The Total Economic Impact™ Of MemSQL

Cost Savings And Business Benefits Enabled By The MemSQL Database

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Table Of Contents

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Executive Summary

MemSQL provides a highly scalable, relational database solution that helps its customers manage a high throughput of transactions as well as store and analyze big data. MemSQL commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying MemSQL. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of MemSQL on their organizations.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed four MemSQL customers. Previously, they all faced data issues; their database solutions were not able to keep up with transaction flow and/or were reaching storage scale and performance limits.

With MemSQL, organizations could avoid legacy database solution software and hardware costs. Customers provided several examples of business benefits achieved by using MemSQL to ingest a larger flow of transactions, store more data, and summarize and report on that data much quicker. These examples include:

› Analyzing data to predict and proactively deal with business-critical hardware failures.

› Tracking real-time transaction data to identify and avoid potential fraud and waste.

› Completing analysis processes faster, allowing employees to complete work faster and at a higher quality.

› Leveraging a database that not only ingests and stores more information but allows for much faster reporting and analysis to better identify opportunities and inform business decisions.

To facilitate analysis, Forrester combined customer interview results into a composite organization that is representative of the experiences of those interviewed companies. This composite organization is a global enterprise of 15,000 employees operating several lines of business, including software development and hardware manufacturing and sales, as well as providing consulting services.

Key Findings

Quantified benefits. The following three-year, risk-adjusted present value (PV) quantified benefits are based on the composite organization that is representative of interviewed companies' experiences:

› **Reduced legacy database software and hardware costs between $1 million to $3 million per year.** The composite organization, based on interview results, avoids between $1 million and $3 million each year in legacy database software and hardware costs. Specifically, the organization avoids license fees and hardware replacement cost — or reuses these retired resources in other areas of the business — adding up to a PV of $4.1 million over three years.

ROI
298%

Benefits PV
$15.0
million

NPV
$11.3 million

› **Reduced hardware issues, avoiding 25 business-critical failures.** The composite organization uses data and analytics not only to identify hardware nearing the time for service or replacement, but also to ingest, store, and analyze usage and results data. This allows the organization to proactively identify devices — such as servers and internet-of-things-connected (IoT-connected) devices — that may require maintenance or replacement before a major issue occurs. Identifying and avoiding an issue such as a server failing during peak business time helps the organization avoid an estimated 25 business-critical failures over three years, which adds up to a PV of $5.4 million.

› **Avoided fraud-related costs.** The composite organization also uses MemSQL to quickly ingest and monitor transactions to analyze billing and invoicing data for potential fraud or waste. The organization has identified fraud losses to be in the tens of millions each year and has set an organizational goal to reduce fraud costs by $2.5 million in the first year, $5 million in the second, and $10 million per year by the third year. While MemSQL has significantly enabled this initiative, there are other business changes that help avoid fraud costs. Estimates of fraud-related avoided costs enabled by MemSQL add up to a PV of $2.2 million.

› **Improved employee productivity in managing reports and analysis by 25%.** Before MemSQL, reporting and data-analysis processes could take hours or days. Today, reports not only include more data than before but take employees an hour or less to complete. This means employees working in data-intensive roles spend less time checking analyses for errors and can more quickly rerun reports if there are mistakes or different views to examine. This saves an estimated 25% of time conducting data-analysis and reporting tasks and enables users to provide higher-quality information and insights to colleagues and clients. The value of improved productivity adds up to a PV of $2.4 million over three years.

› **More informed decisions leading to new revenue and margin.** With MemSQL, the composite organization can keep up with fast transaction and log feeds, ingest and store more data, and analyze that data more quickly. This helps not only with the specific use cases identified above, but across many other revenue-generating areas of the business. Managers and executives are often able to take advantage of opportunities more quickly and can make more informed (and thus likely more profitable) decisions for the business. Over three years, just a 0.1% improvement in total revenue adds up to a PV of more than $895,000.

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

› **Product and service quality.** MemSQL allows the organization to manage a higher throughput of transaction upserts, meaning it can store more transactions and/or more information per transaction than before. Additionally, MemSQL delivers faster data processing and analysis for their business intelligence (BI) tools. This all means that employees have more data available more quickly and have more time to conduct follow-up analyses (for example, to examine a specific region or segment). As a result, they can deliver higher-quality results to colleagues, managers, partners, and clients.

Costs. The interviewed organizations highlighted the following cost categories, quantified here with risk-adjusted PV costs for the composite organization based on those interviews experienced:

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> › **Ongoing costs.** Annual costs include MemSQL software licensing, other hardware vendor costs and software support, and some third-party assistance. MemSQL is licensed as on-premises software based on the amount of server or node capacity. Some management and support costs are included for hardware and other software, and the composite organization has maintained some third-party assistance to help with data and application management. Ongoing costs add up to a total PV of $3.1 million.

> › **Implementation costs.** The composite organization implemented MemSQL over 16 months at an estimated cost of about $646,000. Costs include upfront software license fees and hardware purchase costs, as well as an average of 2.5 FTEs assigned throughout the implementation period working on planning, testing, development, data migration, application development, and other associated tasks.

