FORRESTER®

The Total Economic Impact™ Of Lightbend Akka Platform

Cost Savings And Business Benefits
Enabled By Lightbend Akka Platform

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Executive Summary

Competing in today's enterprise development space means being able to reliably meet the needs of millions of users across even more devices. A 2019 Forrester research report notes that in a world of connected web of services, customers expect "always-on capabilities, limitless capacity, and resilience in the face of occasional lapses in availability."[1] These changes in demands and expectations require companies to approach enterprise-level application development differently.

To gain competitive advantage, companies are expected to innovate in shorter cycles and quickly scale their applications while remaining flexible and nimble in response to changing business needs. Forrester analyst Mike Gualtieri said "the next frontier of competitive advantage is the speed with which you can extract value from data."[2]

Akka Platform from Lightbend helps accelerate that journey to having real-time enterprise data by simplifying the development, deployment, and operations of complex, multicomponent streaming-data pipelines.

Lightbend commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying Akka Platform. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Akka Platform on their organizations.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed decision-makers from five organizations with experience using Akka Platform. For the purposes of this study, Forrester aggregated the experiences of the interviewed customers and combined the results into a single composite organization.

Customers use Akka Platform to build their most critical business applications. This can mean different things to different companies, but the common thread is that any potential disruption to these applications can have a significant negative impact. Thus, the

KEY STATISTICS

Return on investment (ROI)
139%

Net present value (NPV)
$5.05M

interviewees' companies wanted a solution that can build reliable, high-performing, scalable applications.

Prior to using Akka Platform, the customers used a variety of solutions to build their most business-critical applications. Some of the organizations used monolithic systems on-premises or in the cloud, while others outsourced certain functions to externally managed service partners. These methods had challenges that left the organizations with accumulations of technical debt that could not keep up with the growing demands of their businesses. Some of the organizations had been using the same legacy technology for many years, if not decades. These limitations led to various throughput and performance issues that resulted in more frequent and longer server downtimes and system outages, as well as challenges in scaling their solutions.

By investing in Akka Platform, these organizations are now adopting application development infrastructure based on microservices and reactive architecture principles. A microservice is "a software

component that does one thing well, is self-contained, and communicates with other microservices through APIs or messages independent of the specific programming language."[3] Organizations can then develop, deploy, and scale these small, discrete components independently. Each component is easy to change, which means there is potential for more frequent deployments. Microservices can also make application development more scalable and more reliable if an organization is having performance scaling issues.

The interviewees' organizations now capture

> **"Being able to model these complex systems and build them, test them, and deploy them in a way that is reliable delivers a lot of value"**
> *– Cloud platform manager, consumer electronics*

incremental revenues they otherwise would have missed, they release applications to market faster, and they realize efficiencies from both their developers and infrastructure footprints. By extension, more reliable business performance leads to more engaged customers and more satisfied employees. Furthermore, having the ability to rapidly adapt means organizations are better prepared to respond to unexpected business changes, such as those caused by the COVID-19 pandemic.

KEY FINDINGS

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

- **Capturing 5% of incremental gross revenue annually.** Interviewees noted that having a more

reliable application development system without downtime or outages directly translated to additional revenue that their organizations were able to capture. The microservice model of Akka allowed the organizations to isolate potential issues in their application development infrastructures and prevent them from impacting larger systems.

- **Releasing new applications to market 50% to 75% faster.** Switching to Akka Platform let the organizations release new applications to market much more quickly. This allowed them to realize the benefits from those applications (e.g., revenue generation, operational efficiency) much faster. Interviewees said the platform's architecture containerization and having the ability to replicate that model in other parts of the system are key t speeding up their time-to-market.

- **Enabling developers to be twice as productive using Akka Platform for their application development work.** Interviewees said building applications using microservices and reactive architecture helped developers. Microservices enabled them to focus on their domain's business logic without being distracted by other concerns. As a result, each team could deploy whenever they were ready. This can lead to more rapid and frequent deployments along with increased developer productivity and efficiency.

- **Significantly cutting infrastructure footprints, which reduces total spend by two to three times.** Akka Platform allowed the interviewees' organizations to do more with less by giving them the ability to consolidate multiple databases into one. In fact, using one database can serve more users than the multiple databases in the organizations' prior environments. Interviewees said applications built on Akka Platform systems

can do a lot with very little compute and very little database storage.

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

- **Improved customer experience.** As the interviewees' organizations were able to create better applications using Akka Platform, they were also able to improve the experience of their customers. Improved system performance and additional time from operating more efficiently meant the organizations opened up more time and resources to focus on their customer experiences.

- **Increased employee satisfaction and closer collaboration.** Interviewees said their companies' developers and internal employees enjoy the experience of using the microservices architecture of the Akka Platform because it allows them to focus more on specific areas of the application while also encouraging closer collaboration between team members.

- **Benefits from open-source technology and a sense of community.** Interviewees said the fact that Akka Platform has several features available as open source and has a community of users around it is validation of the technology. They said their organizations were more willing to take a risk knowing they could review the materials available, discuss the technology with other users who have used it, or even try the technology themselves.

