

FORRESTER®

The Total Economic Impact™ Of Plex Smart Manufacturing Platform

Cost Savings And Business Benefits
Enabled By The Plex Smart Manufacturing Platform

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Executive Summary

With its cloud-based Smart Manufacturing Platform, Plex transforms manufacturers' understanding of their production processes and how to improve them. The product journey is captured on a transactional basis, permitting an in-depth analysis of the machine, people, and time that resources have utilized. The Plex Smart Manufacturing Platform puts warehousing, manufacturing, maintenance, and customer service on the same team in optimizing inventory management, production, and customer success.

Plex Systems commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying the [Plex Smart Manufacturing Platform](#).¹ The Plex Smart Manufacturing Platform includes applications for manufacturing execution system (MES), enterprise resource planning (ERP), quality, supply chain planning, the industrial internet of things, and analytics. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Plex on their organizations. Plex digitally transforms the operation and management of the manufacturing process in a cloud-based environment that highly integrates the organization to fully account for the transformation of raw material to the finished product.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed an organization with experience using Plex. Forrester used this experience to project a three-year financial analysis.

Prior to using Plex, the customer had a highly customized and antiquated on-premises material requirements planning (MRP) platform. The basic account of raw material input to the finished product output was known for both ends of the manufacturing process; however, significant effort was required to both record the transformation and to operationalize any efficiencies on the shop floor. The customer did not have a robust forecast ability to plan for future

KEY STATISTICS



Return on investment (ROI)
412%



Net present value (NPV)
\$4.25M

raw material needs around anticipated demand, creating costs in both inventory and late production. Even with the efforts to create and manage transactional data with manual input/manipulation, the customer had poor visibility into cost, waste, opportunities for operational improvement, and more timely and accurate decision-making. As such, the customer faced expenses and challenges in its older solution and manufacturing operation that affected its overall competitiveness.

After the investment in Plex, the customer was able to reduce or eliminate costs from IT, data/analysis, production waste, and late performance, which freed cash flow, permitted new investment, and ultimately lowered its production cost basis by 50%.

KEY FINDINGS

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

- **Lower cost of IT administration via Plex.** As a multitenant, cloud-based, and managed solution, Plex shifts administrative roles out of on-premises server support, backups, and desktop management while ensuring a contractually guaranteed 99.9% uptime. This was cited as saving two IT administration FTEs, which were redirected into analytical needs, and transforming the IT role into more of an active and more highly valued business analyst function. Over three years, lower IT administration costs were worth approximately \$412,000 to the organization.

“The old system was limited. There was no transactional data on the actual manufacturing piece, no visibility to forecast what we needed or fix where we were inefficient. Now we have a strong handle on how to model our costs and win new business.”

VP of IT and ERP, food manufacturer

- **Cost savings of paperless manufacturing process.** The production process proceeds through a full paperless quality system. Operators and managers conduct their various quality checks from an electronic standpoint, rather than having production assistants track by clipboard and paper; this also minimizes manual data input. This innovation redirected the work of two staff FTEs and saved \$223,000.
- **Saved FTEs to create transaction reports.** The electronic data acquisition afforded by Plex has also transformed the function of the existing business analyst group. Rather than spending time on data input and spreadsheet manipulation, the seven analyst FTEs were redirected to spend time on more valuable analytical tasks that: 1) improved operations and 2) created accurate

production cost models. The cost models have been instrumental in helping expand business development. This FTE savings was worth \$1,058,000.

- **Reduced inventory waste via improved production processes.** Plex allocates a precise amount of stock to production output and monitors each step in batch production and labeling. This is fundamental to catching errors/manufacturing variances both at the outset of production and during production processes to fix mistakes and avoid wasting inventory and material. This eliminated the 10% inventory waste factor that was experienced prior to the implementation of Plex. Eliminating inventory waste saved \$2,535,000 over the three-year period.
- **Cost savings from lower chargebacks due to late production.** The sequencing of customer production runs, including the planning and shipping of inventory was organized through Plex, resulting in 99% on-time rates. By dramatically reducing the chargebacks received for late production, \$1,057,000 in costs were saved prior to the implementation.