Forrester's interviews with four MemSQL customers and subsequent financial analysis found that a composite organization based on these interviews experienced benefits of $15.0 million over three years versus costs of $3.7 million, adding up to a net present value (NPV) of $11.3 million and an ROI of 298%.

Benefits (Three-Year)
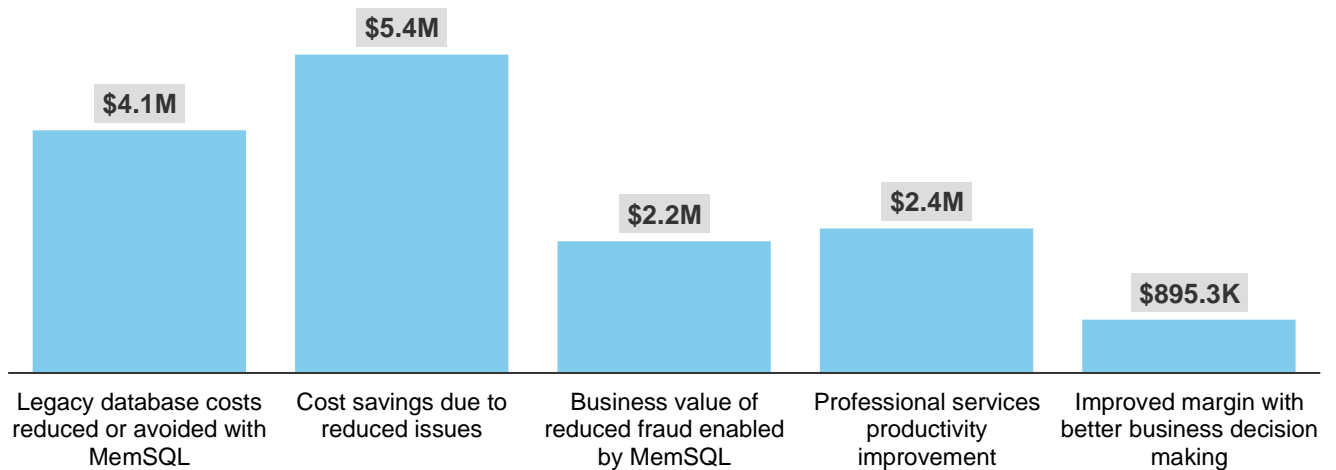
$4.1M	$5.4M	$2.2M	$2.4M	$895.3K
Legacy database costs reduced or avoided with MemSQL	Cost savings due to reduced issues	Business value of reduced fraud enabled by MemSQL	Professional services productivity improvement	Improved margin with better business decision making

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 MemSQL.

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 MemSQL 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 MemSQL stakeholders and Forrester analysts to gather data relative to MemSQL.

CUSTOMER INTERVIEWS
Interviewed four organizations using MemSQL 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 MemSQL'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.

DISCLOSURES

Readers should be aware of the following:

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

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

MemSQL 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.

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

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The MemSQL Customer Journey

BEFORE AND AFTER THE MEMSQL INVESTMENT

Interviewed Organizations

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

INDUSTRY	REGION	INTERVIEWEE	DETAILS
Online services	Global; US-based	Principal architect	2M upserts per second Tables with 250B to 400B rows
Professional services	Global; US-based	Data engineering director	1 MemSQL cluster supports all (separate and secure) client databases
Utilities	Midwest United States	Data and integration enterprise architect	9 TB of columnstore data in its MemSQL database
Online security services	Western United States	Data engineer	240,000 upserts per second 7 TB data stored

Composite Organization

Based on the interviews, Forrester constructed a TEI framework, a composite organization, and an associated ROI analysis that illustrates the areas of a business financially impacted by MemSQL. 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:

Composite Global Software, Hardware, And Services Firm

Description of composite. The composite organization is a global company that develops software and hardware solutions and provides support and consulting services to augment its product portfolio. The organization has the following characteristics:

› Employees: 15,000.

› Revenue: $3 billion USD.

› Operating margin: 15%.

› Estimated avoidable business-critical failures each year: 25.

› Employees in data-analysis roles: 750.

› Planned fraud-reduction initiative goals: $2.5 to $10M for the first three years, with higher goals after.

› Total data stored in MemSQL databases: about 8TB.

Deployment characteristics. Planning and deployment for MemSQL took about 16 months. During that time, the organization migrated data over to the new MemSQL solution, changed data integration connections, and began using it in production. As MemSQL supports the

Key assumptions
15,000 employees
$3 billion revenue USD
Global software, hardware, and services focus

> "The biggest headache with our legacy solution is the cost and the scalability."
>
> *Data engineer, online security services*

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standard SQL database language, formatting, training, ramp-up, and application code changes were minimized.

Key Challenges

Interviewed organizations identified a number of issues with their previous database platforms, including:

› **Databases couldn't keep up with throughput.** The previous databases could not keep up with the flow of information due to scalability limitations. Instead, the interviewed organizations would simply not store all information, meaning valuable content was being thrown away.