Costs. Risk-adjusted PV costs include:

- **Akka Platform subscription.** Organizations start with the "development" subscription during the implementation and development cycle. Once in production, the Akka Platform "production" subscription is based on the footprint of the deployed application, which varies based on the application itself. Organizations can also add embedded Lightbend engineers (ELEs) to help solidify the use case of their subscription and maximize their benefits.

- **Internal cost.** The composite organization allocates five full-time employees to be involved in the development cycle of Akka Platform. Once in production, the organization allocates one full-time employee per application, spending 25% of their time on maintenance and management of the system.

The customer interviews and financial analysis found that a composite organization experiences benefits of $8.67 million over three years versus costs of $3.62 million, adding up to a net present value (NPV) of $5.05 million and an ROI of 139%.
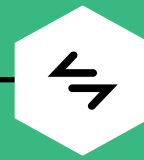
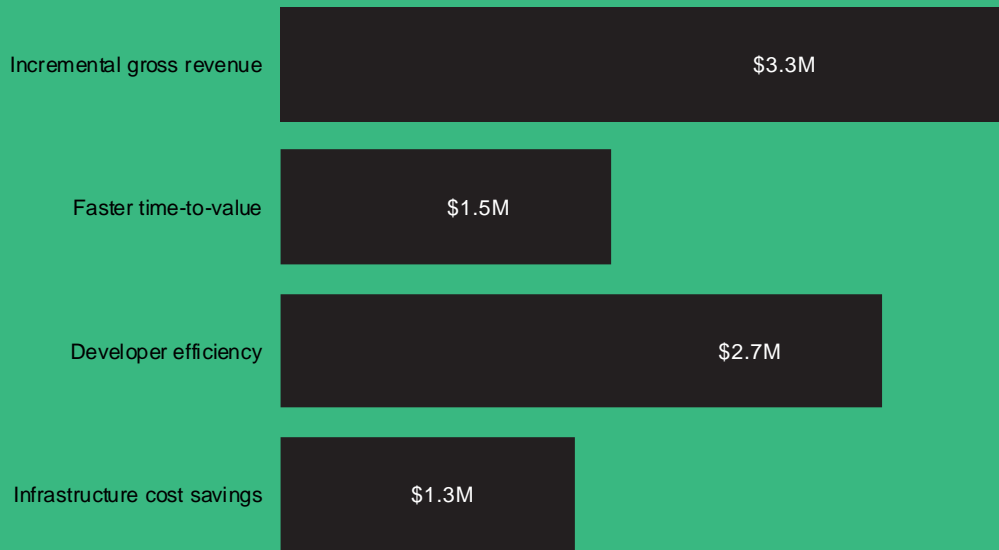| ROI	BENEFITS PV	NPV	PAYBACK
139%	**$8.67M**	**$5.05M**	**<6 months**

Benefits (Three-Year)

Incremental gross revenue	$3.3M
Faster time-to-value	$1.5M
Developer efficiency	$2.7M
Infrastructure cost savings	$1.3M

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 Lightbend Akka 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 Akka Platform can have on an organization.

DISCLOSURES

Readers should be aware of the following:

This study is commissioned by Lightbend 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 the Lightbend.

Lightbend 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.

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

DUE DILIGENCE
Interviewed Lightbend stakeholders and Forrester analysts to gather data relative to Akka Platform.

CUSTOMER INTERVIEWS
Interviewed seven decision-makers at five organizations using Akka 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 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.

Lightbend Akka Platform Customer Journey

■ Drivers leading to Lightbend Akka Platform investment

Interviewed Organizations			
Industry	**Region**	**Interviewee**	**Employees**
Consumer electronics	Global	Cloud platform manager	200 total employees, 20 regular Lightbend users
Insurance	Global	IT director Staff engineer	36,000 total employees, 18 to 25 regular Lightbend users
Financial services	North America	Business unit head Software engineer	1,000 total employees, 48 regular Lightbend users
Energy	North America	Senior director of engineering	100 total employees, 20 to 30 regular Lightbend users
Entertainment	Global	CTO	200 total employees, 18 to 24 regular Lightbend users

KEY CHALLENGES

Organizations use Akka Platform to develop their most critical and complex business applications. This can mean: building the infrastructure for a company's entire mobile-based payment, reward, and ordering application; producing real-time analytics to speed up risk assessment of potential customers; and generating visibility via a digital twin of a company's entire set of assets on the field. Any disruption to these use cases can lead to lost revenue, extended time, and wasted resources. That is why these applications require the best solutions available.

As the definition of "critical business application" differs from one organization to another, the interviewees' organizations were using different and wide-ranging types of platforms, tools, and technologies to build those applications prior to using Akka Platform. Some used legacy on-premises application architecture with monthly release cycles and monolithic applications. Others used a combination of hypertext preprocessor (PHP) or MySQL to build their own servers that contained everything that supports their business. Some organizations decided to outsource this work to externally managed service partners.