“Plex has eliminated the silos of warehousing, manufacturing, maintenance and customer service. With total visibility for everyone in the operation, it makes our goals crystal clear, because the timing and interdependencies of inventory, production, [and] maintenance to customer success are right there. And we’ve been amazingly successful since Plex.”

VP of IT and ERP, food manufacturer

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

- **Lean inventories.** The implementation of Plex DemandCaster Supply Chain Planning — to drive order lead time, production schedules, and batch lot allocation of inventory — permitted the customer to reduce its inventory allocation by 50% or \$13 million. This freed operating cash and reduced debt, which was not quantified as a benefit in the economic model, but it was nonetheless significantly positive for the pre-cash flow to be invested in plant improvements and potential acquisitions.
- **Organize and scale across different plants.** The forecast capability of DemandCaster allowed the customer to not only order inventory for different plants as one entity but to also apportion production to different plants as the shipment point. As such, the customer benefited from not having to order and manage inventory at separate sites, allowing it to realize economies of scale from ordering in larger quantities. This was also cited as making integration of future acquisitions easier.

“Plex gave us the ability to help drive product improvement. As a large food manufacturer, that is fundamentally important to our process and was a huge hole with our previous MRP.”

VP of IT and ERP, food manufacturer

- **Accurate cost models help expand profitable business.** A newfound understanding of the cost basis to production permitted the creation of accurate cost models for an array of different products where the organization had less

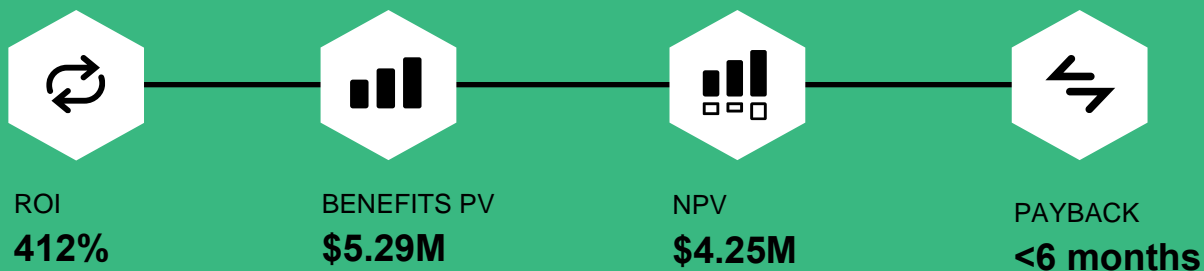
experience; this facilitated new business wins among large retailers.

- **Break down silos across warehousing, manufacturing, maintenance, and customer service.** New standard operating procedures (SOPs) were created and implemented as part of training done across departments. Additionally, the improved visibility of the manufacturing operation across the organization removed barriers and showcased the interdependency of these roles in efficient and on-time product delivery.

