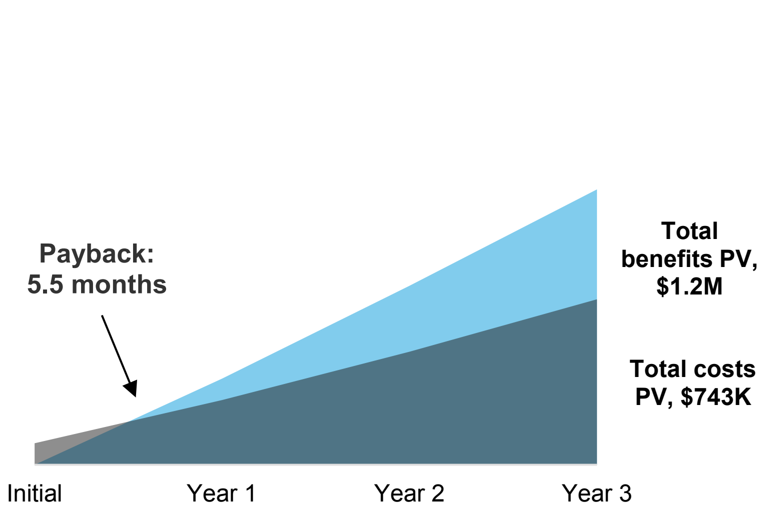
- **Faster media delivery.** All four customers noted that the Amplience Dynamic Media platform provides very high performance, notably minimizing the media download time, improving the customer experience, and resulting in high conversion and customer loyalty rates.
- **Improved support.** All interviewed customers also said that Amplience provides responsive and high-quality support. It worked with clients to improve the performance of the platform and in some cases also partnered with clients to develop new capabilities such as augmented reality.

Costs. The interviewed organizations experienced the following risk-adjusted PV costs, modeled for the composite organization:

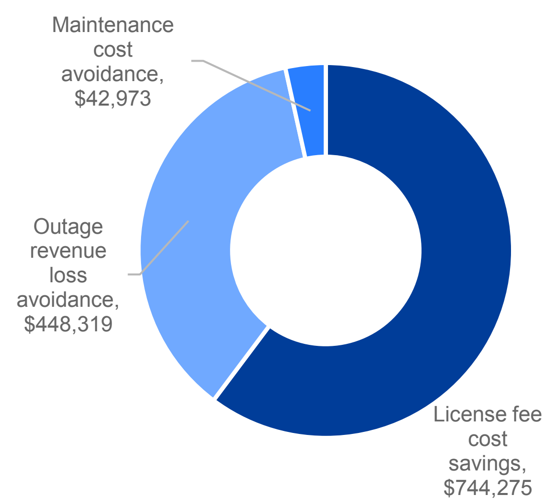
- **Access to the platform and service make up 83% of total costs.** The biggest cost element is Amplience's fees for use of the platform. Its fees are based on the volume of site visits; for the composite organization, the fee grew from $200,000 in the first year to $300,000 in the third as it attracted more customers and repeat visits. The three-year risk adjusted present value of the platform access costs for the composite organization came to $613,824.
- **Planning and implementation costs accounted for 13% of the total costs.** Planning took around eight weeks and 45 man-days of effort for the composite; implementation then took 12 weeks and 120 man-days of effort, with some development work required across the different digital channels. Following a risk adjustment of 20%, this resulted in an upfront cost of $96,525.
- **Platform maintenance accounted for the remaining 4% of total costs**. Two man-days per month were required to maintain the platform, equating to a three-year risk adjusted present value of $32,230.

Forrester's interviews with four existing customers and subsequent financial analysis found that the resulting composite organization experienced benefits of $1,235,567 over three years versus costs of $742,579, adding up to a net present value (NPV) of $492,988 and an ROI of 66%.

Financial Summary



Three-Year Present Value Benefits



FORRESTER®

TEI Framework and Methodology

Forrester has constructed a Total Economic Impact™ (TEI) framework for organizations considering adopting Amplience's Dynamic Media platform.

