

Modern Dell EMC Storage And Data Protection Optimize SAP Workloads And S4/HANA Migration

Executive Summary

To deliver new value and enable innovation, organizations are striving to build intelligent enterprises that run on insight from data delivered in real time. The transition can be challenging especially in this digital era. Enterprises are accumulating increasing volumes of data, yet they struggle to identify what data is relevant and how to manage the data they are collecting. Success hinges on the way an enterprise uses data to transform it into data capital and the way the organization invests in data technology.

Many organizations utilize SAP enterprise software to manage their data capital; however, as of 2025, SAP software will run on only one database, SAP HANA. This deadline and the desire to leverage SAP's next-generation applications, including artificial intelligence and machine learning, are driving enterprises to migrate to SAP HANA and SAP S/4HANA.

Dell EMC and Intel commissioned Forrester Consulting to conduct a market survey and a Total Economic Impact™ (TEI). The purpose of the study is to evaluate key challenges, drivers, benefits, and costs of migrating to SAP HANA and SAP S/4HANA and determine Dell EMC's overall impact in delivering value against those factors.

MARKET SURVEY — MIGRATION CHALLENGES AND BEST PRACTICES

To gather insights on the state of organizations migrating to SAP HANA and SAP S/4HANA, Forrester surveyed 550 global IT decision makers (ITDMs) and enterprise resource planning (ERP) application owners at enterprises that have either implemented or are in the process of implementing SAP HANA and are at least planning to implement SAP S/4HANA.

Survey responses suggest the migration is not without its challenges, such as high costs, cloud migration issues, storage availability for applications and data, and struggles to maintain control over the environment. Organizations pursued a variety of approaches and best practices to smooth the migration, but when we asked respondents in hindsight to choose the approaches they wished they had taken, three of the top four answers revolved around making additional investments in storage and data protection.

The impact that modernized IT infrastructure had on the success of SAP HANA migrations is summarized in the following observation from the survey:



Firms that modernized their IT architecture prior to the migration rated their top business benefits 50% to 80% higher than those that didn't.

SUMMARY

Based on a commissioned study, "The Total Economic Impact Of Dell EMC Infrastructure For SAP"

METHODOLOGY

The objective of the TEI 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 of Dell EMC Storage & Data Protection for SAP HANA & S/4HANA, including interviews with Forrester analysts, Dell EMC stakeholders, and six current Dell EMC customers. Forrester constructed a financial model representative of the interviews using the TEI methodology. Forrester also surveyed 550 global ITDMs and ERP application owners at enterprises implementing SAP HANA and SAP S/4HANA.

COMPOSITE ORGANIZATION

This analysis uses a composite organization, based on the interviewees, to present the aggregate financial analysis.

RISK ADJUSTMENT

Forrester risk-adjusted the financial model based on issues and concerns of the interviewed organizations to account for uncertainties in benefit and cost estimates.

TEI RESULTS FOR COMPOSITE ORGANIZATION

To better understand the benefits, costs, and risks associated with investments in storage and data protection, Forrester interviewed six Dell EMC customers with experience migrating workloads to SAP HANA and SAP S/4HANA. Each of the interviewed customers transitioned to a modern IT architecture designed to deliver high-speed performance, scalable business architecture, and integrated security. In addition, customers found that Dell EMC Storage and Data Protection enabled them to better align their enterprises around the generation of data capital — a collection of digital assets that drive value for an organization.

Through these customer interviews and subsequent data aggregation, Forrester developed a representative composite organization and concluded that Dell EMC Storage & Data Protection has the following three-year financial impact: \$7 million in benefits versus costs of \$1.8 million, resulting in a net present value (NPV) of \$5.2 million, a payback of less than three months, and an ROI of 289%.



Benefits \$7 million, present value



Costs \$1.8 million, present value



Payback <3 months



ROI 289%

Quantified benefits

Forrester modeled the \$7 million of benefits for the composite organization based upon the storage and data protection experiences shared by the Dell EMC customers interviewed. Forrester calculated all benefits over three years and adjusted for the risk or uncertainty of outcomes. The top five benefits were as follows:



Improved efficiency of business operations valued at \$2.4 million.



Increased speed of development worth over \$1.2 million.