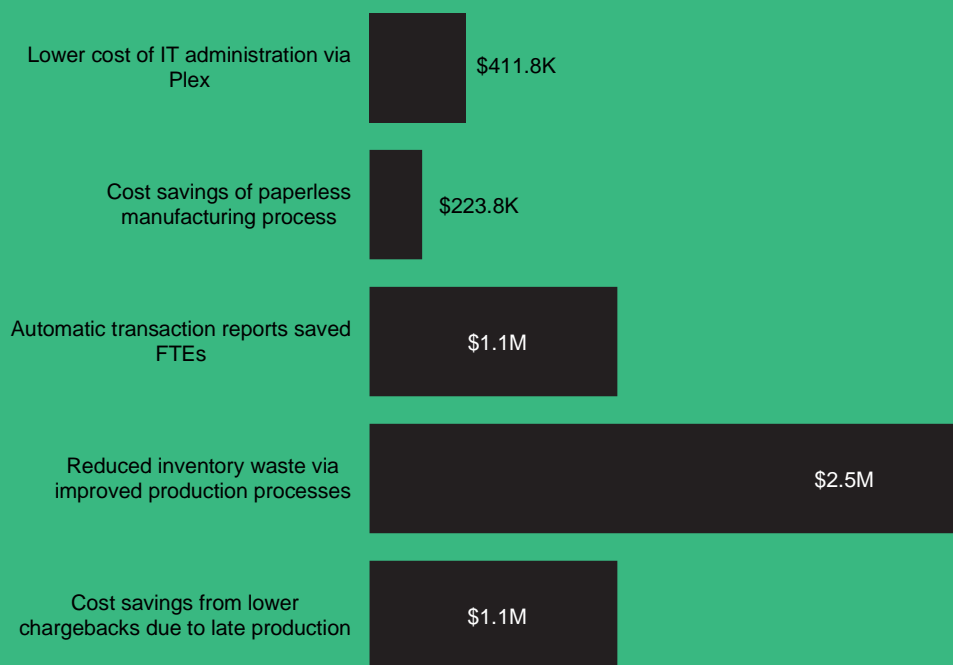
Costs. Risk-adjusted PV costs include:

- **Subscription cost of \$675,200 over a three-year period.** The Plex subscription model scales with the revenue growth that the customer experiences following implementation. Plex’s standard pricing includes unlimited users (including customers and partners), and thus the number of users is not tied to cost. In this instance, the customer’s subscription cost rose 50% over the three-year period. Also, following implementation, there was a 50% decline in the customer’s manufacturing cost.
- **Implementation cost of \$357,000 over a three-year period.** These costs included adding electronic data interchange (EDI) trading partners, the acquisition of supporting hardware, and the training and development of SOPs that utilized the Plex Smart Manufacturing Platform.

The interview and financial analysis found that this customer experiences benefits of \$5.29M over three years versus costs of \$1.03M, adding up to a net present value (NPV) of \$4.25M and an ROI of 412%.



Benefits (Three-Year)



There was a broad array of measurable benefits following the implementation of Plex.

Cost savings from the reduction of manufacturing waste and on-time production represent 68% of the total benefits.

TEI FRAMEWORK AND METHODOLOGY

From the information provided in the interviews, Forrester constructed a Total Economic Impact™ framework for those organizations considering an investment in Plex.

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 Plex can have on an organization.

DISCLOSURES

Readers should be aware of the following:

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

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

Plex 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.

Plex provided the customer name for the interview but did not participate in the interview.



DUE DILIGENCE

Interviewed Plex stakeholders and Forrester analysts to gather data relative to Plex.



CUSTOMER INTERVIEW

Interviewed one decision-maker at an organization using Plex to obtain data with respect to costs, benefits, and risks.



FINANCIAL MODEL FRAMEWORK

Constructed a financial model representative of the interview using the TEI methodology and risk-adjusted the financial model based on issues and concerns of the interviewed organization.



CASE STUDY

Employed four fundamental elements of TEI in modeling the investment impact: benefits, costs, flexibility, and risks. Given the increasing sophistication of ROI analyses related to IT investments, Forrester's TEI methodology provides a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

The Plex Smart Manufacturing Platform Customer Journey

■ Drivers leading to the Smart Manufacturing Platform investment

INTERVIEWED ORGANIZATION

Forrester interviewed a Plex Smart Manufacturing Platform customer with the following characteristics: less than \$300 million revenue, 450 employees, and 420 Plex users.

The customer organization benefits from their implementation and use of the cloud-based Plex Smart Manufacturing Platform, as it harmonizes each step of the manufacturing process from inventory, to production runs, to fulfillment. Plex tracks each step on a transaction basis to account for raw material inputs, manufacturing outputs, and machinery, time, and people resources used during production. With the cloud-based capability that Plex provides, the customer organization did not have to rely on IT staff to either build or run the operation. This was important as the platform expanded through acquisition.

KEY CHALLENGES

The customer organization had an overall need to transition to a more modern solution. Their existing production control system was antiquated, highly customized, and no longer supportable, which led to a host of business challenges.