› **Performance limits were approaching.** Each organizations' data storage, processing power, and memory were reaching maximum capacity and would require expensive scale-out efforts to add more databases and servers to keep up.

› **Prospects for expanding the legacy database platforms were costly.** More databases and powerful servers would incur significant costs and require more resources — already a difficult proposition. "The biggest headache with our legacy solution is the cost and the scalability," said a data engineer at an online security services firm.

› **Analyses took hours or days to complete.** Running a data-analysis process or report could take up to 12 hours, or sometimes multiple days. "We've been able to perform calculations in 2 minutes that used to take an hour; a large report used to take 5 to 6 hours, and now, it takes 30 minutes," said the principal architect at an online services firm. While that didn't mean an employee was exclusively working on this task, significant time was still required for checking on any errors, reviewing results, and rerunning analyses that had errors or issues. These extra tasks could all lead to significant delays in the value gained from using data.

› **Fraud was difficult to manage.** Existing platforms were not suited to the fast analysis needed for proactive fraud analysis.

› **Many hardware issues could have been prevented.** Current analytic performance was unable to properly identify and prevent hardware failures to deliver desired proactive service experience. But the issue was known, and organizations wanted to reduce what appeared to be avoidable outages caused by hardware failures. The principal architect for an online services company explained, "If we have an incident, then we're two days behind."

Solution Requirements

The interviewed organizations searched for a solution that could:

› Operate at the speed and scale they needed.

› Enable the ingestion and storage of even more data.

› Complete data-analysis and reporting processes quickly.

› Enable new opportunities to leverage data in other areas of the business.

Interviewed organizations selected MemSQL and began deployment:

> "A large report used to take 5 to 6 hours, and now, it takes 30 minutes."
>
> *Principal architect, online services*

> "If we have an incident, then we're two days behind."
>
> *Principal architect, online services*

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- Implementation took about 16 months, from planning to full replacement of old database platforms in production.
- The process involved migrating existing data to MemSQL.
- Some organizations, such as the online security services firm, were able to transition from the old platform to the new platform in a short time, without other employees or clients even noticing.
- MemSQL databases can ingest and store more information with less database instances than with the previous solution.

Key Results

The interviews revealed that key results from the MemSQL investment include:

- **Reallocation or retirement of legacy database solutions.** Departments leveraging MemSQL were able to reduce or completely replace several legacy database and analysis platforms. This meant that license costs, service contract costs, and some hardware-related costs could be reduced or completely avoided, either as license agreements came to an end or as other groups in the organization retooled these solutions for their own needs. Additionally, since MemSQL supports the SQL database query language, no new database or development resources were required. "SQL language support was a key reason for purchase," the data engineering director at a professional services company remarked.

- **Business process improvements.** The interviewed organizations identified specific processes and use cases where MemSQL has enabled value, including:

  - Taking advantage of MemSQL's fast data-analysis features to complete analysis and reporting tasks more quickly. These features also allow employees the time to conduct more "what if" analyses to ensure results are complete and accurate.
  - Using its large stores of data for predictive modeling to identify and proactively repair hardware that is more likely to have issues for proactive repair or replacement, thus avoiding costly business-critical failures. "That gets into the millions of dollars in benefit to the company," said the data engineering director at a professional services company.
  - Analyzing large stores of transaction data to resolve any past issues and also identify and mitigate potential fraud or errors.

- **Greater scope and scale of data available for analysis, enabling organizations to provide additional value-added services.** MemSQL can support the speed of new content for upsert, meaning some data that was ignored before, such as location data, can now be kept and leveraged in data analysis and related services.

- **Better decision making.** Beyond the three highlighted use cases, business managers and executives now have access to more data that can be analyzed faster, meaning decisions and responses to opportunities are more informed and can be completed more quickly.

"SQL language support was a key reason for purchase."
Data engineering director, professional services

"[Proactive maintenance] gets into the millions of dollars benefit to the company."
Enterprise architect, utilities

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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	Legacy database costs reduced or avoided with MemSQL	$850,000	$1,700,000	$2,550,000	$5,100,000	$4,093,539
Btr	Cost savings due to reduced issues	$2,160,000	$2,160,000	$2,160,000	$6,480,000	$5,371,600
Ctr	Business value of reduced fraud enabled by MemSQL	$400,000	$800,000	$1,600,000	$2,800,000	$2,226,897
Dtr	Professional services productivity improvement	$979,688	$979,688	$979,688	$2,939,063	$2,436,338
Etr	Improved margin with better business decision making	$360,000	$360,000	$360,000	$1,080,000	$895,267
	Total benefits (risk-adjusted)	**$4,749,688**	**$5,999,688**	**$7,649,688**	**$18,399,063**	**$15,023,641**

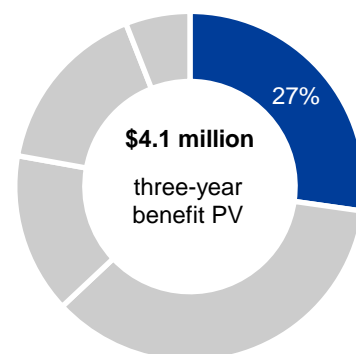## Legacy Database Costs Reduced Or Avoided With MemSQL

With the deployment of MemSQL, the composite organization reduced its legacy database platform investment — especially as the new MemSQL implementation requires fewer database instances. With the MemSQL distributed architecture and memory- and disk-optimization, the storage of more data in a single database instance without performance issues or limits is increased. MemSQL's distributed architecture also means that databases can be run from a network of commodity servers at a lower total cost than the premium servers that were required.