Avoided errors and inconsistencies of global invoicing processing valued at \$990,855.



Reduced operating cost of continuing to use previous storage solution of \$874,057.



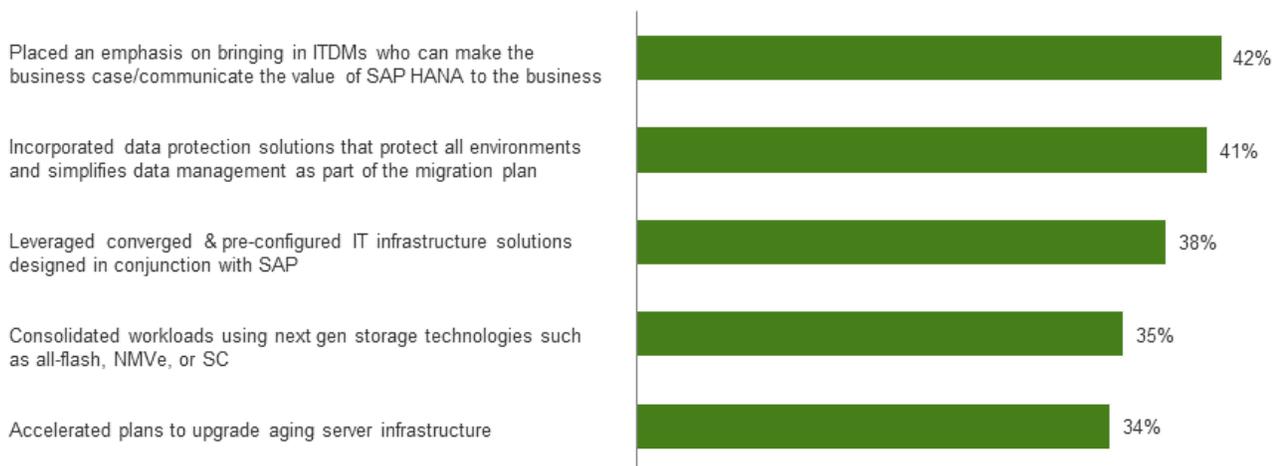
Reduced wait time for end users to complete compute jobs valued at \$844,597.

IT Modernization's Role In Your SAP Journey

VOICE OF THE MARKET

Survey responses suggest the migration is not without its challenges, such as high costs, cloud migration issues, storage availability for applications and data, and struggles to maintain control over the environment. We asked respondents to identify the approaches or best practices taken to smooth the transition to SAP HANA, and their top choices were: upgrading aging server infrastructure, incorporating SAP application owners in the planning process, identifying business partners with SAP vertical expertise, and incorporating data protection solutions that simplify data management. When we asked respondents in hindsight to choose the approaches they wished they had taken, three of the top four answers revolved around additional investment in storage and data protection.

“Which of the following infrastructure best practices or approaches do you wish your organization had taken for your SAP HANA migration in hindsight?”



Base: 316 Global ITDM and ERP application owners at enterprises that either have implemented, are implementing HANA, or plan to implement S/4HANA.
Source: A commissioned study conducted by Forrester Consulting on behalf of Dell EMC, July 2019

To better understand the role that IT modernization plays in a successful migration to SAP HANA and SAP S/4HANA, Forrester examined survey responses segmented by an organization's IT maturity. Firms categorized as high IT maturity generally embrace software-defined data center technologies, widely deploy data protection solutions, automate management tasks, modernize their storage facilities, and use converged and/or hyperconverged infrastructure platforms. At the other end of the spectrum, low-maturity firms operate with a more traditional IT infrastructure.

The contrast in benefits recognized between enterprises with modern versus traditional IT architecture underscores the importance of this best practice. SAP migration experiences turned out to be highly correlated with a firm's infrastructure maturity. The firms classified as highly mature and invested to modernize their IT rated their top business benefits 50% to 80% higher than firms with low infrastructure maturity.

“What business benefits have you realized or would you expect to realize as a result of your migration to S/4HANA?”



