A Forrester Total Economic Impact™
Study Commissioned By Snowflake
July 2020

The Total Economic Impact™ Of Snowflake's Cloud Data Platform

Cost Savings And Business Benefits Enabled By Snowflake's Cloud Data Platform

FORRESTER®

Table Of Contents

Project Director:
Faram Medhora

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®

Key Benefits

Accelerated time-to-market:
$5.01 million

Increased profit:
$4.79 million

Improved decision-making from faster access to data:
$3.68 million

Simplified data operations:
$2.11 million

Infrastructure and database management savings:
$5.95 million

Executive Summary

In today's hypercompetitive business environment, harnessing and applying data and analytics at every opportunity to differentiate your product and customer experiences is quickly becoming a prerequisite for success. Many firms have started maturing their aspects of being an insights-driven business, but much of this is within the context of individual projects, departments, or functions. Firms possess a plethora of products and services to gather, process, and analyze data, which they usually procure and implement to meet specific requirements. This approach isolates data and insights in application silos. Leading insights-driven businesses centralize and democratize the access of the right data across the entire enterprise, by embedding data within applications and allowing different groups across the enterprise to independently access, manage, and combine different data types for insights that are relevant to them. They implement data platforms which reside in an integrated architecture that allows data and insights to flow between multiple areas. They also integrate this technology with systems of engagement — business applications and customer engagement points — that allow insights to directly drive decisions, experiences, and actions. These insights enable businesses to differentiate products and customer experiences in order to build larger customer and brand loyalty.

Snowflake's cloud data platform allows firms to consolidate analytics across data warehouses, data marts, and data lakes into a single source of truth. It also streamlines how diverse teams share governed data, internally and externally, in order to collaborate across all data without having to copy data and move it from place to place. This simplifies data sharing, allows users to set up pertinent data access restrictions, and minimizes the data governance and compliance issues of managing multiple copies of the same data sets. Snowflake's unique architecture separates storage resources from compute resources: All workloads can simultaneously leverage just the compute power they need, when they need it, without contention. Thus, delivering higher performance in a flexible, scalable, and cost-effective manner. Snowflake commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying Snowflake's cloud data platform. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Snowflake on their organizations.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed several customers with years of experience using Snowflake's cloud data platform. Snowflake offers an elastic and scalable platform in the cloud that is highly automated to simplify provisioning, ingestion, transformation, data processing, and administration.

Prior to using Snowflake, interviewed customers leveraged multiple on-premises or cloud data warehouse solutions with siloed data sets scattered across their enterprises. However, prior attempts yielded limited success, leaving customers with a high cost of delivering and managing data and extended implementation and report-generation times. These limitations led to business users having difficulty getting a holistic view of the data as well as being unable to make well-informed, data-driven decisions. Customers leveraged Snowflake to make data available quickly for the consumers, to garner timely insights, and do more with data — while ensuring operational efficiency at a lower cost.

ROI
612%

Benefits PV
$21.5 million

NPV
$18.4 million

Key Findings

Quantified benefits. The following risk-adjusted present value (PV) quantified benefits are representative of those experienced by the companies interviewed:

- **Cost savings from accelerated time-to-market worth $5 million.** Snowflake enabled the interviewed customers to launch new products and enhancements faster than their previous solutions. The platform's ability to simplify provisioning, ingestion, transformation, data processing, and administration reduced the time and resources needed to deploy products.
- **Increased profit from faster time-to-market of $4.8 million.** This accelerated go-to-market timeframe enabled interviewees to launch products and enhancements faster, which meant they could recognize revenue sooner, ultimately translating to higher profit.
- **Improved decision-making support from faster access to data saves $3.7 million.** Snowflake enabled its customers to connect data across multiple disparate systems and generate reports within the timeframe demanded by the business users. It also put data in the hands of business users who previously didn't have access. With more business owners making decisions aided by more relevant data and entirely new insights, interviewees were able to get ahead, move faster, and ultimately improve their organizations' bottom lines.
- **Simplified data operations save $2.1 million.** The interviewed customers' business and IT teams experienced productivity benefits. Snowflake empowered the business users to use self-service capabilities to discover the data across the enterprise, create their own models, test environments, run queries, and manage access privileges themselves.
- **Infrastructure and database management savings worth $5.9 million.** Snowflake – delivered to customers as a service – had higher performance and scalability than the prior platforms deployed by the interviewees. Additionally, Snowflake needed a small infrastructure footprint and fewer IT resources to administer and maintain the platform. Snowflake's ability to scale up and down to deliver computing resources as needed, depending on the query or workload requirements, allowed the interviewees to optimize resource utilization.

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

- **Empowering business users through self-service.** Interviewees appreciated Snowflake's integrated platform that delivered user-friendly, self-service business capabilities to secure data and manage user access.
- **Flexibility to work across multiple cloud platforms.** Snowflake supports a multicloud strategy, including a cross-cloud approach to mix and match various clouds. This gave interviewees the flexibility to implement workloads in different cloud environments and remove the risk associated with their dependency on just one cloud provider.

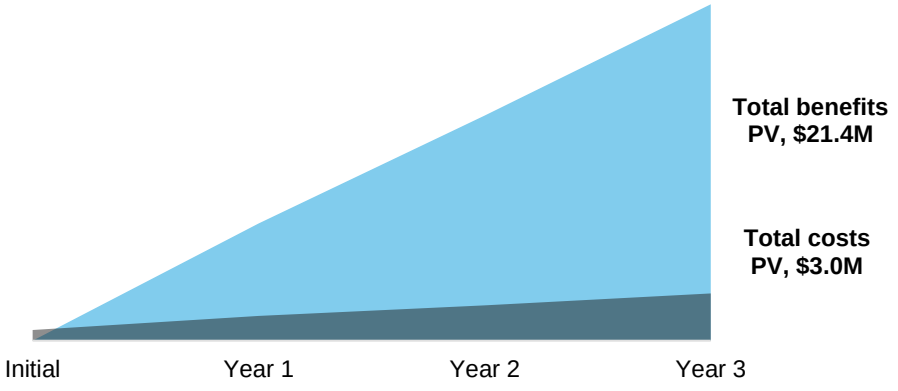
- **High satisfaction with Snowflake's account team.** Interviewees proactively praised Snowflake's support. The manager of a software company said, "The Snowflake account team support has been fantastic." Another interviewee, the director of a CPG firm said, "Snowflake has been generous to allocate resources to explain functionality."
- **Improved client retention by getting a better understanding of their journey and pain points.** The interviewed companies were better positioned to retain their clients by getting their hands on granular, time-relevant, and client-specific data; this was not possible in the prior platform. They had a better understanding of the specific client journeys and were able to identify the client's challenges and quickly address them. The VP of a financial institution added, "We can now track and quickly address customer complaints for our 1 million customers."
- **No need to schedule downtime for system updates.** Interviewees appreciated not having to schedule downtime for making updates to the Snowflake platform. This reduced the time and effort needed for the interviewees' IT teams to handle change management procedures.
- **Monitor risk and react quickly.** Interviewees could better monitor compliance and risk through Snowflake. The platform could ingest different data sets and process it quickly to deliver spot anomalies.