Before MemSQL, the composite organization was not collecting and storing all data that was available. It had met the limit of its database's ingest capabilities, and some noncritical data — for one interviewed customer, this included location data — was ignored. With MemSQL, ingest is significantly greater — for another interviewed customer, by as much as 4x greater.

Overall, the interviewed organizations have found:

› MemSQL meets and even exceeds data ingest requirements. Organizations are now ingesting and storing more information than they were before. A principal architect at an online services firm said, "In MemSQL, we've ingested data quicker."

› Fewer database instances are required, simplifying some management tasks, application code, and analysis functions — as well as reducing total database license costs. Legacy databases were often not only more expensive per license, but more licenses were required. "There is much more data — literally an order of magnitude more — than we

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 $15.0 million.

$4.1 million

three-year benefit PV

27%

Legacy database costs reduced or avoided with MemSQL: **27%** of total benefits

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were able to store in a database before," explained the principal architect at an online services firm.

› Data center management needs are reduced (for organizations that have on-premises solutions versus cloud). While the infrastructure still includes many database and storage servers, these are run on commodity hardware that require no extra tools or knowledge to manage. "Previously, scaling had to be done manually, and that was terrifying and time-consuming from an engineer's point of view," said the data engineer at an online services firm.

With these improvements, Forrester estimates the following cost savings for the composite organization since implementing MemSQL:

› Avoided legacy database platform costs, including database licenses, other analysis tool software, specialty hardware, and other related costs, totaling as much as $3 million per year.

The interviewed organizations had volume license agreements in place for legacy software, as well as for hardware support. Some legacy database and analysis tools remained in use for some tasks and departments, and others were able to be repurposed by other departments, (which would otherwise have purchased new licenses).

Given these factors, Forrester estimates that of the $3 million total potential benefit, the composite realizes one-third in Year 1, two-thirds in Year 2, and the full amount in Year 3.

However, estimating the actual amount saved by retiring legacy platforms is challenging, as:

› Retirement may be phased over time.

› License agreements may vary.

› The potential for reuse by other departments can also vary.

To account for these risks, Forrester adjusted this benefit downward by 15%, yielding annual cost savings of $850,000 to $2.55 million for a three-year, risk-adjusted present value (PV) of nearly $4.1 million.

> Legacy database platform costs would have been as much as an estimated $3 million per year in added costs for the composite organization.

Impact risk is the risk that the business or technology needs of the organization may not be met by the investment, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for benefit estimates.

Legacy Database Costs Reduced Or Avoided With MemSQL: Calculation Table					
REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
A1	Annual database legacy platform cost		$3,000,000	$3,000,000	$3,000,000
A2	Portion of legacy solution database licensing avoided since MemSQL		1/3	2/3	100%
At	Legacy database costs reduced or avoided with MemSQL	A1*A2	$1,000,000	$2,000,000	$3,000,000
	Risk adjustment	↓15%			
Atr	**Legacy database costs reduced or avoided with MemSQL (risk-adjusted)**		**$850,000**	**$1,700,000**	**$2,550,000**

Cost Savings Due To Reduced Issues

MemSQL enables proactive issue management for hardware in business-critical situations, particularly with features such as fast ingest and fast query response. "One of our key use cases for MemSQL is

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being able to predict when a device is about to fail," remarked the enterprise architect for a utilities company.

Before, the composite organization experienced critical hardware failures, such as an eCommerce server crashing and a product manufacturing robot falling outside standard parameters. For example, for one interviewed organization, the energy company, this meant electrical transformers — just a single hardware failure could mean significant business impact when neighborhoods experience electricity blackouts.

Some customers may have been unable to complete a purchase, or an assembly line might have been halted. And if many devices failed at once, the scope could have been much larger.

Often, a business-critical failure happened at the worst possible time. Stressed systems collapsing during peak work or shopping hours meant a greater amount of people were affected.

For the utilities company, the timing was often even worse, as a transformer failure is more likely to happen during adverse weather, when customers need their heaters and air conditioners to stay comfortable and safe.

With MemSQL, the utilities company leveraged the vast amounts of data, ingested from network logs, IoT-connected devices, and other monitoring data sources, to run analysis reports quickly to identify devices that are sending unusual readings or are otherwise not interacting normally with other devices.

The composite organization can create a support ticket to test and fix or replace a problematic server or schedule maintenance for other monitored devices for the next immediately available downtime or nonpeak time.