Nonetheless, the pain points were uniform and overarching. Interviewees said their solutions could no longer meet the demand of business growth and they were becoming a burden to maintain. This was especially true for organizations that had not modernized their legacy platform for years or decades. They built up so much technical debt that it significantly burdened their application development processes.

The interviewed organizations struggled with common challenges, including:

- **Legacy tools were no longer up to par in meeting the expected performance the business required.** Interviewees said their legacy application development tools had constant throughput and capacity issues. Some of the organizations had the same technology for decades and were in dire need of modernization. As older technologies required more attention for maintenance, employees were forced to spend a significant portion of their time on less-productive tasks. A business unit head with a financial services organization said: "Our team had highly educated and knowledgeable people, and we wanted them to spend as much time on more productive work. However, without the right

infrastructure, they were spending a disproportionate amount of time on just moving data around."

- **Increasing complexity of modern, cloud-native technology made scaling without the appropriate platform prone to system failure.** As the organizations continued to innovate and introduce new updates to their products, having unified monolithic application development systems became a burden. Maintaining their legacy applications was increasingly cost prohibitive and not scalable and making even the smallest change to some part of the application could break other parts of the system. A senior director of engineering with an energy organization said: "As the company grew and we started to scale, the classic problem of the monolith was everybody started stepping on each other's toes. If you change some part of the application, another part will blow up."

- **Efforts to overcome the challenges with legacy solutions were often quick fixes that allowed the same issues to rapidly emerge again.** To address the need for scalability, some of the organizations reverted to cloning their systems, but the clones were expensive to maintain, they took a long time to set up, and they quickly had the same issues down the line. An IT director with an insurance organization said: "It was very difficult to maintain the system, as it was not something that we could easily scale. It took us years to even clone our original database to the scale we needed."

SOLUTION REQUIREMENTS/INVESTMENT OBJECTIVES

The interviewed organizations decided that Akka Platform was the right solution for them because it:

- Has the ability to build and operate scalable and highly concurrent systems that meet the

performance expectation for all business-critical applications.

- Has the maturity and experience of operating under a microservices framework, which allows containerization and system independence in the platform that can support multiple teams.

- Has the flexibility and integration capabilities for organizations to adjust to whatever architecture mental model decision-makers wish to adopt.

- Generates large-scale and real-time analytics and calculations that organizations can use to further improve their applications.

- Provides an open-source framework that allows visibility for organizations to follow along.

COMPOSITE ORGANIZATION

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an ROI analysis that illustrates the areas financially affected. The composite organization is representative of the five companies that Forrester interviewed and is used to present the aggregate financial analysis in the next section. The composite organization has the following characteristics:

Description of composite. The composite organization generates $1 billion in annual revenue and has 1,500 employees worldwide. The company uses Akka Platform to build and run four business-critical applications over three years with varying production-release schedules. The company initially has 10 regular Akka Platform users, but that number gradually grows to 20 as the use case expands to new applications.

Deployment characteristics. The composite organization migrates to Lightbend's Akka Platform from a cloud-based legacy environment that was in place for years and required modernization. The adoption of Akka Platform is gradual, and it starts with building two applications (one revenue-generating application and one back-end application) on Akka Platform in Year 1, and then one application each in years 2 and 3.

Key assumptions

- **$1 billion in annual revenue**
- **1,500 total employees**
- **10 to 20 regular Lightbend users**
- **Uses Lightbend to build and run 2 to 4 business-critical applications with varying production release schedules and impact to the organization**

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	Incremental gross revenue	$800,000	$1,600,000	$1,600,000	$4,000,000	$3,251,690
Btr	Faster time-to-value	$850,000	$850,000	$0	$1,700,000	$1,475,207
Ctr	Developer efficiency	$720,000	$1,080,000	$1,440,000	$3,240,000	$2,629,001
Dtr	Infrastructure cost savings	$360,000	$540,000	$720,000	$1,620,000	$1,314,500
	Total benefits (risk-adjusted)	$2,730,000	$4,070,000	$3,760,000	$10,560,000	$8,670,398

INCREMENTAL GROSS REVENUE

Evidence and data. Investing in an Akka Platform subscription allowed the interviewees' organizations to have much more reliable application development systems. Interviewees said that switching to Akka Platform and using the surrounding support of their subscriptions gave their organizations performance and capabilities that were not possible with their prior solutions. These interviewees said using microservices and reactive architecture allowed their organizations to isolate potential errors and incidents and ensured that any error did not spread throughout the system. This produced more reliable overall system performance.

This stronger performance and new capabilities led to better business results, as the organizations no longer had as many system outages as they did before or were able to decrease the number of server downtime incidents or faulty applications. Some interviewed customers were even able to directly correlate their new system's improved performance with revenue they would not have realized had they not made the switch to Akka Platform.

- A number of interviewees noted that their organization's business model simply required

the best microservices and reactive architecture available, and they wanted device systems that could operate independently from one another. The cloud platform manager said, "Understanding that our business model relies on each system being independent, we felt confident with Lightbend — which has proven to have the maturity and know-how of this microservices and reactive space."