Costs. The interviewed organizations experienced the following risk-adjusted PV costs:

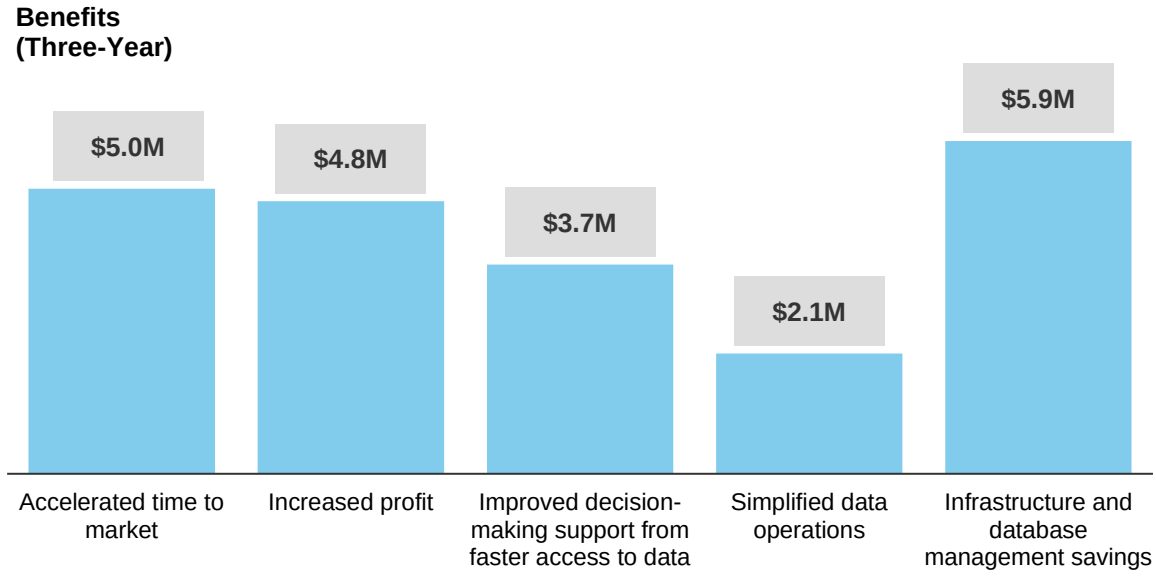
- **Resource cost to support due diligence, implement, and on-going management of $1.8 million.** Interviewees deployed resources to evaluate the product, implement the pilot, rollout the platform to the user, and provide subsequent maintenance and expansion support.
- **Fees to Snowflake were $1.1 million.** This cost comprised of the software-as-a-service (SaaS), which included maintenance and management.

Forrester's interviews with four existing customers and subsequent financial analysis found that an organization based on these interviewed organizations experienced benefits of $21.45 million over three years versus costs of $3.0 million, adding up to a net present value (NPV) of $18.4 million and an ROI of 612%.

Financial Summary



FORRESTER®


Benefits
(Three-Year)
$5.0M
$4.8M
$3.7M
$2.1M
$5.9M
Accelerated time to market
Increased profit
Improved decision-making support from faster access to data
Simplified data operations
Infrastructure and database management savings

FORRESTER®

TEI Framework And Methodology

From the information provided in the interviews, Forrester has constructed a Total Economic Impact™ (TEI) framework for those organizations considering implementing Snowflake's cloud data 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 Snowflake 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 Snowflake stakeholders and Forrester analysts to gather data relative to Snowflake's cloud data platform.

CUSTOMER INTERVIEWS
Interviewed four organizations using Snowflake 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 Snowflake's impact: benefits, costs, flexibility, 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.

Snowflake's Cloud Data Platform Customer Journey

BEFORE AND AFTER SNOWFLAKE INVESTMENT

Interviewed Organizations

For this study, Forrester conducted four interviews with Snowflake's customers. Interviewed customers include the following:

INDUSTRY	REGION	INTERVIEWEE	ENVIRONMENT
Software	United States	Manager, technical operations	$100M in annual revenue 500 employees 10 PB of data
Financial institution	Global	VP, data engineering	Billions in annual revenue >20,000 employees 1 PB of data
Consumer packaged goods (CPG)	Global	Director, enterprise architecture and analytics	$10B in annual revenue 25,000 employees 500 TB of data
Software	Global	Chief product officer	$700M in annual revenue 3,000 employees 40 TB of data

Key Challenges

Prior to implementing Snowflake, the interviewed organizations had a mix of different systems and platforms that stored data in silos across their organizations. The challenges experienced by the customers with their previous platforms include:

> "It was hard to manage data silos and get a consolidated view of data across the organization."
>
> *Chief product officer, software*

- **Consolidating siloed data across multiple systems within the organization was cumbersome and limited the value that business users could extract.** Interviewees struggled to support the evolving business data needs because connecting and loading data from different vendor solutions was a complex and time-consuming exercise. The chief product officer of a software company said, "Prior to Snowflake, it was hard to get a consolidated view of data across the multiple, siloed data domains, and accommodating the business needs made our environment highly complex."
- **Platforms could not support the aggressive implementation timelines desired to launch new products into the market.** Multiple interviewees raised concerns that their previous on-premises and cloud data warehouse platforms would delay their overall product implementation timeline because of the added effort for configuration and provisioning.
- **Performance-related issues plagued day-to-day operations.** Previous platforms presented several technical challenges centered around solution scalability and prolonged processing times. The limitations of the previous environment led the organizations to:
    - **Procure and maintain a large IT infrastructure footprint needed to support growing data volumes.** Interviewees noted scalability concerns with the previous environment. The executive of a CPG firm stated: "Our previous on-premises

platform would keep running out of memory, so we had to add more hardware and keep optimizing the system constantly. All this made the environment heavy to maintain." Another executive of a financial services company explained, "Because the [previous] platform was not flexible, we had to dedicate more hardware resources to handle our highest peak processing needs which, would only be during month-ends to handle batch jobs."