$5.4 million

three-year benefit PV

36%
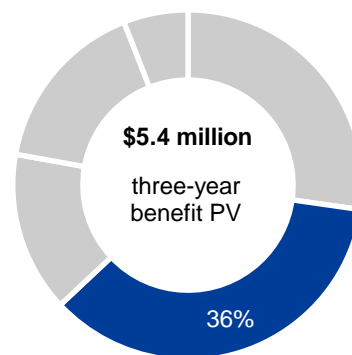
Cost savings due to reduced issues: **36%** of total benefits

Cost Savings Due To Reduced Issues: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
B1	Avoidable business-critical failures (yearly)		15	15	15
B2	Failure duration (hours)		1	1	1
B3	Avoided business-critical issues attributable to MemSQL		80%	80%	80%
B4	Cost of an hour of outage		$200,000	$200,000	$200,000
Bt	Cost savings due to reduced issues	B1*B2*B3*B4	$2,400,000	$2,400,000	$2,400,000
	Risk adjustment	↓10%			
Btr	**Cost savings due to reduced issues (risk-adjusted)**		**$2,160,000**	**$2,160,000**	**$2,160,000**

For the composite organization, Forrester assumes that:

› Avoidable business-critical issues related to hardware add up to about 15 total servers or devices each year. Though total business-critical failures are likely much higher, this total represents those hardware issues that can be avoided with proactive maintenance or replacement.

› A device failure duration is 1 hour.

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› Some failures that are now avoided are due to other factors, such as the implementation of a more frequent maintenance schedule. Of these failures that have been avoided, 80% are due to data analysis enabled by MemSQL.

› The cost of an hour of outage is $200,000.

The reduction of avoidable issues (and related costs) will vary with:

› The cost per event; the provided estimate is highly dependent on the organization, its business focus, and its customers.

› The number of events and time per event; these are also organization specific.

To account for these risks, Forrester adjusted this benefit downward by 10%, yielding annual avoided issue cost savings of $2.2 million, which adds up to a three-year risk-adjusted total PV of $5.4 million.
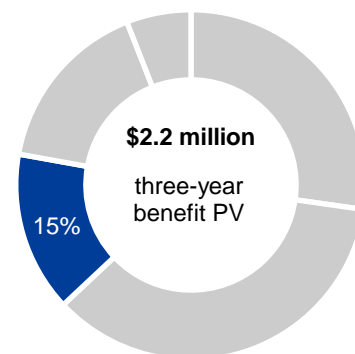
Business Value Of Reduced Fraud Enabled By MemSQL

One of the interviewed organizations reported that using the increased amounts of data and faster data analysis helped to better identify and avoid fraudulent, mistake-based, or wasteful transactions. Predictive analysis can help proactively avoid, or at least review, questionable transactions. Additionally, fast and large-scale analysis and reporting can help identify past problem transactions that the organization can work to recover or review and learn from to avoid similar situations in the future.

The composite organization has implemented an organizational strategy to reduce the amount of annual fraud and waste by a set amount each year: $2.5 million in the first year, working up to $10 million by the third year, with even higher goals in future years. "We've got a plan for reducing theft each year, and we are on target for realizing these goals," said an enterprise architect for a utilities company.

MemSQL is a key factor in planning and implementing this effort, but as a broad campaign, more than just data analysis is involved — including process changes, best practices implementation, internal compliance and audit task improvements, and other services and technologies. Forrester estimates the attributable impact of MemSQL on reducing fraud and waste to be 20%.

Many business-critical failures can be avoided with proactive data analysis.

$2.2 million

three-year benefit PV

15%

Business value of reduced fraud enabled by MemSQL: **15%** of total benefits

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
**Value Of Reduced Fraud Enabled By MemSQL**					
C1	Expected fraud improvement strategy impact (rounded)		$2,500,000	$5,000,000	$10,000,000
C2	Percentage of fraud reduction attributable to MemSQL		20%	20%	20%
Ct	Business value of reduced fraud enabled by MemSQL	C1*C2	$500,000	$1,000,000	$2,000,000
	Risk adjustment	↓20%			
Ctr	**Business value of reduced fraud enabled by MemSQL (risk-adjusted)**		**$400,000**	**$800,000**	**$1,600,000**

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However, the future fraud and waste goals may be overestimated, especially in the second and third years. To account for these risks, Forrester adjusted this benefit downward by 20%, yielding annual benefits of $400,000 to $1.6 million for a three-year risk-adjusted total PV of $2.2 million.

Professional Services Productivity Improvement

All interviewed organizations highlighted data-analysis and reporting process efficiencies. For some people, this was an occasional task; for others it was more common. For the employees at the professional services firm, it was a primary team focus. Overall, all organizations shared issues they experienced before MemSQL, including:

› Analysis or reporting processing time often took hours or even days.

› While processing time does not equate to total work time, the longer the process took, the more time employees spent checking on progress.

› Longer processing also meant a higher incidence of errors or failures, meaning employees would spend time restarting the process.