- Even for organizations that used Akka Platform for a specific use case (as opposed to using it as the overall backbone of their business model), the switch led to incremental gross revenue gains. A CTO with an entertainment organization said: "With the reduction in the number of outages we experienced with the system since working with Akka Platform, we were able to attribute 5% of our revenue to the fact that we now have a better-performing system with fewer outages and [less] downtime." That is 5% of revenue the organization would not have otherwise realized if it had problematic systems.

- Some interviewees noted that Akka Platform essentially created a new business for their organization. The business unit head in the financial services industry said: "The new system

allows us to do much faster real-time calculations which, in turn, allows [us] to do monthly analytics as opposed to bimonthly or quarterly analytics." This translated to increased visibility into improvements the organization could make.

Modeling and assumptions. For the composite organization, Forrester assumes that:

- The composite organization builds one revenue-generating application in Year 1, and a second revenue-generating application in Year 2. This means the composite organization will have one revenue-generating application in Year 1 and two revenue-generating applications in years 2 and 3, respectively.

- Each revenue-generating application generates $20 million per year.

- The direct correlation of having a better-performing and more reliable application development system from the Akka Platform subscription is 5% of the organization's annual revenue.

Risks. Incremental gross revenue may vary, and specific considerations include:

- The significance of a particular application (both revenue-generating and nonrevenue-generating) to the overall annual revenue of the organization.

- Any supporting tools, resources, and infrastructures built and set up around the application development platform, which may share attribution to the performance improvement with Akka Platform.

Results. To account for these risks, Forrester adjusted this benefit downward by 20%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $3.3 million.

$3.3 million

three-year
benefit PV

38%
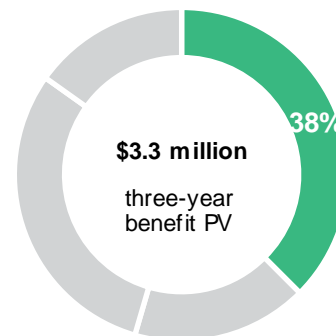
**Incremental Gross Revenue**
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
A1	Cumulative number of revenue-generating applications built using Lightbend	Composite	1	2	2
A2	Average revenue per application	D1	$20,000,000	$20,000,000	$20,000,000
A3	Total revenue from applications built on Lightbend	A1*A2	$20,000,000	$40,000,000	$40,000,000
A4	Direct correlation of Lightbend to revenue	Interview	5%	5%	5%
At	Incremental gross revenue	A3*A4	$1,000,000	$2,000,000	$2,000,000
	Risk adjustment	↓20%			
Atr	Incremental gross revenue (risk-adjusted)		$800,000	$1,600,000	$1,600,000
	Three-year total: $4,000,000		**Three-year present value: $3,251,690**		

FASTER TIME-TO-VALUE

Evidence and data. Using Akka Platform allowed the interviewed organizations to speed up their application development processes. This means that the organizations could realize the projected benefit of an application sooner. For revenue-generating applications, the organizations could see that revenue much sooner.

Interviewees noted time savings ranging from 50% to 75%, depending on which part of their business was involved.

- Some interviewees said Akka Platform allowed their organizations to add new products, services, or systems to the development process twice as fast compared to their prior environments.

- The cloud platform manager in the consumer electronics industry said: "Being able to model complex systems, build them, and test them in a way that is reliable is very valuable. If we used a more traditional architecture, it would take 1.5 to two times as long, taking into account how long it would take to debug issues, find the right data in the system, etc."

- Some interviewees said their organizations were able to cut their application development processes by as much as 75%. A senior director of engineering with an energy organization said, "The time from ideation to deployment in certain processes of our business has gone from four weeks to as fast as one week."

- The business unit head with the financial services organization said, "Having a platform that tells you what's going wrong instead of us having to find it all gives us as much as 75% in time savings."

- Each of the interviewed organizations realized this faster time-to-value benefit within the first year of implementing Akka Platform in their

environment. The CTO in the entertainment industry said: "By moving from our prior environment of PHP and Python to Akka Platform, we immediately realized much more efficient run times and savings in compute time. Once Akka Platform was implemented, the result was immediate."

Modeling and assumptions. For the composite organization, Forrester assumes:

- The development time per application prior to using Akka Platform is 12 months.

- Switching to Akka Platform generates 50% in time savings.

- The average revenue per application is $20 million with a profit margin of 10%.

- The composite organization builds one revenue-generating application in Year 1, and a second revenue-generating application in Year 2.

Risks. Faster time-to-value may vary, and specific considerations include:

- The time needed to develop applications.

- The time savings Akka Platform might produce depending on the use case.

- The average revenue each application developed on Akka Platform can generate per year.

- The number of revenue-generating applications versus back-end related applications.

Results. To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year, risk-adjusted total PV of $1.5 million.