- **Deploy additional IT resources.** The executive of a software company explained: "We had to set up a separate data processing platform instance to handle the large volume of event data and maintain a replica of the data in the data warehouse. This had to be done because it took a long time for the platform to process the data." Consequently, making the environment more complex, and increasing the resources needed to maintain these additional systems.

› **Making data available in this siloed, slow, complex data environment was extremely costly.** The previously mentioned limitations of the legacy platform led the interviewed organizations to incur additional costs to combat these scalability and flexibility issues. The manager of a software company said, "We had to keep throwing in more hardware to accommodate the business needs while dealing with the performance issues and complexity of running the previous platform, which also required significant support resources."

Objectives And Solution Requirements

To solve these challenges, interviewees sought a central data warehouse platform that could quickly ingest data, handle queries on large data sets, and support new business use cases; all this while being scalable and cost-effective. The interviewed organizations searched for a solution that could:

› Make data accessible to business users faster.

› Lower the cost of hardware, software, and related services needed to make the data accessible.

› Improve the time taken to process large data sets.

› Simplify the technology landscape and move to the cloud.

› Expand options and features that could be delivered on top of their product offerings.

After an extensive product evaluation process that involved prototyping and running full tests across multiple vendor platforms, interviewees selected Snowflake's cloud data platform and began deployment. Three of the four interviewees initially deployed the data warehouse workload and subsequently planned to gradually introduce new workloads such as data science and data engineering.

> "We wanted to improve our cost to make data available for the business users."
>
> *Manager, infrastructure engineering department, software company*

Key Results

The interviews revealed that key results from Snowflake's investment include:

- **A single data platform that supports many workloads.** Before Snowflake, interviewees struggled to consolidate all of their siloed data. Snowflake's ability to easily ingest new data sets in conjunction with its separation of storage and compute, allowed organizations to deliver analytics directly to business users, ultimately improving their ability to make key decisions. Snowflake's self-service capabilities enabled these business users to be more hands-on with the data. Their productivity increased as they no longer had to depend on IT support or data teams. The chief product officer mentioned: "The platform simplified our operations and was seamless to adopt. Users could easily correlate data across products." Additionally, the business users could govern access to the data with low dependency from the IT teams.
- **Secure data sharing and the mobilization of data.** Interviewees no longer had to maintain duplicate copies of data and endure inefficient processes to share data inside and outside their businesses. With Snowflake they could give partners and customers access to live data quickly and securely. One software company could differentiate their product offering by increasing transparently and sharing granular data with their customers. A Director of CPG said, "We can better control access to data using Snowflake, it is easy to create schemas and grant access."
- **Better performance at a lower operating cost.** Because Snowflake is delivered as a hosted software-as-a-service, all the interviewees were able to lower their IT operating costs while improving system performance. The manager of a software company said, "Better performance at [a] lower price gives us more confidence to develop additional products." Interviewees no longer required a large dedicated compute and storage infrastructure footprint or had to maintain multiple replicas of the same data to accommodate the poor scalability and performance of the prior platforms. Using Snowflake, the interviewees could dynamically spin up/down IT resources (compute, storage) to support the workloads. The VP of a financial institution claimed, "We spin up IT resources to generate our month-end reports and release resources once done."

> "Our business users love Snowflake's self-service capabilities and are highly satisfied customers. We [the IT team] are becoming very popular and in-demand with other lines of business."
>
> *Director, enterprise architecture, CPG*

> "Better performance at [a] lower price gives us more confidence to develop additional products."
>
> *Manager, technology operations, software company*

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 and 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:

Description of composite. The $5 billion organization with a large customer base continually pushes to deliver diverse data sets at the time needed for the business users to generate insights and make data-driven decisions.

The organization currently has a sizable on-premises footprint with siloed and diverse data sets stored across the organization on different vendor platforms. Multiple acquisitions over the past several years have led to this heterogeneous environment. Prior to Snowflake, the organization leveraged outsourced vendor resources to support the product development and provide ongoing IT maintenance support.

Deployment characteristics. The organization initially implemented Snowflake to support a specific project that required consolidating multiple data sets. After experiencing success, the composite organization expanded its platform use across other lines of business.

The composite organization moved 250 TB of data into Snowflake in Year 1, with a projected year-over-year growth of 50%, thus reaching 563 TB by Year 3. The organization leveraged services from third-party vendors to assist in large implementation projects.

Key composite organization characteristics:

- $5 billion in revenue
- 563 TB of data in Snowflake by Year 3
- Sizable on-premises footprint of siloed and diverse data sets

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	Accelerated time-to-market	$4,680,000	$480,519	$480,519	$5,641,038	$5,012,690
Btr	Increased profit	$1,275,000	$2,422,500	$2,167,500	$5,865,000	$4,789,632
Ctr	Improved decision-making support from faster access to data	$0	$2,160,000	$2,520,000	$4,680,000	$3,678,437
Dtr	Simplified data operations	$685,425	$861,413	$1,037,400	$2,584,238	$2,114,439
Etr	Infrastructure and database management savings	$1,593,720	$2,390,580	$3,230,190	$7,214,490	$5,851,412
	Total benefits (risk-adjusted)	$8,234,145	$8,315,012	$9,435,609	$25,984,766	$21,446,610

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 more than $21 million.

Accelerated Time-To-Market

Snowflake enabled the interviewed customers to launch new products and enhancements faster than their previous solutions. The platform's ability to simplify provisioning, ingestion, transformation, data processing, and administration reduced the time and resources needed to deploy products.

- One interviewed organization launched a new product within 10 months of implementing Snowflake. Its VP of data engineering said, "This could easily have taken us two to three times the time with the same number of resources if we used our previous platform." This reduction in the timeframe lowered the company's spend on 300 full-time developers.