The customer struggled with common challenges, including:

- **Stockpiled inventory to not run out of stock and miss production deadlines.** Balancing lean inventory and sufficient stock to meet production

“The inventory management capabilities brought by Plex have been a huge, huge win for us.”

VP of IT and ERP, food manufacturer

requirements, and not tie up unnecessary budget in a timely manner, was an ongoing challenge. This was particularly the case as the existing system did not have a forecast capability. Projections were developed from a straight-line sales history to build inventory. With this limited accuracy, the customer commonly kept too much inventory on hand to ensure order commitments and customer retention.

- **Poor visibility within the end-to-end manufacturing process.** Without a capability to readily generate transaction data within the end-to-end manufacturing process, there was significant effort required to track the bookends of raw materials in and finished goods out. This included line production recording by paper record and an inability to create useable data. In all, a significant effort in people resources was needed to create operational intelligence, but it did provide timely or widely visible intelligence for the customer organization.
- **A lack of visible production data allowed manufacturing inefficiencies to run unchecked.** The inability to discern production errors until later in the process led to wasted inventory, delays in production, and more extensive fixes in both machinery and service delivery. This resulted in customer service interventions to reorder schedules for pressing customer need as well as expedited shipping to help keep orders on time. With limited visibility to an end-to-end, and holistic view of performance, the warehousing, manufacturing, maintenance, and customer service components of the organization operated in siloes.

USE CASE DESCRIPTION

The customer organization first implemented the Plex Smart Manufacturing Platform in 2017; it followed up

with addition of the forecast application, Plex DemandCaster Supply Chain Planning, in 2019.

The end-to-end implementation took approximately one year, this included: the development of EDI trading partners, three months for training, and a one-month post-live phase for process modification and assessment. Additionally, the team acquired hardware (UI screens and printing equipment) and developed new SOPs, which opened the door for cross-departmental changes and improvements.

Training on Plex also included sessions and communication across departments. This, coupled with the creation of new SOPs indicating how the job is done, initiated conversations on the process of manufacturing, change, and improvement across departments. As Plex provides visibility of the end-to-end manufacturing process to all users, the interdependencies between manufacturing, maintenance, and customer service are finally showcased. In sum, the training and post-live phase for Plex implementation served to break down silos between departments.

Plex's digital, transactional model enabled the customer organization to understand the manufacturing process in granular detail, from inventory to finished product. This not only identified and filled in important operational intelligence holes, but it also allowed technical resources to move to more valuable analytical tasks.

The addition of DemandCaster allowed the customer organization to quantify the raw material

requirements for projected production to shipment timing, to ensure adequate supply and accurate timelines. By directly apportioning inventory to manufacturing, the customer organization permitted analysis of production line efficiency, identified production errors and machine variances to be fixed early in the process, and significantly reduced waste. In many ways, this helped sow the seeds for growth.

With greater operating efficiency, the customer organization was able to increase production some 250% with largely the same plant size and people resources. There were significantly reduced costs in IT management, inventory, and production. Its cost basis for production also fell 50%.

As the cost basis to production was also now understood in granular detail, this provided an understanding of how to price opportunities with existing and new customers, to win additional business.

“ Plex gives us the ability to look at things in a different way to plan for the future and improve upon it with insights we didn't have. ”

– VP of IT and ERP, food manufacturer

Analysis Of Benefits

■ Quantified benefit data

Total Benefits						
Ref.	Benefit	Year 1	Year 2	Year 3	Total	Present Value
Atr	Lower cost of IT administration via Plex	\$165,600	\$165,600	\$165,600	\$496,800	\$411,823
Btr	Cost savings of paperless manufacturing process	\$90,000	\$90,000	\$90,000	\$270,000	\$223,817
Ctr	Automatic Transaction Reports Saved FTEs	\$425,250	\$425,250	\$425,250	\$1,275,750	\$1,057,534
Dtr	Reduced inventory waste via improved production processes	\$1,020,000	\$1,020,000	\$1,020,000	\$3,060,000	\$2,536,589
Etr	Cost savings from lower chargebacks due to late production	\$425,000	\$425,000	\$425,000	\$1,275,000	\$1,056,912
Total benefits (risk-adjusted)		\$2,125,850	\$2,125,850	\$2,125,850	\$6,377,550	\$5,286,675

LOWER COST OF IT ADMINISTRATION VIA PLEX

Evidence and data. The on-premises management cost of backing up servers, network maintenance, and client computers is removed in a cloud-based environment.