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 Amplience's Dynamic Media platform can have on an organization:

The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

DUE DILIGENCE
Interviewed Amplience stakeholders and Forrester analysts to gather data relative to Amplience's Dynamic Media solution.

CUSTOMER INTERVIEWS
Interviewed four organizations using Amplience's Dynamic Media platform to obtain data with respect to costs, benefits, and risks.

COMPOSITE ORGANIZATION
Designed a composite organization based on characteristics of the interviewed organizations.

FINANCIAL MODEL FRAMEWORK
Constructed a financial model representative of the interviews using the TEI methodology and risk-adjusted the financial model based on issues and concerns of the interviewed organizations.

CASE STUDY
Employed three fundamental elements of TEI in modeling Amplience's Dynamic Media impact: benefits, costs, and risks. Given the increasing sophistication that enterprises have regarding ROI analyses related to IT investments, Forrester's TEI methodology serves to provide a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

DISCLOSURES

Readers should be aware of the following:

This study is commissioned by Amplience 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 report to determine the appropriateness of an investment in Amplience's Dynamic Media.

Amplience 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.

Amplience provided the customer names for the interviews but did not participate in the interviews.

The Amplience Dynamic Media Customer Journey

BEFORE AND AFTER THE INVESTMENT IN AMPLIENCE

Interviewed Organizations

For this study, Forrester conducted four interviews with Amplience Dynamic Media customers. The interviewed customers include the following:

INDUSTRY	REGION	INTERVIEWEE	REVENUES
Multibrand eCommerce retailer	Europe	Department head of technical product development	$16.0 billion
Catalog retailer	Europe	Head of customer experience, digital channels	$5.4 billion
Furniture retailer	Europe	Head of online	$1.1 billion
Sports goods retailer	US	Director, web operations	$1.0 billion

Key Challenges

Interviewed customers faced several challenges that led to their investment in Amplience's Dynamic Media platform. Customers can be broken down into the larger eCommerce retailers that already had invested into legacy rich media platforms and smaller retailers wanting to build a transactional web presence.

Key challenges for large retailers included:

› **Maintaining an expensive legacy infrastructure.** The media platforms that had been in use for several years were costly, both in terms of the platform access costs and the maintenance and support required.

› **Outmoded systems that could no longer support growing online commerce requirements.** Not only does online commerce continue to grow, but the requirements also change, particularly with the growing importance of mobile channels. Scalability and reliability became increasing issues for the retailers. At the same time, the need to support multiple digital channels was resulting in bottlenecks and inefficiencies.

Key challenges for the smaller retailers were to:

› **Develop a high-performance eCommerce presence.** These retailers needed to be able to easily support multiple online channels and ensure a good customer experience.

› **Ensure the platform was cost-effective and efficient.** The retailers wanted to ensure that they could manage their digital media assets effectively and efficiently.

"The cost [of the old system] was high, as were the servicing costs."

Head of customer experience, digital channels, catalog retailer

Key Results

The interviews revealed that key results from the Amplience Dynamic Media investment include:

- **Reduced licensing costs.** The two large online retailers reported a significant reduction in license access costs, typically of 30% or more. Because Amplience uses cloud-based storage and load-balanced CDN, its costs are lower than competing media platform providers, yet it provides superior capabilities.
- **Improved customer experience.** All the customers reported that the Amplience platform is able to dynamically render media quickly, which is essential for a successful eCommerce business. If customers have to wait too long for images, videos, or promotions to load, they quickly look elsewhere, resulting in lost traffic, lower conversions, and fewer repeat visits.
- **Reduced outages and associated revenue loss.** One of the large online retailers reported regular outages with its legacy solution, resulting in loss of online revenue. The other reported that because the volume of media assets it was using was growing so fast, the previous system would not have been able to continue reliably. The Amplience Dynamic Media platform provides for very high reliability and scalability, with no maintenance outages and high performance even during busy sales periods.
- **Reduced maintenance and support costs.** All the customers reported a high level of support from Amplience. The interviewees at the two larger retailers told us that their monthly maintenance and support costs had decreased following their move to Amplience.