› If a report or analysis was run with incorrect assumptions or inputs, employees had to restart the process.

With MemSQL, the composite organization can run analyses and reports quickly:

› Processing time is just a few minutes, up to an hour for larger reports.

› This shorter processing time means there's less need for periodic check-ins.

› Shorter processing time also means there's less chance of failures. Even if failures occur just as often, there's still plenty of time to restart.

› If a report or analysis is run incorrectly, there's time to fix and rerun it. This also creates opportunities for value-added services for colleagues and clients. Faster report completion can often mean there's time to run additional reports focused on specific segments or other "what if" analysis parameters.

For the composite organization, Forrester estimates:

› There are 750 employees in roles that require frequent data analysis using data stored in MemSQL databases — such as employees providing professional services to clients of their organization. The average salary for this group is $110,000.

› Before MemSQL, these employees spent about half a day (4 hours) per week setting up, running, and troubleshooting data reports and analyses.

› MemSQL reduces this time by 25%, or about 1 hour per week.

As a standard practice, Forrester adjusts all broad productivity time savings by 50%, because not all time saved is spent on work-related tasks. Also, as the amount of time saved may be overestimated, Forrester adjusted this benefit downward by 5%, yielding annual benefits of $980,000, which add up to a three-year risk-adjusted total PV of $2.4 million.

16%

$2.4 million

three-year benefit PV
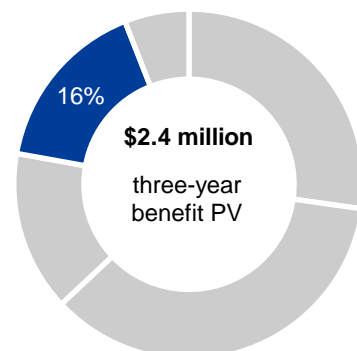
Professional services productivity improvement: **16%** of total benefits

Faster data analysis is estimated to enable a 25% productivity improvement.

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REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
D1	Number of employees in roles that require regular MemSQL data analysis and reporting		750	750	750
D2	Professional services resource time spent on data analysis and reporting tasks		10%	10%	10%
D3	Productivity improvement with MemSQL data speed and depth		25%	25%	25%
D4	Average annual salary for professional services resources		$110,000	$110,000	$110,000
D5	Standard productivity realization factor		50%	50%	50%
Dt	Professional services productivity improvement	D1*D2*D3* D4*D5	$1,031,250	$1,031,250	$1,031,250
	Risk adjustment	↓5%			
Dtr	**Professional services productivity improvement (risk-adjusted)**		**$979,688**	**$979,688**	**$979,688**

Improved Margin With Better Business Decision Making

The interviewed organizations highlighted even more opportunities they have gained with the volume and speed of data they achieve with MemSQL. Examples include new service offerings, identifying and acting on a business opportunity, and use cases in other departments similar to the fraud and issue avoidance cases identified above. As a way to measure the value of these benefits for the composite organization, Forrester has estimated the impact of better decision making on total revenue and margin.

The composite organization has annual revenues of $3 billion. Forrester estimates a 0.1% improvement in revenue, enabled by MemSQL in situations such as:

› Using data stored in MemSQL databases to implement new services. For example, one organization did not capture location data before MemSQL; with MemSQL, it now stores location data along with everything else related to the stored event. This organization has added that to its services as a new, value-added feature.

› The ability to ingest and store more data and analyze it more quickly. This better informs managers and executives, to help identify and take advantage of profitable opportunities (as well as avoid costly mistakes).

› Faster data retrieval, analysis, and reporting for the organization, which can also help its customers. Several interviewed organizations use MemSQL to manage, analyze, and prepare billing reports to send to business or consumer customers along with other information, such as a warning that the current bill might be higher compared to past consumption. "At the end of the month, a customer would ask, 'I budgeted to pay you a thousand dollars, but I used a lot more than expected and now I'm paying you $10,000. But why didn't you warn

Better business decision making can enable value such as:

· Developing new products.
· Delivering more customer services.
· Profiting on opportunities.

$895,267

three-year benefit PV

6%
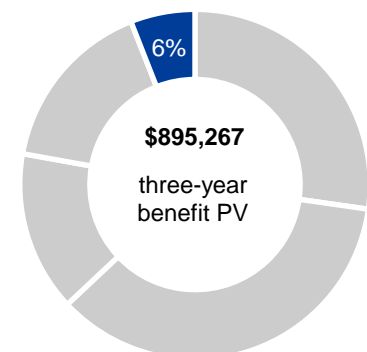
Improved margin with better business decision making: **6%** of total benefits

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me earlier?'" said the principal architect for an online services firm. This can improve customer satisfaction and help customers more accurately plan their budgets.

As broad estimates, the amount of revenue improvement attributable to MemSQL can vary greatly, depending on an organization's need for new services, what business opportunities arise, and what other use cases are available. To account for this, Forrester adjusted this benefit downward by 20%, yielding annual benefits of $360,000, for a three-year risk-adjusted total PV of more than $895,000.