$1.5 million

three-year
benefit PV

17%
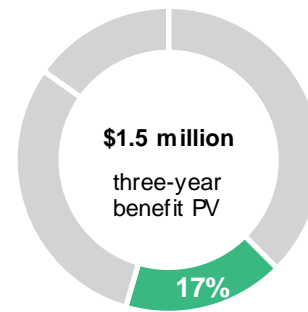
Faster Time-To-Value					
Ref.	Metric	Source	Year 1	Year 2	Year 3
B1	Development time per application prior to Lightbend (months)	Assumption	12	12	12
B2	Time savings from Lightbend (percentage)	Interview	50%	50%	50%
B3	Time saved with Lightbend (months)	B1*B2	6	6	6
B4	Average revenue per application built on Lightbend	D1	$20,000,000	$20,000,000	$20,000,000
B5	Profit margin	Assumption	10%	10%	10%
B6	Average profit margin per application built on Lightbend	B4*B5	$2,000,000	$2,000,000	$2,000,000
B7	Annual number of revenue-generating applications built on Lightbend	Composite	1	1	0
Bt	Faster time-to-value	B2*B6*B7	$1,000,000	$1,000,000	$0
	Risk adjustment	↓15%			
Btr	Faster time-to-value (risk-adjusted)		$850,000	$850,000	$0
	Three-year total: $1,700,000		Three-year present value: $1,475,207		

DEVELOPER EFFICIENCY

Evidence and data. Developers at the interviewed organizations benefitted from Akka Platform because they gained the ability to be more productive using the Akka Platform and the surrounding features and support from their Akka Platform subscriptions.

As the developers became more productive (even as business grew), the organizations could avoid hiring additional developers to match the growing demand for technical work.

- The cloud platform manager with the consumer electronics organization said that even with a customer base that doubles each year, he has been able to maintain the size of the organization's core team. He said, "Without Akka Platform, we would have had to hire 30% more engineers."

- An interviewed software engineer with an insurance organization said, "Since switching to Akka Platform, we've seen 20 times increase in our developer throughput."

- A senior director of engineering with an energy organization said: "The visibility into the source code and the various integration into systems allows the team to go from code to production in 20 minutes. [This] means each team is free to

deploy whenever it feels ready. This resulted in the team going from an orchestrated two-week release [schedule] to a daily release cadence."

- The CTO with the entertainment organization said: "The biggest benefit we realize from Akka Platform is developer productivity. We can do a completely custom data management platform and dynamic app configuration with only five people. Other companies would have more people or even hire an external partner to do what we can do with Akka Platform."

Modeling and assumptions. For the composite organization, Forrester assumes:

- The number of developers regularly using Akka Platform grows as the number of applications built and managed on Akka Platform grows. In Year 1, 10 developers regularly use Lightbend. In Year 2, 15 developers regularly use Akka Platform. In Year 3, that number increases to 20 developers.

- With Akka Platform, developers are twice as productive. This means the organization avoids hiring 50% more developers per year than it would have without Akka Platform.

- The average annual developer salary is $160,000.

Risks. Developer efficiency may vary, and specific considerations include:

- The complexity of any application developed, which can impact the number of developers needed.

- Different geographic locations, which can impact the average developer salary.

- Whether or not the organization uses the cost avoidance and/or productivity recapture from a more efficient developer differently.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of $2.6 million.

$2.6 million
three-year benefit PV

30%
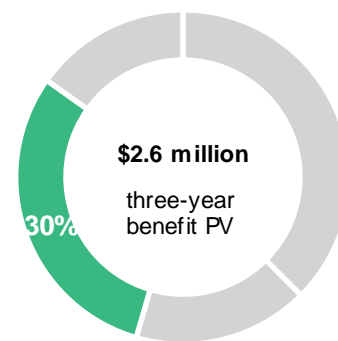
Developer Efficiency					
Ref.	Metric	Source	Year 1	Year 2	Year 3
C1	Developers regularly using Lightbend	Composite	10	15	20
C2	Additional developers needed without Lightbend (percentage)	Interview	50%	50%	50%
C3	Developers needed without Lightbend	C1*(1+C2)	15	22.5	30
C4	Avoided developer hires with Lightbend	C3-C1	5.0	7.5	10.0
C5	Average annual developer salary	Assumption	$160,000	$160,000	$160,000
Ct	Developer efficiency	C4*C5	$800,000	$1,200,000	$1,600,000
	Risk adjustment	↓10%			
Ctr	Developer efficiency (risk-adjusted)		$720,000	$1,080,000	$1,440,000
	Three-year total: $3,240,000		**Three-year present value: $2,629,001**		

INFRASTRUCTURE COST SAVINGS

Evidence and data. Akka Platform allowed the interviewed organizations to do more with less. In addition to increasing developer efficiency, they were also able to reduce their infrastructure footprints. Some of the interviewed organizations migrated from on-premises application development solutions, while others were already using cloud platforms. Interviewees from both types of organizations said their business was able to reduce its infrastructure costs.

- The cloud platform manager with the consumer electronics organization said, "Without Akka Platform, our database spend would have been two to three times higher."