In modeling this benefit, Forrester made the following assumptions:

- Without Snowflake, the composite organization would have spent 10 months with 50 full-time developers to roll out the initial product. Subsequently, enhancement projects in Years 2 and 3 would require 12 full-time developers for two months.
- With Snowflake, the composite organization completes these projects in half the time.
- The organization leveraged outsourced vendor resources to complete these projects.
- Prior to using Snowflake, the composite organization would routinely add more data sources. This effort required four internal resources for a total of two months per year each. With Snowflake, it witnessed a time savings of 75%.

50% reduction in time to roll out the business product

FORRESTER®

- These internal resources were able to recapture 60% of the time savings to focus on improving service delivery, data quality, and other strategic initiatives.

The benefit will vary with:

- The organization's resources and its desire to move quickly.
- The organization's use of internal and external development resources.
- The number of systems that the platform needs to connect to and the volume of data.
- The frequency at which the organization tackles new product launches and introduces new data sources.
- The organization's fully loaded salaries.

Forrester adjusted this benefit downward by 10% to account for the variance of resource value and effort across different types of organizations, yielding a three-year, risk-adjusted total PV of $5 million.

Accelerated Time-To-Market: Calculation Table					
REF.	**METRIC**	**CALC.**	**YEAR 1**	**YEAR 2**	**YEAR 3**
A1	Time required to develop a new *large product* using traditional data warehouse (months)	Composite	10		
A2	Time required to develop a new *medium sized product* using traditional data warehouse (months)	Composite		4	4
A3	Developers required for projects (outsourced vendor resources)	Composite	50	12	12
A4	Cost per outsourced developer resource	Industry average	$249,600	$249,600	$249,600
A5	Time saved by using Snowflake for projects	Based on customer interviews	50%	50%	50%
A6	Project implementation cost savings (rounded)	(A1+A2)/12*A3*A4*A5	$5,200,000	$499,200	$499,200
A7	Time required to add new data/data sources using traditional data warehouse (months)	Composite		2	2
A8	Resources required to load data (internal resources)	Composite		4	4
A9	Time saving by using Snowflake to load data	Based on customer interviews		75%	75%
A10	Average fully loaded developer salary (internal resources)	Industry average	$0	$115,700	$115,700
A11	Productivity recapture for resources loading data	Based on customer interviews		60%	60%
A12	Time savings for internal resources loading data (rounded)	(A7/12)*A8*A9*A10*A11		$34,710	$34,710
At	Accelerated time-to-market	A6+A12	$5,200,000	$533,910	$533,910
	Risk adjustment	↓10%			
Atr	Accelerated time-to-market (risk-adjusted)		$4,680,000	$480,519	$480,519

Increased Profit

This accelerated go-to-market timeframe outlined above enabled interviewees to launch products and enhancements faster, which meant they could recognize revenue sooner and ultimately translate that into higher profits. Interviewees used Snowflake's single, integrated platform to provide instant, secure, and governed access to connected data. Business owners at these organizations used these diverse sets of newly connected data and processing capabilities to launch new products or enhance existing products faster than they could have previously.

- One interviewed organization implemented Snowflake to support the development of a new product. According to the interviewee, they launched this product one year earlier as a result of Snowflake, "Our leadership had an aggressive timeline which we were able to meet because of Snowflake." Getting the product to market faster meant getting a competitive edge and bringing customers on board faster, i.e., more revenue was generated sooner.
- A software company expects positive revenue growth from incorporating Snowflake features directly into its business product, thereby delivering a differentiated product offering. The interviewee from a software company was enhancing its organization's product offering by directly extending Snowflake's capabilities to customers. The chief product officer said, "Snowflake has enabled us to differentiate ourselves in the marketplace: Our commercial competitors cannot offer similar product features at the same level of maturity." The interviewee was planning to launch the product in the second half of this year and has estimated the revenue growth impact to be $25 million directly from this new product offering.

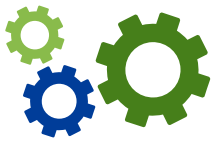
In modeling this benefit, Forrester made the following assumptions:

- The composite organization spent the first half of Year 1 working on a new product, which it brought to market late that year.
- The composite organization onboarded 50,000, 145,000, and 230,000 customers in Years 1, 2, and 3, respectively.
- The average annual customer value is $200.
- By using the previous solution, the product launch would have taken an additional year.
- Average operating margin was 15%.

The determination of profit will vary with:

- The market demand and product viability.
- The organization's agility.
- The average annual customer value.
- The average operating margin.

To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year, risk-adjusted total PV of $4,789,632.



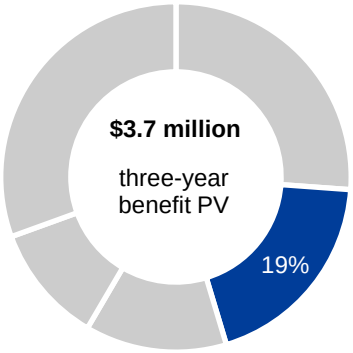
Accelerated go-to-market timeframes enabled interviewees to launch products and enhancements faster, thus earning revenue sooner.

Increased Profit: Calculation Table					
REF.	**METRIC**	**CALC.**	**YEAR 1**	**YEAR 2**	**YEAR 3**
B1	Customers with Snowflake	Composite	50,000	145,000	230,000
B2	Customers without Snowflake (offset one year)	Composite	$0	50,000	145,000
B3	Average customer value (yearly)	Composite	$200	$200	$200
B4	Revenue without Snowflake with margin	B2*B3	$0	$10,000,000	$29,000,000
B5	Revenue with Snowflake with margin	B1*B3	$10,000,000	$29,000,000	$46,000,000
B6	Operating margin	Industry average	15%	15%	15%
Bt	Increased profit	(B5-B4)*B6	$1,500,000	$2,850,000	$2,550,000
	Risk adjustment	↓15%			
Btr	Increased profit (risk-adjusted)		$1,275,000	$2,422,500	$2,167,500