Improved Margin With Better Business Decision Making: Calculation Table					
REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
E1	Total revenue		$3 billion	$3 billion	$3 billion
E2	Improvement with MemSQL		0.1%	0.1%	0.1%
E3	Operating margin		15%	15%	15%
Et	Improved margin with better business decision-making	E1*E2*E3	$450,000	$450,000	$450,000
	Risk adjustment	↓20%			
Etr	**Improved margin with better business decision-making (risk-adjusted)**		**$360,000**	**$360,000**	**$360,000**

Unquantified Benefits

In addition to the financial measurements above, MemSQL databases have enabled greater value that is either very difficult to quantify or has not yet been quantified by the interviewed customers. These benefits include the following:

› Greater data collection and analysis mean organizations can deliver greater value to their customers. "There is a value in assessing trends, and we can help them find the right direction," explained the data engineer for an online security services firm, highlighting how storing more data with faster data analysis enables additional data and professional services that can be provided to its customers.

› Similarly, greater data collection enables organizations to have more historical data more readily available, meaning analyzing trends, such as year-over-year analysis, do not require special data access, and are thus more common.

Flexibility

The value of flexibility, Forrester's term for identifying and quantifying future solution options made available given the work and experience gained to date, is clearly unique to each customer The measure of its value varies from organization to organization. The MemSQL customers interviewed have identified some additional uses and business opportunities, including:

› **Expanding the use of MemSQL to other data use cases.** Some organizations highlighted use cases such as predictive analytics and transaction monitoring — but more is planned. For example, one organization is piloting a customer-billing dashboard that provides greater transparency and information — where much of the information

> 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.

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that the organization can see about a customer will become available for each customer to view as well. This can help them plan more effectively and open more cross-sales opportunities; it is much more effective to show a customer how their activity would be better suited for a different service plan versus just trying to tell them in a sales pitch. "Now that we are able to speed up the ingest of our data, we can calculate billing and other data for our customers quicker," said the principal architect for an online services firm.

› **Expanding current MemSQL data use cases.** Separately, though related, organizations plan to expand on what they are already doing. For example, one organization uses data stored in MemSQL databases as part of its fraud-monitoring efforts. With added data analytics and business rules, and the ingest of data from more sources, the organization has set fraud-prevention goals for several years beyond the three-year analysis period — goals set at $10 million per year and more — for a potential annual benefit of $1.6 million or more per year in years 4 and beyond.

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

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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	Ongoing costs	$1,050,000	$1,176,000	$1,149,750	$73,500	$3,449,250	$3,124,519
Gtr	Implementation costs	$645,750	$0	$0	$0	$645,750	$645,750
	Total costs (risk-adjusted)	**$1,695,750**	**$1,176,000**	**$1,149,750**	**$73,500**	**$4,095,000**	**$3,770,269**

Ongoing Costs

Ongoing costs associated with an investment in MemSQL include:

› **MemSQL license costs.** Organizations have the option to pay software license fees (which are based primarily on total nodes) upfront. The composite organization, like the majority of interviewed organizations, has opted to spread payments over the three years — though these payments are made in advance of the year licensed, so payments are made during the initial period, in Year 1, and in Year 2. Ongoing MemSQL licensing and support fees continue in future years, though for this three-year analysis, because a payment in Year 3 would apply to benefits realized in Year 4, a Year 3 payment is not added.

› **Maintenance and support fees**, for other software and hardware.

› **Other third-party support and development services**, as needed for specific applications or data connects. This is expected to go down in later years.

Internal database and other IT resources are not included in this analysis. For all interviewed organizations, there was no significant change in the number of resources required to manage databases and develop and support-related applications.

> 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 about $3.7 million (with rounding for summarization purposes).

Ongoing Costs: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
F1	MemSQL licensing and support costs		$1,000,000	$1,000,000	$1,000,000	
F2	Server and storage maintenance costs			$20,000	$20,000	$20,000
F3	Third-party support and services			$100,000	$75,000	$50,000
Ft	Ongoing costs	F1+F2+ F3	$1,000,000	$1,120,000	$1,095,000	$70,000
	Risk adjustment	↑5%				
Ftr	**Ongoing costs (risk-adjusted)**		**$1,050,000**	**$1,176,000**	**$1,149,750**	**$73,500**

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As MemSQL supports standard SQL language queries, there wasn't even any change in team resources or skill sets, though some tasks certainly evolved. "We could take our existing SQL developers and DBAs (database administrators) to stand this environment up and not have to worry about support or management resources," stated an enterprise architect for a utilities company. The same people supporting the legacy system managed more databases, while with MemSQL they support fewer database instances but with more business opportunities to use data.

Maintenance and third-party fees in particular may be underestimated, so Forrester has adjusted this cost upward by 5%, yielding ongoing costs of about $1.2 million per year, adding up to a three-year risk-adjusted total PV of about $3.1 million.

Implementation Costs

Implementation for the composite organization took about 70 weeks (or about 16 months), and the costs associated with this implementation of MemSQL include:

› **Storage hardware and software costs**. The MemSQL implementation includes the ingest and storage of more data than before, which requires some new storage servers and the software to manage them.