"The Amplience licensing price is about 30% lower than what we were paying before."

Department head of technical product development, multibrand eCommerce retailer

Composite Organization

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas financially affected. The composite organization is representative of the four companies that Forrester interviewed, with an emphasis on the two larger online retailers; it is used to present the aggregate financial analysis in the next section. The composite organization that Forrester synthesized from the customer interviews has the following characteristics:

It is a large regional retailer with an established consumer eCommerce presence accounting for 30% of its $3 billion in sales. The site includes online, mobile, and in-store channels, with around 50 million visits per month, and it supports media assets of around a million images, videos, PDFs, and other promotional materials. It has 12,000 employees and an IT/web team of 30 members.

The organization had been using an older rich media legacy system for several years, which needed to be upgraded because of high licensing fees and costly maintenance. Furthermore, with strong online growth, the organization was looking for a platform that could scale reliably, provide very high performance, and take advantage of emerging digital channel capabilities.

The composite:

- Employs 12,000 FTEs
- Conducts 30% of its $3 billion in sales online
- Manages 1 million media assets
- Attracts 50 million online site visits per month

Analysis Of Benefits

QUANTIFIED BENEFIT DATA AS APPLIED TO THE COMPOSITE

Total Benefits

REF.	BENEFIT	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Atr	License fee cost savings	$243,000	$306,000	$360,000	$909,000	$744,275
Btr	Outage revenue loss avoidance	$164,384	$180,822	$198,904	$544,110	$448,319
Ctr	Maintenance cost avoidance	$17,280	$17,280	$17,280	$51,840	$42,973
	Total benefits (risk-adjusted)	$424,664	$504,102	$576,184	$1,504,950	$1,235,567

Benefit 1: Licensing Fee Cost Savings

The biggest benefit experienced by customers that moved from a legacy environment to Amplience Dynamic Media was the savings in licensing costs. They reported that the access to the Amplience platform typically costed them 25% to 30% less than the alternative, resulting in huge savings. Because Amplience uses the latest storage and content delivery technologies, it can offer competitive pricing while also providing high performance and reliability.

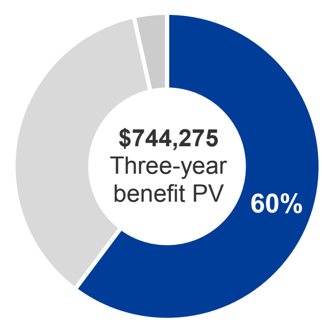
In estimating the licensing cost fee savings for the composite organization, Forrester assumed that:

- The volume of website visits of the composite was around 50 million per month and growing by 20% to 25% annually. This resulted in Amplience licensing costs of $200,000 in Year 1, $250,000 in Year 2, and $300,000 in Year 3.
- The equivalent cost of continuing to use the legacy platform would have been around 25% higher.

As a result, the licensing fee cost savings were estimated at $270,000 in the first year, growing to $400,000 in the third.

Forrester applied a risk adjustment of 10% due to some uncertainty in the difference between the legacy and Amplience licensing costs. The cost savings amounted to $243,000 in Year 1, $306,000 in Year 2, and $360,000 in Year 3. Over the three-year period, this resulted in a risk-adjusted present value of $744,275.

The table above shows the total of all benefits across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total benefits to be a PV of $1,235,567.



License fee cost savings — **60%** of total benefits

Benefit 1: Licensing Fee Cost Savings: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
A1	License fee avoidance		$270,000	$340,000	$400,000
At	License fee cost savings		$270,000	$340,000	$400,000
	Risk adjustment	↓10%			
Atr	License fee cost savings (risk-adjusted)		$243,000	$306,000	$360,000

FORRESTER®

Benefit 2: Outage Revenue Loss Avoidance

All four customers highlighted the stability and reliability of the Amplience platform as a key benefit. One large customer reported that it lost up to 10 hours of online trading revenue per year because of both planned and unplanned outages. Another said that the legacy solution would not have been able to cope with the growth in the popularity of the site and the increase in the number of media assets it was managing. All customers reported that the Amplience solution provided a very stable, reliable, and scalable platform for the delivery of media assets.