Base: 550 Global ITDM and ERP application owners at enterprises that either have implemented, are implementing, HANA, or plan to implement S/4HANA. Source: A commissioned study conducted by Forrester Consulting on behalf of Dell EMC, July 2019

The Value Of Dell EMC Storage & Data Protection For SAP HANA

For the TEI study, Forrester conducted six interviews with Dell EMC customers. Interviewed customers include the following:

INDUSTRY	INTERVIEWEE	REGION	PRIOR CHALLENGES
Public university	Executive director	North America	Wanted to prepare for coming technologies such as SAP HANA.
Sports equipment company	Vice president, information technology	Headquartered in North America with global operations	Struggled with long runtimes for key SAP business processes and shrinking windows of time for making system changes.
Service provider	Director, cloud services	Europe	Received more requests from internal SAP users for enhanced cloud solutions and robust security capabilities.
Software vendor	Director, cloud infrastructure	North America	Needed the most efficient and cost-effective way to standardize SAP databases and applications for the internal cloud services being built by the IT organization.
Beverage products	SAP administrator leader	Global	Wanted to expedite SAP HANA database backups and recovery time.
Food products	Data center operations manager	North America and Asia	Struggled with storage, performance, and backup reliability for SAP HANA and S/4 HANA workloads.

Key Investment Drivers And Results

The interviewed Dell EMC customers shared the following factors for their storage and data protection investments to support SAP HANA and S/4 HANA:

- › **Decrease system downtime.** Due to the 24x7 nature of business, business executives mandated that IT administrators compress the windows set aside for system updates and changes.
- › **Reduce storage complexity.** Organizations pursued a strategy to standardize on a single technology platform and thereby simplify storage administration, backup, disaster recovery, and consistency in global data center management.
- › **Improve agility, cost controls, and reduce business risk.** In response to these objectives, ITDMs expressed the need for a solution that integrates a multicloud approach with on-premises solutions.
- › **Changing business dynamics.** Organizations needed a scalable storage solution that enabled them to invest in their data centers in a manner that was consistent with their overall business strategy.

The interviewed organizations achieved key business and IT benefits as a result of their investments in modern storage and data protection for SAP:

- › **Elevated levels of reliability and resilience.** The service provider executive told Forrester: “When we first deployed Dell EMC as our storage partner, it elevated our typical level of resilience. In fact, it reset our expectations, and in the coming years, we have grown to expect the same level of resilience in the products of our other partners. Today, our conversations with Dell EMC focus on emerging services, time-to-market, strategies, cloud interfaces, and real-world problems.”
- › **Improved productivity of information technology and business unit professionals.** The service provider executive told Forrester: “Previously, we had runtimes that would extend into the following day, delaying the work of people when they arrived the next morning. Now the jobs are complete every morning, and people can focus on managing daily tasks or growing new business instead of waiting.” The sports equipment executive added, “We have seen an average reduction of runtimes of 50% to 60% between the Dell EMC technology and SAP HANA database upgrades.”
- › **Demonstrated the higher performance with SAP HANA and eased future migration.** The sports equipment executive said: “When we originally looked at storage vendors, the performance difference was minor. They were all competitive. We then decided to test the storage with HANA, and Dell EMC stood out as a better performance and more reliable technology. Choosing Dell EMC simplified our company’s migration to SAP HANA.”

“We have seen an average reduction of runtimes of 50% to 60% between the Dell EMC technology and SAP HANA database upgrades.”

Vice president, information technology, sports equipment



Dell EMC Storage And Data Protection Unlocks The Power Of SAP To Generate Data Capital

COMPOSITE ORGANIZATION

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an ROI analysis that illustrates the areas financially affected, covered in greater detail in the full study. The composite organization has the following characteristics:

- › Used several SAP modules including Advanced Planner and Optimizer (APO) and ERP Central Component (ECC).
- › Started with 400 TBs of storage installed and grows 20% annually.
- › Managed operations globally.

DETAILED TEI RESULTS FOR COMPOSITE ORGANIZATION

The customers interviewed by Forrester modernized their IT infrastructure with Dell EMC Storage and Data Protection Solutions. The customers chose Dell solutions to simplify their data landscape and enable a smooth migration to SAP HANA and SAP S/4HANA. After implementation, the customers noted an improvement in performance and speed, a reduction in data errors, greater data availability, and continuous protection.