- The IT director in the insurance industry spoke about switching to Akka Platform's reactive architecture. They said, "In certain areas of our business, we have been able to reduce the prior use of nine different databases into just one database."

- The business unit head with the financial services organization compared using Akka Platform with outsourcing the same work to an external managed services company. They said, "With Akka Platform, I'm doing the same work at half the cost."

- The senior director of engineering with the energy organization said: "Switching to Akka Platform has allowed us to gradually reduce our infrastructure cost — mainly AWS [Amazon Web Services] spend — at a 10% annual rate. This is mainly around decommissioning instances that are now absorbed into the Kubernetes cluster and provisioning additional instances to support the microservices."

- The CTO with the entertainment organization said: "[We saved] 10 times in server compute power requirement by using Akka Platform, which resulted in cost avoidance on database spend

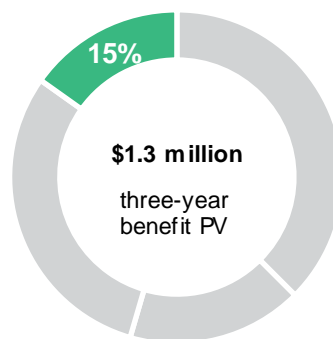that we would have needed if we did not have a Akka Platform subscription."

Modeling and assumptions. For the composite organization, Forrester assumes:

- The composite organization previously used cloud technology prior to switching to Akka Platform. The annual cost was assumed to be 2% of the assumed total revenue from all applications (both revenue-generating and back-end applications).

- Each application generates $20 million per year.

- The organization realizes 50% in infrastructure efficiency per year from its Akka Platform investment.

Risks. Infrastructure cost savings may vary, and specific considerations include:

- The organization's annual infrastructure spend, which depends on its specific use case of its application development platform.

- The total infrastructure cost savings, which may also vary depending on whether the company migrated from an on-premises solution or cloud environment.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of $1.3 million.

15%

$1.3 million
three-year
benefit PV

Infrastructure Cost Savings

Ref.	Metric	Source	Year 1	Year 2	Year 3
D1	Average revenue per application built on Lightbend	Assumption	$20,000,000	$20,000,000	$20,000,000
D2	Number of revenue-generating and nonrevenue-generating applications built on Lightbend	Composite	2	3	4
D3	Assumed total revenue from all applications built on Lightbend	D1*D2	$40,000,000	$60,000,000	$80,000,000
D4	Assumed infrastructure cost as a percentage of assumed total revenue from all applications	Assumption	2%	2%	2%
D5	Assumed infrastructure cost without Lightbend	D3*D4	$800,000	$1,200,000	$1,600,000
D6	Infrastructure efficiency due to Lightbend	Interview	50%	50%	50%
Dt	Infrastructure cost savings	D5*D6	$400,000	$600,000	$800,000
	Risk adjustment	↓10%			
Dtr	Infrastructure cost savings (risk-adjusted)		$360,000	$540,000	$720,000
	Three-year total: $1,620,000		**Three-year present value: $1,314,500**		

UNQUANTIFIED BENEFITS

Additional benefits that customers experienced but were not able to quantify include:

- **Improved customer experience.** Interviewees said using a better-performing system with Akka Platform improved the products and services they were able to offer along with customer experience. The business unit head with the financial services organization said, "Not spending much time doing compliance work freed our time to meet more customer demands and inquiries." The CTO with the entertainment organization said, "Not having outages directly means our customers enjoy our offerings more."

- **Increased employee satisfaction and closer collaboration.** Interviewees also highlighted how their developers and internal employees enjoyed the experience of using Akka, and how the platform supported them in doing their jobs. The senior director of engineering with the energy organization said: "Successfully breaking a monolith into microservices led to a huge morale jump in the engineering team. The developer experience is much nicer, smoother, and [more] likeable."

- **Benefit from open-source technology and a sense of community.** Interviewees said the fact that Lightbend provides its users with open-source access to some of its features is a benefit. The cloud platform manager with the consumer electronics organization said, "Open-source technology gives us a high level of confidence in investing because we see there's a community built around it."

FLEXIBILITY

The value of flexibility is unique to each customer. There are multiple scenarios in which a customer

might implement Akka Platform and later realize additional uses and business opportunities, including:

- **Scalability without risking performance and reliability.** Interviewees said Akka Platform not only allowed them to build better-performing applications, but it can also scale those applications as business needs grow and without worrying that scaling would undermine the quality. The business unit head with the financial services organization said: "To launch a new product, you must have the analysis. The data has to be pulled from different places. Akka Platform helped us build the infrastructure for that, which we can adjust according to any new business needs, and we believe that whatever we build will scale."

- **Increase institutional knowledge in modern technology.** Interviewees said their companies see reactive architecture and microservices as the technology of the future. An interviewed staff engineer with the insurance organization said: "Our investment in Akka Platform has helped our institutional knowledge around reactive architecture, which was previously this mysterious, nebulous thing. Now that we're on the other side of this investment, we see the value of Akka Platform specifically, while also having a better perspective on how to do things reactively — even outside the Akka Platform stack."