Improved Decision-Making Support From Faster Access To Data

Prior to Snowflake, business owners made decisions with days-old data across multiple disjointed reports. Data scientists spent significant time trying to find and pull siloed data from different sources to build comprehensive reports before passing them on to the business. Snowflake helped consolidate the diverse sets of siloed data to establish a single source of truth. Not only did it reduce the time required to generate those reports but it also gave the business users direct visibility into the underlying data — including data that was not possible to consolidate using their prior platform. Most interviewees were impressed with their newfound ability of quickly leveraging new data sets and enabling the data into generating new business insights. Countless decisions, which have been made with this relevant data and combined with entirely new insights, led to wins across the business. For example:

- One interviewee was able to generate reports 1.5 times faster after moving to Snowflake. The director of a CPG firm said: “We had historical data across four systems which were needed to generate our reports. We were able to lower the time from five days to two days using Snowflake.” The same organization was also able to improve its supply chain efficiency with Snowflake. The director continued, “We would take several days to generate our supply chain reports using the previous system, but it now takes less than a day in Snowflake.” Business executives met daily to review this report and make prompt tactical and strategic decisions. They estimated that the impact of these faster decisions led to at least a 0.1% efficiency throughout their supply chain.



Improved decision-making support from faster access to data: 19% of total benefits

- A software company saved double-digit millions through predictive analysis that would not have been possible without Snowflake. The chief product officer explained, “We were able to track utilization of our technology caused by the [COVID-19] pandemic.” Armed with these insights, the company was able to get ahead of demand and meet all future customer needs without incurring additional costs. A financial institution spotted an issue in the business logic of their new product within a few hours, a catch that would have taken days with their previous solution. When this same organization launched a new B2C product, it could review friction points within 3 hours due to Snowflake’s ability to quickly load and process data. The team noticed an issue where the business system was erroneously rejecting new customer applications. The VP commented: “Without Snowflake, it could have taken us more than a day to determine the mishap. We limited the impact to 100 customers, which could easily have been 600 to 700 customers.”
- One interviewee continually reviewed marketing models to address different customer needs. Snowflake enabled a financial institution to perform data analysis, of which wasn’t possible in the prior platform. The VP said, “We can track individual jobs and link ROI to queries, this was only possible in Snowflake.” Further, the interviewee could quickly track and address customer complaints, monitor risks, and better understand customer journeys. The VP added, “We could address customer issues promptly as we now receive data in real-time.”

In modeling this benefit, Forrester made the following assumptions:

- The composite organization spends 40% of revenue ($5 billion) on goods sold.
- The composite organization migrated the key data into Snowflake in the back half of Year 1 and began generating new insights at the beginning of Year 2. As a result, it experienced a 0.12% improvement in Year 2 and a 0.14% improvement in Year 3.

The benefit will vary based on:

- The difference in annual revenue and the cost of goods sold.
- The amount of room for improvement in the supply chain.
- The ability of the organization to act quickly.
- The margin under which the business operates, macro-level conditions, and the impact of the actions taken based on the insights.

To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of $3,678,437.

Improved Decision-Making Support From Faster Access To Data: Calculation Table					
REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
C1	Cost of sales	40% of revenue		$2,000,000,000	$2,000,000,000
C2	Percentage improvement to the margin	Composite		0.12%	0.14%
Ct	Improved decision-making support from faster access to data	C1*C2	$0	$2,400,000	$2,800,000
	Risk adjustment	↓10%			
Ctr	Improved decision-making support from faster access to data (risk-adjusted)		$0	$2,160,000	$2,520,000

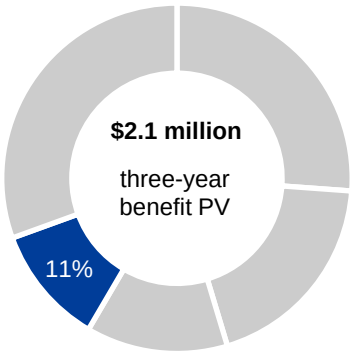
Simplified Data Operations

Before Snowflake, business users such as analytical teams would heavily depend on IT/data support teams to furnish data, provide analytical environments, manage privileges, troubleshoot issues with data, and generate reports. The business and IT users would spend several hours going back and forth discussing/clarifying their questions, fixing, and then validating whether or not the issue was resolved. Snowflake eliminates the time and effort spent by the business users to connect with IT and then wait for the output. Snowflake empowers business users through self-service analytics to discover the data across the enterprise, create their models, run queries, and manage access privileges themselves. Consequently, it reduces the time taken by the business users to accomplish their tasks and relieves the IT/data support teams to spend more of their time on strategic value-add initiatives.

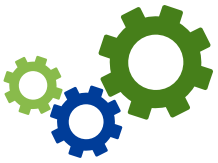
- Improving business user productivity and lowering IT dependency was commonly heard across the interviewed companies. The director of a CPG firm said, “We had a 25% reduction in effort for our analytics production support team.” They can now focus on improving the data through initiatives such as data cataloging.
- The financial institution’s data team experienced efficiency gains of 50%. The interviewee noted, “Snowflake’s clear presentation layer to manage data helped save 50% of my staff’s time.” With that staff being the data and analytics team.
- Similarly, the manager of a software company stated, “We were able to reduce the effort of our IT support team, lowered [their efforts] by 75%, because it is not as complex or problematic as our prior system.”

For the composite organization, Forrester assumes that:

- The composite organization had 14 users within a data and business analytics team.
- The efficiency to load and query data improves yearly, as the users become proficient using the platform and leveraging Snowflake and with new enhancement releases. The composite organization experiences a 35% improvement in Year 1, a 45% improvement in Year 2, and a 55% improvement in Year 3.
- The blended average fully loaded salary of data scientists is $195,000.



Simplified data operations: 11% of total benefits



25% reduction in effort for the analytics production support team and **75% reduction in effort** for the IT support team.

FORRESTER®

- The IT support team comprises of five individuals, each of whom reduces their effort by 75%. Their fully loaded average salary is $130,000.
- Internal IT resources recapture 50% of time saved for productive activities.

The impact of simplifying data operations will vary with:

- The number of the data and business analytics teams using Snowflake.
- The effort needed to load and query data.
- The salary of the data scientists and engineers.
- The degree to which the previous system offered self-service and the business team's dependence on IT teams.

To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV of $2,114,439 million.