› **Third-party consulting and support**. The composite organization brought in some outside assistance to help with some implementation-related tasks, such as data integration and application development.

› **Internal resource time.** This is the largest portion of the upfront investment necessary to complete implementation tasks, such as: planning, testing, installing and setting up the MemSQL database; developing connections and interfaces; and migrating data.

To allow for underestimated implementation costs estimates, Forrester adjusted this cost upward by 5%, yielding a total implementation cost of about $646,000.

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.

Sixteen months
Total implementation and deployment time

Implementation Costs: Calculation Table						
REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
G1	Storage hardware costs		$100,000			
G2	External implementation consulting and support		$200,000			
G3	Internal resource FTE for implementation		2.5			
G4	Implementation time (weeks)		70			
G5	Average FTE hourly rate		$45			
Gt	Implementation costs	G1+G2+(G3* 40*G4*G5)	$615,000	$0	$0	$0
	Risk adjustment	↑5%				
Gtr	**Implementation costs (risk-adjusted)**		**$645,750**	**$0**	**$0**	**$0**

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Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)

Total costs

Total benefits

Cumulative net benefits

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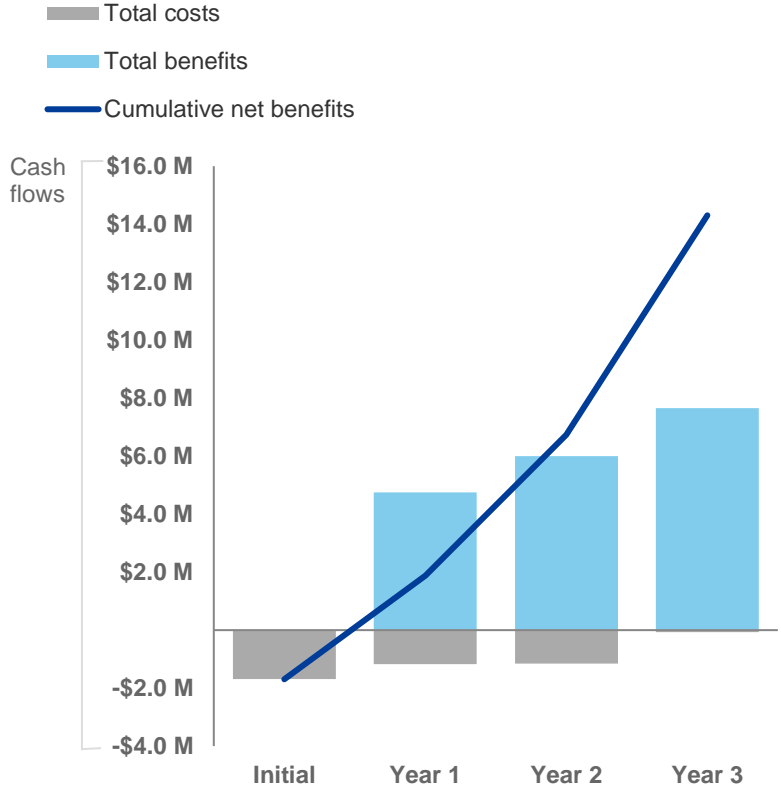
The financial results calculated in the Benefits and Costs sections can be used to determine the ROI and NPV for the composite organization's investment. Forrester assumes a yearly discount rate of 10% for this analysis.

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	($1,695,750)	($1,176,000)	($1,149,750)	($73,500)	($4,095,000)	($3,770,269)
Total benefits	$0	$4,749,688	$5,999,688	$7,649,688	$18,399,063	$15,023,641
Net benefits	($1,695,750)	$3,573,688	$4,849,938	$7,576,188	$14,304,063	$11,253,372
ROI						298%

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MemSQL: Overview

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

BUILT FOR MODERN APPLICATIONS & ANALYTICAL SYSTEMS

MemSQL is an incredibly fast, infinitely scalable, distributed relational SQL database. Built for the demands of modern applications and analytical systems, MemSQL easily ingests large volumes of data while simultaneously delivering sub-second queries for tens of thousands of concurrent users. Engineered for high-performance transactions and petabyte-scale analytics, MemSQL is the database that simplifies operational and analytic workloads with a single, easy-to-use system that runs on any cloud or commodity infrastructure.

MemSQL provides:

› A modern distributed architecture for limitless scale.

› Performance on industry-standard hardware.

› Deployment flexibility with an on-premises, hybrid, or multicloud option.

› Broad data type support including JSON, geospatial, and full-text search.

› High-performance stream ingestion with memory and disk-optimized tables for instant insights on the latest data.

› Standard relational SQL that seamlessly works with existing skills and systems.

For more information visit MemSQL.com.

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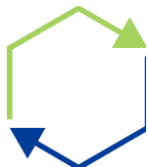
Flexibility represents the strategic value that can be obtained for some future additional investment building on top of the initial investment already made. Having the ability to capture that benefit has a PV that can be estimated.

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.

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