- **Having a partner for future endeavors and initiatives.** Interviewees said their companies do not see their engagement with Lightbend as a one-time purchase. The support and collaboration from Lightbend position it more as a partner for current and future projects. The cloud platform manager with the consumer electronics organization said: "We are working to better deploy services in our environments. We want to introduce better tools and mechanisms for

managing that, and we would be much better positioned to do that with Lightbend."

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 as applied to the composite

Total Costs

Ref.	Cost	Initial	Year 1	Year 2	Year 3	Total	Present Value
Etr	Akka Platform subscription fees	$0	$716,100	$1,293,128	$1,516,620	$3,525,848	$2,859,159
Ftr	Internal cost	$440,000	$88,000	$132,000	$176,000	$836,000	$761,322
	Total costs (risk-adjusted)	$440,000	$804,100	$1,425,128	$1,692,620	$4,361,848	$3,620,481

AKKA PLATFORM SUBSCRIPTION FEES

Evidence and data. Organizations pay an annual subscription fee for Akka Platform. Typically, customers start with a "developer" subscription for their development cycle, before moving to a "production" subscription when their application is ready for production. The production subscription is based on the footprint of the deployed application, which varies based on the application itself. Some may require a small footprint (in number of CPUs), while others require more. Furthermore, application growth is factored into the year-to-year subscription fee.

In addition to the annual subscription fee, some of the interviewees' organizations also leverage the embedded Lightbend engineer offering. ELEs serve as the "architect in residence" and accelerate the adoption of Akka Platform technologies. This ensures a well-planned transition from prototype to production, and it expedites productivity.

- The cloud platform manager with the consumer electronics organization said, "Having an expert of [Lightbend's] technology be a core contributor of our team is very valuable."

- The senior director of engineering in the energy industry said, "[Our organization uses] ELEs to jump-start our program with

workshops and introductions, and then we involve them in our company-level effort to migrate our monolith capabilities into ones supported by microservices."

- The IT director with the insurance organization said: "We had an ELE come in when we first kicked off our reactive launch, and they helped us with programming for the first year-and-a-half to make sure we know how best to use [Lightbend's] technology."

Modeling and assumptions. For the composite organization, Forrester assumes that:

- The composite uses Akka Platform to build two applications in Year 1, one application in Year 2, and one application in Year 3.

- The development cycle at the beginning of the implementation takes six months.

- The growth of each of the four applications varies between small, medium, and large/enterprise applications.

- Discounting applies as the total footprint grows.

- The composite organization purchases add-ons of one ELE in Year 1, and two total ELEs in years 2 and 3.

Risks. The following risks could affect the cost of Akka Platform subscription and services:

- The use case for each application being developed on Akka, which impacts the number of CPUs needed per year.

- The footprint and use-case growth of each of the applications developed, which could impact total footprint.

- The number of applications developed per year.

Results. To account for these risks, Forrester adjusted this cost upward by 5%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $2.9 million.

$2.9 million

three-year
cost PV

79%
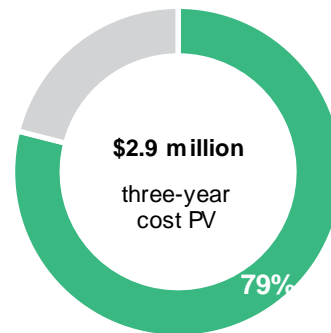
Akka Platform Subscription Fees						
Ref.	**Metric**	**Source**	**Initial**	**Year 1**	**Year 2**	**Year 3**
E1	Akka Platform subscription fees	Assumption	$0	$282,000	$431,550	$644,400
E2	Add-ons	Assumption	$0	$400,000	$800,000	$800,000
Et	Akka Platform subscription fees	E1+E2	$0	$682,000	$1,231,550	$1,444,400
	Risk adjustment	↑5%				
Etr	Akka Platform subscription fees (risk-adjusted)		$0	$716,100	$1,293,128	$1,516,620
	Three-year total: $3,525,848			**Three-year present value: $2,859,159**		

INTERNAL COST

Evidence and data. Internal costs include all the expenditures an organization spends internally to implement and maintain its Akka Platform subscription. Interviewees said the process of setting up Akka Platform in their organization was straightforward to complete. Nonetheless, there is expected to be some learning curve for an organization's developers in adopting and implementing Akka Platform into their processes.

- The senior director of engineering in the energy industry said their organization took six months to set up everything before its first production deployment, which involved five to six engineers.

- The IT director with the insurance organization said their setup took one to two months and involved an implementation partner that was identified by and included in their Lightbend pricing.

- The business unit head in the financial services industry said it took their organization six months to set up Akka Platform.

- The CTO with the entertainment organization said that after setting up everything, maintaining Akka Platform (outside of the actual process of building the applications) did not require much effort. Their organization had one person involved in the maintenance, which required about 25% of their full-time commitment.