Simplified Data Operations: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
D1	Size of data and business analytics teams using Snowflake	Composite	14	14	14
D2	Reduction in effort to query and process data to generate reports	Based on customer interviews	35%	45%	55%
D3	Blended average fully loaded salary of the data scientists and engineers	Industry average	$195,000	$195,000	$195,000
D4	Number of IT resources supporting the data and business analytics teams	Composite	5	6	7
D5	Percentage of IT time affected by adopting Snowflake	Based on customer interviews	75%	75%	75%
D6	Average fully loaded salary for an IT engineer	Industry average	$130,000	$130,000	$130,000
D7	Productivity recapture	Based on customer interviews	50%	50%	50%
Dt	Simplified data operations	(D1*D2*D3)+(D4*D5*D6)*D7	$721,500	$906,750	$1,092,000
	Risk adjustment	↓5%			
Dtr	Simplified data operations (risk-adjusted)		$685,425	$861,413	$1,037,400

Infrastructure And Database Management Savings

Snowflake had higher performance and scalability than the prior platforms deployed by the interviewees. Additionally, Snowflake needed a small infrastructure footprint and fewer IT resources to administer and maintain the platform.

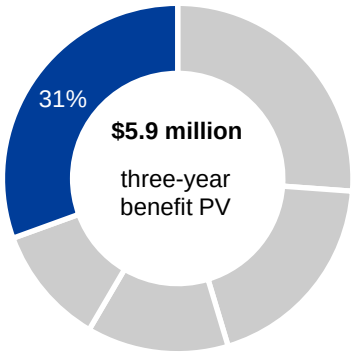
- A software company reduced the data processing time by 50%. In the prior platform, the interviewee had to leverage multiple data processing technologies to process the data sets quickly and then replicate the same to the data warehouse. With Snowflake, the interviewee moved the data directly to the data warehouse, reducing the need to maintain and move similar data sets between a separate data processing platform and Snowflake. The manager said, "We moved 21 to 25 TB per day from the other data processing platform to the previous data warehouse; we reduced it to 4 to 5 TB with Snowflake." The interviewee derived direct cost savings by reducing the IT hardware (compute and storage) footprint.
- Similarly, the VP of a financial institution said, "We saw a 50% to 60% savings compared to our traditional data warehouse platform." Snowflake's ability to scale up and down to deliver computing resources as needed, depending on the query or workload requirements allowed the interviewee to optimize the resource utilization. They stated, "We spin up more resources to generate month-end reports and release them once it's done."
- Another interviewee witnessed a five times reduction in the size of data by using Snowflake's compression. The director of a CPG firm said, "We reduced our storage capacity from 650 TB to 130 TB through Snowflake without compromising the performance." The interviewee also reduced the time and resources required for downtime servicing and upgrades, as compared to the previous platform. They added, "Snowflake gets upgraded without any downtime, so we save 100+ hours of time for the maintenance team."

For the composite organization, Forrester assumes that:

- The composite organization started with 250 TB of data in Snowflake in Year 1 and added 50% per year, i.e., 375 TB in Year 2 and 563 TB in Year 3.
- The average annual cost of hardware for an on-premises data warehouse platform is $1,200 per terabyte.
- The reduction in the hardware footprint between the former on-premises data warehouse and Snowflake is 60%.
- The IT resources required to maintain the prior on-premises data warehouse are 8, 10, and 12 in Years 1, 2, and 3, respectively.
- The reduction of outsourced IT resources with Snowflake is 80%.
- The average fully loaded salary of the data warehouse engineer is $187,200.

The reduction in software development expense will vary with:

- The size of the data stored in the data warehouse.
- The type of deployment (cloud, on-premises), platform, and hardware footprint for the data warehouse solution.
- The cost per terabyte of the hardware of the prior data warehouse.



Infrastructure and database management savings: **31%** of total benefits

60% reduction in on-premises data warehouse environment by moving to Snowflake

FORRESTER®

› The fully loaded compensation of data warehouse engineers.

To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV of $5,851,412.

Infrastructure And Database Management Savings: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
E1	Data in Snowflake (terabytes)	Composite	250	375	563
E2	Cost for hardware for an on-premises data warehouse platform (per terabyte)	Industry average	$1,200	$1,200	$1,200
E3	Legacy cost for on-premises data warehouse hardware	E1*E2	$300,000	$450,000	$675,000
E4	Percentage of reduction of the on-premises data warehouse environment by moving to Snowflake	Based on customer interviews	60%	60%	60%
E5	Resources required to maintain the on-premises data warehouse	Composite	10	15	20
E6	Reduction in data warehouse resources due to Snowflake	Based on customer interviews	80%	80%	80%
E7	Average outsourced resource cost for a data warehouse data engineer	Industry average	$187,200	$187,200	$187,200
Et	Infrastructure and database management savings	(E3*E4)+(E5*E6*E7)	$1,677,600	$2,516,400	$3,400,200
	Risk adjustment	↓5%			
Etr	Infrastructure and database management savings (risk-adjusted)		$1,593,720	$2,390,580	$3,230,190

Unquantified Benefits

In addition to the benefits outlined above, the interviewed organizations shared other benefits that either did not have specific financial implications or could not be quantified in this study. Specifically, the companies benefited from:

- **Operational efficiency derived from empowering business users through self-service**. Interviewees appreciated Snowflake's integrated platform that delivered user-friendly, self-service business capabilities to secure data and manage user access. The VP of a financial institution described it as, "[A] clear presentation layer to manage data and easily spin up/down new analytical environments when needed." While the director of a CPG firm said: "Snowflake lets business users better authorize access to data, easily create schemas, and share results. It made us popular and has improved user satisfaction scores."
- **Flexibility to work across multiple cloud platforms.** Snowflake's platform supports a multicloud strategy, including a cross-cloud approach to mix and match various clouds. This gave interviewees the flexibility to implement workloads in different cloud environments and remove the risk associated with their dependency on just one cloud provider.
- **High satisfaction with Snowflake's account team.** Interviewees proactively praised Snowflake's support. The manager of a software company said, "The Snowflake account team support has been fantastic." The director of a CPG firm said, "Snowflake has been generous to allocate resources to explain functionality."
- **Improved client retention.** Snowflake helped the interviewed software companies improve their product offerings, which ultimately drove client satisfaction and engagement. These companies were better positioned to retain their clients by getting their hands on granular, time-relevant, and client-specific data; this was not possible in the prior platform. They had a better understanding of the specific client journeys and were able to identify the client's challenges and quickly address them. The chief product officer of a software company said, "We can help our customer understand their user engagement patterns, and they derive good value from that." They continued by saying how they could improve decision support by, "Rapidly addressing new and different data needs than earlier (siloed universe)." Garnering fresh insights on the usage of the business application (e.g., telemetric data) informed the team's product design. The chief product officer added, "This has positively impacted our clients and helped retain them."
- **Reduced downtime.** Interviewees appreciated not having to schedule downtime for making updates to the Snowflake platform. This reduced the time and effort needed for the interviewees' IT teams to handle change management procedures. Additionally, the business users enjoyed the perks of the system being available throughout their organization.