Impact risk describes the risk of an organizations' business or technology requirements exceeding the investment, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for benefit estimates.

For the composite organization, Forrester assumed that:

- Two hours of annual outages were avoided by moving from the legacy platform to Amplience.
- The outage revenue per hour equaled the average hourly online revenue.
- Annual online revenues were growing by 10%.

As a result, the composite avoided outage revenue losses of $205,479 in Year 1, $226,027 in Year 2, and $248,630 in Year 3.

"Previously there were planned maintenance works, which overlapped with our business hours. Furthermore, once per quarter, there was a 30- to 120-minute outage."

Head of customer experience, digital channels, catalog retailer

The outage revenue loss avoidance will vary with:

- The difference in outage time between the legacy and Amplience platforms.
- The timing of the outages. While the average hourly online revenue has been used to calculate the loss avoided, it is most important to avoid outages at very busy selling times.

To account for these risks, Forrester adjusted this benefit downward by 20%, yielding a three-year risk-adjusted total PV of $448,319.

Benefit 2: Outage Revenue Loss Avoidance: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
B1	Annual outage time avoided (hours/year)		2	2	2
B2	Annual online revenue		$900,000,000	$990,000,000	$1,089,000,000
B3	Average hourly online revenue (rounded value shown)	B2/365/24	$102,740	$113,014	$124,315
Bt	Outage revenue loss avoidance	B3*B1	$205,479	$226,027	$248,630
	Risk adjustment	↓20%			
Btr	Outage revenue loss avoidance (risk-adjusted)		$164,384	$180,822	$198,904

Benefit 3: Maintenance Cost Avoidance

Customers reported that the maintenance of their legacy platforms required typically around four man-days per month. Moving to the Amplience platform reduced these to just two man-days per month.

For the composite organization, Forrester assumed that:

- Two days per month were required to maintain the Amplience platform.
- IT engineers earned a salary of $100,000, roughly equivalent to a daily rate of $450.

The amount of maintenance cost savings will vary with:

- Differences in how the platform is implemented and integrated.

To account for these risks, Forrester adjusted this benefit downward by 20%, yielding a three-year risk-adjusted total PV of $42,973.

Benefit 3: Maintenance Cost Avoidance: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
C1	Maintenance time avoided (days/month)		4	4	4
C2	Average hourly rate		$450	$450	$450
Ct	Maintenance cost avoidance	C1*12*C2	$21,600	$21,600	$21,600
	Risk adjustment	↓20%			
Ctr	Maintenance cost avoidance (risk-adjusted)		$17,280	$17,280	$17,280

Unquantified Benefits

The customers with which Forrester spoke highlighted a number of additional benefits but were not able to provide sufficient metrics to quantify them. There were three key additional benefits:

- **Fast media delivery times.** Customers reported high performance from the solution, resulting in fast media delivery times. If an image or video is slow to load, online shoppers will quickly go elsewhere. The platform is able to dynamically manipulate an image, thus delivering, for instance, a lower resolution version to mobile apps for faster load times; in the case of luxury goods, it delivers very high-quality images with "super-zoom" capability. By ensuring a good customer experience, even during very busy sales periods, customer metrics such as conversion rates, repeat visits, and order sizes are maximized.

- **High level of Amplience support.** Another benefit that all the customers highlighted was the high level of support that Amplience provides. The legacy providers were slow to respond and would charge heavily for additional requests, while Amplience is communicative and responsive. Good support also encompasses sharing experiences and trends from other customers and being open to developing new capabilities. One customer worked with Amplience to support augmented reality capabilities into its mobile apps.

- **Increased efficiency.** The composite organization migrated a legacy rich media platform with the Amplience solution. However, in cases in which there is no prior solution, a significant improvement in efficiency is the key benefit. In the case of the furniture retailer with which Forrester spoke, half of the team of 16 developers saved 30% of their time, equivalent to over 500 man-days per year. The retailer was able to use this time to further reduce media download times, in turn improving conversion rates by 15%.