Over three years, the composite organization achieved risk-adjusted present value (PV) total benefits of \$7 million.

Total Benefits					
BENEFIT	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Improved efficiency of business operations	\$960,000	\$960,000	\$960,000	\$2,880,000	\$2,387,378
Avoided errors and inconsistencies of global invoicing processing	\$398,438	\$398,438	\$398,438	\$1,195,313	\$990,855
Reduced wait time for end users to complete compute jobs	\$339,625	\$339,625	\$339,625	\$1,018,875	\$844,597
Increased speed of development	\$484,500	\$484,500	\$484,500	\$1,453,500	\$1,204,880
Improved productivity of storage administrators	\$73,440	\$151,470	\$151,470	\$376,380	\$305,747
Improved productivity of managing disaster recovery	\$91,800	\$91,800	\$91,800	\$275,400	\$228,293
Reduced cost of continuing to use previous storage solution	\$380,000	\$305,900	\$367,080	\$1,052,980	\$874,057
Reduced cost of power and cooling for data center	\$56,100	\$56,100	\$56,100	\$168,300	\$139,512
Total benefits (risk-adjusted)	\$2,783,903	\$2,787,833	\$2,849,013	\$8,420,748	\$6,975,319

- › **Improved efficiency of business operations.** Before the upgrade to Dell EMC infrastructure powered by Intel® Xeon® Scalable processors, a single run of SAP APO required 32 hours. After upgrading, a run took 7 hours — moving 4.5x faster. The shorter runtime allowed one interviewed company to run APO every night instead of every weekend, which enabled decision makers in procurement, logistics, and manufacturing facilities to make better and faster decisions.
- › **Avoided errors and inconsistencies of global invoicing processing.** Before using Dell EMC Storage and Protection Solutions for SAP, extract-transform-load (ETL) loads for a global company were taking almost 24 hours. These delays were causing mistakes. After implementation, ETL loads for invoicing decreased to 10 hours, which allowed more for accurate data and reduced errors.
- › **Reduced wait time for end users to complete compute jobs.** Improved storage performance accelerated the runtime of many other activities across the composite organization. Specifically, business users often found that the runtime of many workloads was reduced significantly, which improved their productivity. This resulted in the savings equivalent to 27.5 full-time equivalents (FTEs) over an annualized basis.
- › **Increased speed of development.** Interviewed customers told Forrester that faster storage improved the productivity of their development teams by an average of 5%.
- › **Improved productivity of storage administrators.** PowerMax and XtremIO are easier to manage than the traditional storage platforms. Interviewees reported that it took fewer FTEs to manage the same capacity. In the model, the composite organization has a total of six storage administrators whose shared workload was reduced by 33% using with the new storage systems.
- › **Improved productivity of managing disaster recovery.** Improved storage reduced the workload required to manage disaster recovery. The impact was the equivalent to 1.2 FTEs, saving \$102,000 per year.
- › **Reduced cost of continuing to use previous storage solution.** Continuing to use the previous storage system would have cost 15% more than the replacement system, for a total savings of \$1.3 million.
- › **Reduced cost of power and cooling for data center.** The new storage system required less square footage in the data center and reduced the cost of power and cooling by 300,000 watts per year.

Unquantified benefits

The interviewed organizations experienced the following benefits, which are not quantified but should be considered as part of their evaluation:

- › **Confidence in the resiliency of Dell EMC Storage & Data Protection.** After successfully delivering on their service-level agreements (SLAs) and disaster recovery (DR) tests, the interviewees felt confident that they could ensure availability from core to edge to cloud. This resiliency is partially attributed to the incorporation of Intel Xeon Scalable processors, which provide hardware-enhanced advanced levels of reliability, availability, and serviceability.
- › **On-premises solutions for critical applications.** By deploying a preconfigured/prevalidated converged solution for SAP HANA and SAP S/4HANA such as VxBlock powered by Intel, interviewees improved performance and availability, as well as their overall data security.

“Our previous environment was a struggle every day. We struggled from a storage perspective and a performance perspective. We struggled with ensuring that our backups were meeting our SLAs, and even whether we actually would be able to do a restore. When we purchased Data Domain, we fell in love with the product, bought another Data Domain, and then started replicating out.”