Business and data teams operated in a more efficient manner as they were empowered to through Snowflake's self-service capabilities and access to new data sets.

- **Improved ability to monitor risk and react quickly.** Interviewees could better monitor compliance and risk through Snowflake. The platform could ingest different data sets and process them quickly to deliver spot anomalies. The director of a CPG firm explained: “We wanted to protect our factory workers during the [COVID-19] pandemic. The management wanted a consolidated absentee’s report of all the factory workers and the reason for their illness. Using Snowflake, we could systematically load the data from the various tracking systems and delivery it to business quickly.” Another interviewee leveraged the report to monitor risk and credit policies and assess friction points in the sales funnel.

Flexibility

The value of flexibility is clearly unique to each customer, and the measure of its value varies from organization to organization. There are multiple scenarios in which a customer might choose to implement Snowflake and later realize additional uses and business opportunities, including:

- **Extending Snowflake to support additional use cases.** Interviewees initially leveraged Snowflake to support their data warehouse use cases (workloads). They saw value in the product and planned to extend it to support more use cases. The manager of a software company said: “We are now open to other workloads. Better performance delivered in a cost-effective way gives us more confidence to develop additional products.” The VP of a financial institution said, “After the success of our first implementation, we are now branching out Snowflake for other business purposes.” The interviewee was planning to leverage data science and elements of data engineering workloads.

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

Flexibility, as defined by TEI, represents an investment in additional capacity or capability that could be turned into business benefit for a future additional investment. This provides an organization with the “right” or the ability to engage in future initiatives but not the obligation to do so.

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
Ftr	Due diligence, implementation, deployment, and ongoing management	$686,400	$686,400	$343,200	$343,200	$2,059,200	$1,851,888
Gtr	Snowflake costs	$0	$302,500	$453,750	$680,625	$1,436,875	$1,161,364
	Total costs (risk-adjusted)	$686,400	$988,900	$796,950	$1,023,825	$3,496,075	$3,013,252

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 more than $3.0 million.

Due Diligence, Implementation, Deployment, And Ongoing Management

Interviewees dedicated time and resources to Snowflake starting from the vendor evaluation process. They conducted a hands-on due diligence process by creating a mock environment and running similar queries across multiple participating vendor platforms. From there, they moved into implementation and deployment, and finally into ongoing management. Effort varied across the stages, but many tasks were fluid, cutting across phases and repeating as interviewees launched new workloads or expanded into new business units. Tasks included:

- **Due diligence.** Most of the interviewees dedicated internal resources to building prototypes and evaluating the Snowflake platform alongside other participating vendor platforms. The interviewees loaded data, ran queries, and measured the performance and output. The interviewed companies selected Snowflake after a multidimensional evaluation process that included cost, performance and scalability, security, DevOps, self-service, etc. A software company took six months, while a CPG company took four months.
- **Implementation.** Resources implemented the Snowflake platform, building the connectors and transforming and loading data, etc. The implementation was done in a phased manner; starting with an initial pilot deployment to support a single use case and a limited set of users. Once the test results were satisfactory, the platform was extended to broader user teams and new use cases were implemented. The scale, timeline, and number of resources deployed for the implementation, varied across the interviewees. The financial institution dedicated three to four full-time data engineers and took one month to set up a pilot. This interviewee said, “Snowflake stood up the environment for us.” Another interviewee, a software company, dedicated three full-time resources (two data engineers and one engineering tester) and took 10 months to complete the pilot. Of which one month was spent loading the raw events data, three to four months were spent working on the schema and structure of the data. This involved activities such as sizing, resourcing allocation, and tuning. The manager said, “The platform was tuned to generate the query response in a few minutes down from a few hours during the initial setup.”

- **Ongoing maintenance.** This involved maintenance-related activities to supporting ongoing evolutions across both the business and the deployments of new workloads. The chief product officer of a software company said, “Maintaining Snowflake is no real burden.” While the director of a CPG firm said, “There is zero maintenance for the Snowflake platform, including the cloud environment, but we have four resources for production support purposes.” Similarly, the VP of a financial institution mentioned, “We have five to six resources to provide support.”

For the composite organization, Forrester made the following assumptions:

- The composite organization had eight full-time resources for a period of six months to support due diligence, implementation, and deployment.
- The composite organization had four full-time resources across Year 1 to support further product development and maintenance support. Subsequently, two full-time resources were considered for Years 2 and 3 to provide production support.
- The average fully loaded salaries for these resources were $156,000 each.
- The ongoing monitoring and maintenance of the platform, including upgrades and patching would be done by Snowflake.
- The full-time resources factored for product support govern the platform and address queries or concerns from the business users.

Forrester recognizes that these costs will vary based on:

- The scope and timelines of the due diligence and pilot implementation.
- The scale, complexity, and usage of the Snowflake platform, e.g., number of users, size of data, use cases leveraged, workloads.

To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV of $1,851,888.

Implementation risk is the risk that a proposed investment may deviate from the original or expected requirements, resulting in higher costs than anticipated. The greater the uncertainty, the wider the potential range of outcomes for cost estimates.