Modeling and assumptions. For the composite organization, Forrester assumes that:

- The implementation process before the first production (i.e., the development cycle) takes six months and requires involvement from five FTE.

- After that, maintaining the Akka Platform requires 25% time of one FTE per application developed.

- Each FTE is assumed to have an average annual salary of $160,000.

Risks. The cost to implement and maintain Akka Platform may vary based on:

- The complexity and use case of each application being developed, which may impact the number of FTEs involved in both implementation and maintenance or the percentage of time each FTE needs to commit, as well as the potential need for additional external partners.

- The types of FTEs involved in the process, which may impact the average annual salary.

Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV of $761,000.
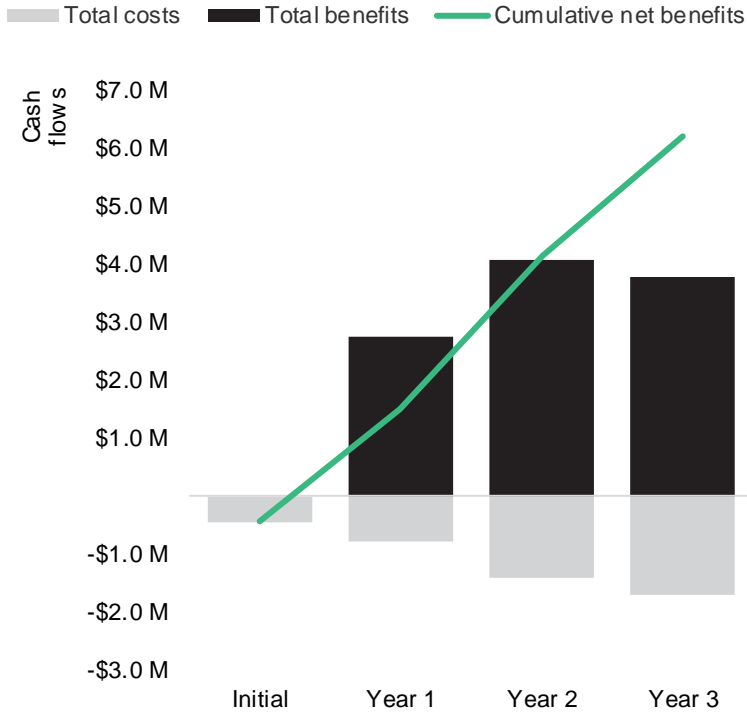

21%

$761,322

three-year
cost PV
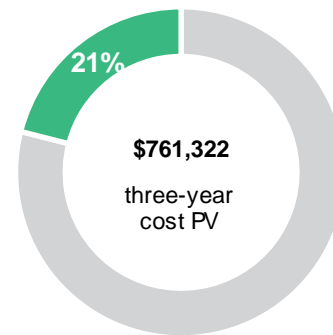
Internal Cost						
Ref.	**Metric**	**Source**	**Initial**	**Year 1**	**Year 2**	**Year 3**
F1	Time for implementation (years)	Composite	0.5	0	0	0
F2	FTE needed for implementation	Interview	5	0	0	0
F3	Average FTE annual salary	Assumption	$160,000	0	0	0
F4	Total internal cost for implementation	F1*F2*F3	$400,000	0	0	0
F5	FTE needed for maintenance per application	Interview	0	0.25	0.25	0.25
F6	Number of total applications built on Lightbend	D2	0	2	3	4
F7	Average FTE annual salary	Assumption	0	$160,000	$160,000	$160,000
F8	Total internal cost for maintenance	F5*F6*F7	0	$80,000	$120,000	$160,000
Ft	Internal cost	F4+F8	$400,000	$80,000	$120,000	$160,000
	Risk adjustment	↑10%				
Ftr	Internal cost (risk-adjusted)		$440,000	$88,000	$132,000	$176,000
	Three-year total: $836,000			**Three-year present value: $761,322**		

Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)

Legend: Total costs | Total benefits | Cumulative net benefits

Y-axis (Cash flows): $7.0 M, $6.0 M, $5.0 M, $4.0 M, $3.0 M, $2.0 M, $1.0 M, -$1.0 M, -$2.0 M, -$3.0 M

X-axis: Initial, Year 1, Year 2, Year 3

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 Analysis (Risk-Adjusted Estimates)	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total costs	($440,000)	($804,100)	($1,425,128)	($1,692,620)	($4,361,848)	($3,620,481)
Total benefits	$0	$2,730,000	$4,070,000	$3,760,000	$10,560,000	$8,670,398
Net benefits	($440,000)	$1,925,900	$2,644,873	$2,067,380	$6,198,153	$5,049,917
ROI						139%
Payback period (months)						<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] Source: "Design For Dependability By Embracing A Future Of Trusted Technology," Forrester Research, Inc., February 25, 2019.
[2] Source: "Cloudflow: Accelerate Your Real-Time Streaming Journey," Lightbend (https://www.lightbend.com/cloudflow-accelerate-real-time-journey).
[3] Source: "How To Capture The Benefits Of Microservice Design," Forrester Research, Inc., May 26, 2016.