Data center operations manager, food company



“Prior to the Dell EMC solution, we didn’t really have the confidence that in a disaster, we would be able to recover our production environments. Now we have the confidence that we would be able to handle a situation like that.”

Data center operations manager, food products



- › **Strategic partnerships with Dell EMC professional services.** Interviewees shared that Dell EMC was a trusted partner that assisted with the migration by ensuring that infrastructure was optimized to their SAP HANA and SAP S/4HANA workloads.
- › **Scalability of the solution.** Interviewees shared that with Dell EMC Storage & Data Protection built on Intel, new use cases and technologies can be extended into SAP HANA and S/4HANA without the need for reconfiguration or upgrades to the infrastructure. For example, Intel Optane® DC persistent memory, a new storage class memory technology, is a feature that delivers new performance benefits and helps future-proof the PowerMax solution. The ability to deliver the benefits of consistently improved service scalability on-premises and to the public cloud with higher virtual machine and container density is especially helpful for replication and disaster recovery.

“Dell EMC is a strategic partner for us. They are one of the few vendors that actually comes out on a regular basis, listens to either our business goals or the problems that we’re having, and then turns that around into solutions that are both cost-effective and work well for us.”

Computer hardware, CTO and chief architect



Dell EMC Storage & Data Protection For SAP Costs Include Fees And Implementation Costs

The composite organization experienced two categories of cost associated with its Dell EMC investment. Over three years, the organization achieved risk-adjusted PV total costs of \$1.8 million.

Total Costs

COST	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Cost of Dell EMC storage	\$0	\$1,400,000	\$280,000	\$336,000	\$2,016,000	\$1,756,574
Cost to implement and configure storage	\$35,700	\$0	\$0	\$0	\$35,700	\$35,700
Total costs (risk-adjusted)	\$35,700	\$1,400,000	\$280,000	\$336,000	\$2,051,700	\$1,792,274

- › **Cost of Dell EMC storage.** The composite organization paid Dell EMC a total of nearly \$1.8 million over three years for a capacity that began at 400 TBs in Year 1 and grew to 576 TB by Year 3.
- › **Implementation and configuration.** The composite organization employed three FTEs who spent 50% of their time over three months planning and implementing the storage transition.

Dell EMC Storage & Data Protection For SAP HANA And S/4HANA Investment Today Can Create Future Opportunities

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 Dell EMC Storage & Data Protection for SAP HANA & S/4HANA and later realize additional uses and business opportunities, including:

- › **Ease of future S/4HANA upgrades.** The food products executive told Forrester, “The infrastructure that we’re on now has already put us in the position where we don’t have to worry about any future restraints or restrictions from the asset view side and what their hardware requirements are going to be.”
- › **Building internet-of-things (IoT) strategies.** The service provider executive looking to leverage IoT data told Forrester: “We are working with Dell EMC to understand how we can have more data endpoints and leverage Dell EMC to collect, aggregate, and integrate device management beyond just its own technology. We want to manage IoT devices the same way that we manage Dell EMC storage.”
- › **Increased view of the data protection environment.** With the automated monitoring, analysis, and reporting on backup and recovery, infrastructure administrators are better positioned to manage service levels and, if necessary, take corrective action to optimize performance in the future.

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.

CONCLUSION

Enterprise decision makers understand the importance of their most valuable capital asset — their data. As such, organizations are investing heavily in migrating critical workloads to SAP HANA and SAP S/4HANA. This investment is driven by the 2025 end-of-service life for SAP applications that aren’t running on SAP HANA databases, but also by the need for improved business agility, risk mitigation, better user experience, and enhanced time-to-value.

This migration, however, is no small undertaking, with organizations identifying a series of challenges including high costs, cloud migration issues, storage availability for applications and data, and struggles to maintain control over the environment. Businesses took a variety of actions to facilitate their migrations, but when we asked respondents in hindsight to choose the approaches that they wished they had taken, three of the top four answers revolved around additional investment in storage and data protection.