> "The images load faster and are of better quality, which does have an impact on customer metrics such as conversion rates and loyalty, but it's difficult to measure the actual impact."
>
> *Head of customer experience, digital channels, catalog retailer*

> "Amplience provides better and more reactive support."
>
> *Department head of technical product development, multibrand eCommerce retailer*

Analysis Of Costs

QUANTIFIED COST DATA AS APPLIED TO THE COMPOSITE

Total Costs

REF.	COST	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Dtr	Licensing costs	$0	$200,000	$250,000	$300,000	$750,000	$613,824
Etr	Planning and implementation costs	$96,525	$0	$0	$0	$96,525	$96,525
Ftr	Maintenance costs	$0	$12,960	$12,960	$12,960	$38,880	$32,230
	Total costs (risk-adjusted)	$96,525	$212,960	$262,960	$312,960	$885,405	$742,579

Cost 1: Licensing Costs

The table above shows the total of all costs across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total costs to be a PV of $742,579.

The most significant cost of using Amplience's Dynamic Media is the licensing costs or the annual subscription for use of the platform. The licensing cost is based on the total number of website visits and therefore increases with the growth in the popularity of the customer's digital channels.

The composite organization received around 50 million visits to its sites per month, equating to a licensing fee of $200,000. With the number of visits increasing month on month, the annual costs also grew, increasing to $250,000 in the second year and $300,000 in the third.

Forrester did not apply a risk adjustment, as Amplience provided the license costs; the present value of platform and service costs over three years was $613,824. This is equivalent to 83% of the total three-year present value risk-adjusted costs.

Cost 1: Licensing Costs: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
D1	Platform and service costs			$200,000	$250,000	$300,000
Dt	Licensing costs	D1		$200,000	$250,000	$300,000
	Risk adjustment	0%				
Dtr	Licensing costs (risk-adjusted)		$0	$200,000	$250,000	$300,000

Cost 2: Planning And Implementation Costs

Organizations incur significant planning and implementation costs associated with upgrading the digital asset management element of their eCommerce systems. Planning includes preparations, proof of concept, and putting together a clear implementation plan to ensure minimal disruptions. It excludes any time required for vendor selection. Implementation also requires significant resources for moving mobile apps, in-store channels, and the website over to the new platform.

For the composite organization, Forrester assumed that:

- The planning phase required 45 man-days of effort. It took roughly eight weeks, with three FTEs working on it for around two days per week each.
- Implementation required 120 man-days of effort. With a team of five FTEs each putting in two to three days per week, the implementation took 10 weeks.
- The average daily rate was $450, equivalent to a salary of roughly $100,000.

As a result, the total financial upfront cost amounted to $74,250. Forrester risk-adjusted this by 30%, given that different organizations will be set up in different ways and will have different in-house capabilities; this resulted a three-year risk-adjusted present value of $96,525.

Cost 2: Planning And Implementation Costs: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
E1	Planning time (man-days)		45	0	0	0
E2	Implementation time (man-days)		120	0	0	0
E3	Average daily rate		$450	$0	$0	$0
Et	Planning and implementation costs	(E1+E2)*E3	$74,250	$0	$0	$0
	Risk adjustment	↑30%				
Etr	Planning and implementation costs (risk-adjusted)		$96,525	$0	$0	$0

Cost 3: Maintenance Costs

Supporting the Amplience platform requires a small amount of maintenance effort. For the composite, this amounted to two man-days of effort per month. At a daily rate of $450 (approximately equivalent to a salary of $100,000), the annual cost was $10,800. The cost of maintaining the legacy platform was double this amount.