Due Diligence, Implementation, Deployment, And Ongoing Management: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
F1	FTEs dedicated to supporting Snowflake	Based on interviews	8	4	2	2
F2	Average fully loaded salaries	Industry average	$156,000	$156,000	$156,000	$156,000
F3	Months of the year dedicated		6	12	12	12
Ft	Due diligence, implementation, deployment, and ongoing management	F1*F2*F3/12	$624,000	$624,000	$312,000	$312,000
	Risk adjustment	↑10%				
Ftr	Due diligence, implementation, deployment, and ongoing management (risk-adjusted)		$686,400	$686,400	$343,200	$343,200

Snowflake Costs

The Snowflake costs are comprised of a combination of the workload, data volume and users. The interviewees tracked user utilization based on the credit units issued by Snowflake.

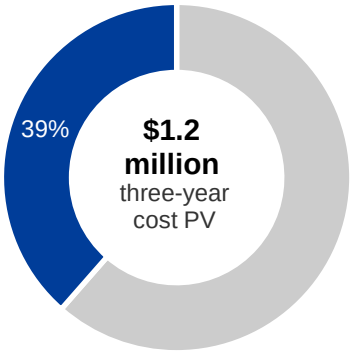
- Several interviewees stated that they planned to increase their spend on Snowflake to support more use cases or do analytics. A financial institution gradually increased its spend on Snowflake by 15% average year over year.

For the composite organization, Forrester assumes it pays $275,000 in Year 1, $412,500 in Year 2, and $618,750 in Year 3.

Forrester recognizes that these costs will vary based on:

- The workload selected for the Snowflake platform.
- The size and scale of the deployment.
- The extent to which analytics is performed within the organization.
- User adoption. Increasing consumption requires more of Snowflake's credits, which drives up cost. Some interviewees noticed the higher consumption in credits than planned because of their ability to do more with the new data sets not available in the previous platform.

To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV of $1,161,364.



Snowflake costs: **39%** of total costs

Implementation risk is the risk that a proposed investment may deviate from the original or expected requirements, resulting in higher costs than anticipated. The greater the uncertainty, the wider the potential range of outcomes for cost estimates.

Snowflake Costs: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
G1	Fees paid to Snowflake			$275,000	$412,500	$618,750
Gt	Snowflake costs	G1	$0	$275,000	$412,500	$618,750
	Risk adjustment	↑10%				
Gtr	Snowflake costs (risk-adjusted)		$0	$302,500	$453,750	$680,625

Other Costs To Consider

The interviewed companies noted other activities that apply to most data warehouse deployments such as implementing connectors, deploying analytical tools, and training. These were not quantified as part of this study.

- **Data Connectors.** The interviewees stated that a sizable portion of the implementation effort was in developing the connectors to integrate the downstream systems with Snowflake. While the developers of the interviewed companies were able to setup and configure the Snowflake platform quickly, they spent a significant amount of time developing the connectors.
- **Business intelligence tools.** Most of the interviewed companies had implemented business intelligence tools on top of Snowflake to perform analytical tasks. They continue to pay for these licenses with Snowflake.

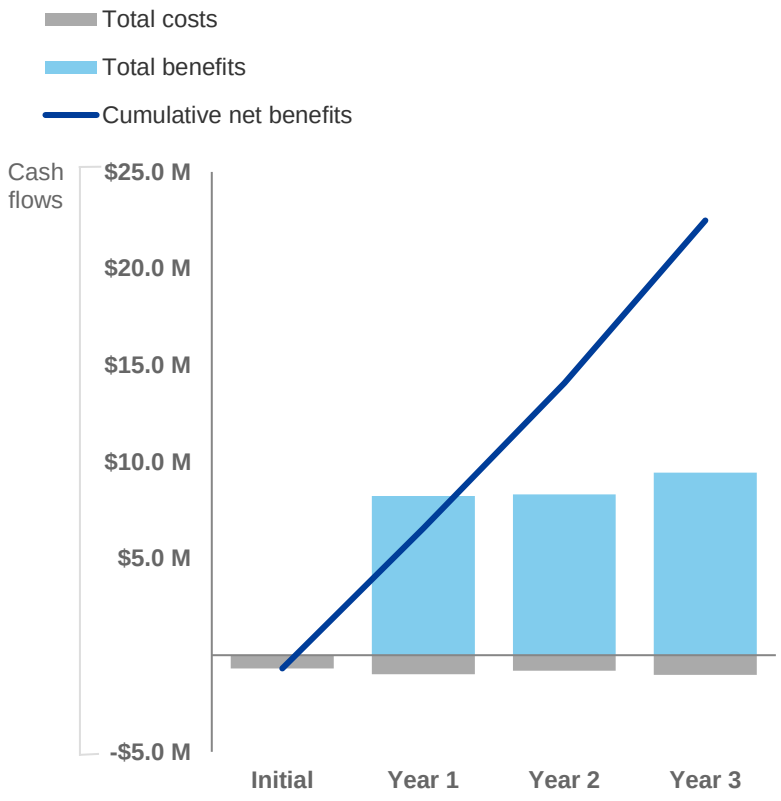
FORRESTER®

› **Training.** While most organizations trained employees, most did not witness any significant training costs. The director of a CPG firm said: "Four of our resources went to the Snowflake summit, which had outstanding presentations and explanation of functionalities. Post that, they did a full-day, deep-dive, [and] hands-on Snowflake certified program."

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 and NPV for the composite organization's investment. Forrester assumes a yearly discount rate of 10% for this analysis.

These risk-adjusted ROI and NPV 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	($686,400)	($988,900)	($796,950)	($1,023,825)	($3,496,075)	($3,013,252)
Total benefits	$0	$8,234,145	$8,315,012	$9,435,609	$25,984,766	$21,446,610
Net benefits	($686,400)	$7,245,245	$7,518,062	$8,411,784	$22,488,691	$18,433,358
ROI						612%

FORRESTER®

Snowflake's Cloud Data Platform: Overview

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

Snowflake's cloud data platform shatters barriers that have prevented organizations of all sizes from unleashing the true value from their data. Thousands of customers deploy Snowflake to advance their businesses beyond what was once possible by deriving insights from their data by all their business users. Snowflake equips organizations with a single, integrated platform that offers the data warehouse built for the cloud; instant, secure and governed access to their network of data; and a core architecture to enable many types of data workloads, including a single platform for developing modern data applications. Snowflake: Data without limits. Find out more at Snowflake.com.

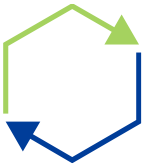
Appendix A: Total Economic Impact

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.