The interviewed Dell EMC customers made the investment in IT modernization, partnering with Dell EMC for their migration to SAP HANA and SAP S/4HANA. The composite organization created from the combination of the results of all interviewed organizations generated financial benefits with a present value of \$7 million over three years and experienced a 289% ROI. All of this suggests that the Dell EMC customers increased the value of their SAP data capital and are positioned to generate a new collection of digital assets in the future.

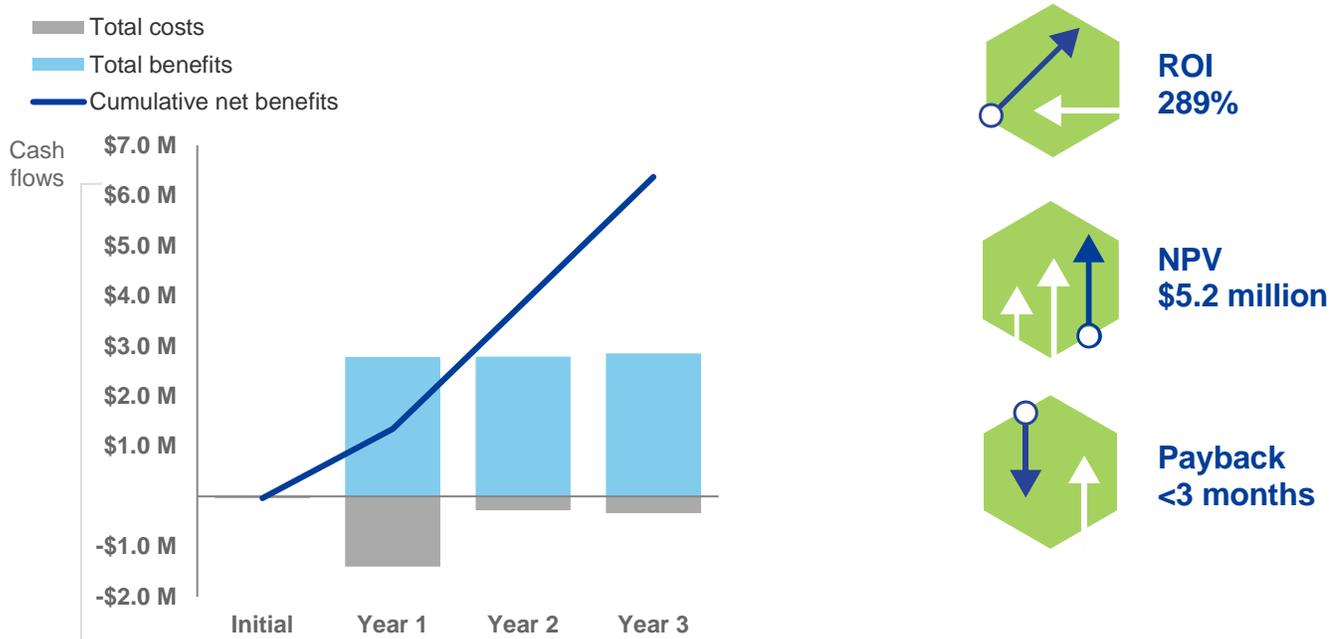
- › For more information, download the full Dell EMC for SAP TEI analysis [here](#).

This study was commissioned by Dell Technologies and Intel.

- › To learn more about Dell Technologies Storage & Data Protection Solutions, please visit [here](#).
- › To learn more about Intel Optane® DC Persistent Memory, please visit [here](#).
- › To learn more about Intel SAP data center solutions, please visit [here](#).

Financial Summary

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



Disclosures

The reader should be aware of the following:

The study is commissioned by Dell EMC and delivered by Forrester Consulting. It is not meant to be 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 Dell EMC for SAP.

Dell reviewed and provided feedback to Forrester. 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.

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

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. <https://go.forrester.com/consulting/>

ABOUT TEI

Total Economic Impact™ (TEI) 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. The

© 2019, Forrester Research, Inc. All rights reserved. Unauthorized reproduction is strictly prohibited. Information is based on best available resources. Opinions reflect judgment at the time and are subject to change. Forrester®, Technographics®, Forrester Wave, RoleView, TechRadar, and Total Economic Impact are trademarks of Forrester Research, Inc. All other trademarks are the property of their respective companies. For additional information, go to forrester.com.