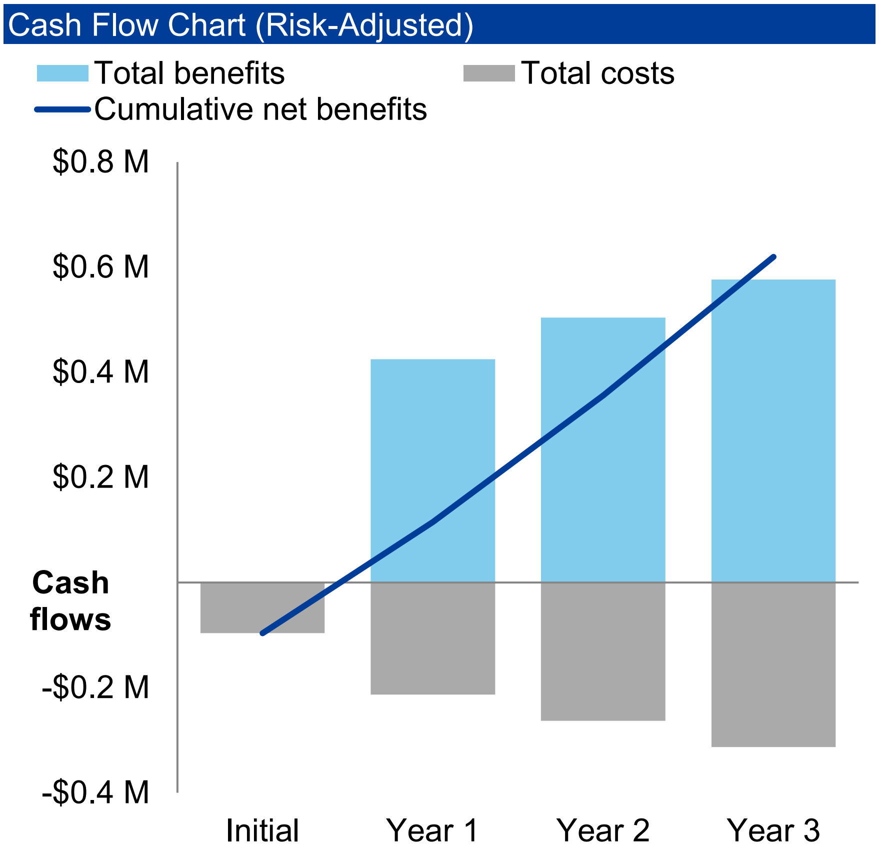
Forrester risk-adjusted this down by 20% to account for any additional maintenance requirements for different implementations, resulting in risk-adjusted annual maintenance costs of $12,960.

Cost 3: Maintenance Costs: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
F1	Maintenance requirement (days/month)		0	2	2	2
F2	Average daily rate		$450	$450	$450	$450
Ft	Maintenance costs	F1*F2*12	$0	$10,800	$10,800	$10,800
	Risk adjustment	↑20%				
Ftr	Maintenance costs (risk-adjusted)		$0	$12,960	$12,960	$12,960

Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS



The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the composite 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 Table (Risk-Adjusted)

	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Total costs	($96,525)	($212,960)	($262,960)	($312,960)	($885,405)	($742,579)
Total benefits	$0	$424,664	$504,102	$576,184	$1,504,950	$1,235,567
Net benefits	($96,525)	$211,704	$241,142	$263,224	$619,545	$492,987
ROI						66%
Payback period						<6 months

FORRESTER®

Amplience’s Dynamic Media: Overview

The following information is provided by Amplience. Forrester has not validated any claims and does not endorse Amplience or its offerings.

Amplience helps our customers to tell more powerful stories. Stories about their brand, their products and services, and ultimately stories that put customers at the center of their own personalized narrative.

Amplience Dynamic Media provides organizations:

- Complete control over their digital visual content, such as product images and videos as well as promotional content like dynamic banners, look books and shoppable videos.
- Powerful automated image and video management workflows, dynamic imaging and video transcoding capabilities, metadata and media viewer configuration.
- A suite of tools that helps store, structure, manage and publish large volumes of digital assets.
- A load-balanced CDN infrastructure that accelerates media delivery to load pages faster than ever before.
- Expert support and on-going education from our leading customer success team.

Amplience works with over 300 brands worldwide in digital commerce, B2B, branded manufacturing and consumer packaged goods industries.

Ends.

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.