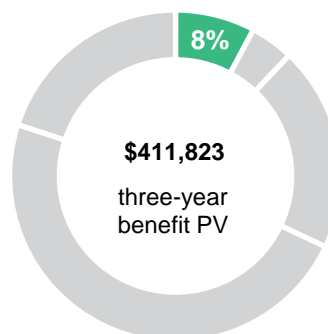
- The customer organization’s on-premises IT FTE commitment of 2.5 jobs was reduced to 0.5 following the implementation of Plex.
- The average burdened salary of IT administrator jobs within this type of setting was cited as being \$92,000.
- The jobs were freed to take on more valuable analytical roles using outputs and automation from Plex.

Modeling and assumptions. The FTE savings is assumed to be stable over the three-year period, as the overall job totals for the customer did not increase even as revenue and output expanded.

Risks. The successful implementation of Plex to replace an on-premises solution demonstrated that other firms should experience reductions in IT administration.

To account for a moderate risk of lower reduction based on firm size, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of \$411,000.

Lower Cost Of IT Administration Via Plex: 8% of benefits



Lower Cost Of IT Administration Via Plex					
Ref.	Metric	CalculationSource	Year 1	Year 2	Year 3
A1	Reduce IT administrator staff from 2.5 to 0.5 FTEs This project has been off pace every step.	Interview	2	2	2
A2	Averaged burdened salary of IT administrator	Payscale.com	\$92,000	\$92,000	\$92,000
At	Lower cost of IT administration via Plex	A1*A2	\$184,000	\$184,000	\$184,000
	Risk adjustment	↓10%			
Atr	Lower cost of IT administration via Plex (risk-adjusted)		\$165,600	\$165,600	\$165,600
Three-year total: \$496,800			Three-year present value: \$411,823		

COST SAVINGS OF PAPERLESS MANUFACTURING PROCESS

Evidence and data. In order to record manufacturing on the plant floor and track it against inventory and its utilization for each production run, two assistants would record the data via paper and clipboard on a daily basis.

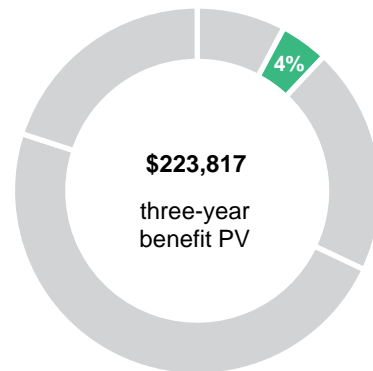
- These production assistant roles were redirected to other aspects of the manufacturing process following the implementation of Plex.
- The average burdened salary of production assistant jobs within this type of setting was cited as being \$50,000.

Modeling and assumptions. The FTE savings is assumed to be stable over the three-year period, as the overall job totals for the customer did not gain even as revenue and output expand.

Risks. The successful implementation of Plex to record transaction-level data on the production process meant that other customers that utilize staff for cycle counts and production data should experience reductions in production assistant costs dedicated to this function.

To account for a moderate risk of lower reduction based on firm size, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of \$224,000.

Cost Savings Of Paperless Manufacturing Process: 4% of benefits



Cost Savings Of Paperless Manufacturing Process					
Ref.	Metric	Source	Year 1	Year 2	Year 3
B1	Number of fewer production assistant FTEs for manual recording	Interview	2.0	2.0	2.0
B2	Averaged burdened salary of shop floor production assistants	Payscale.com	\$50,000	\$50,000	\$50,000
Bt	Cost savings of paperless manufacturing process	B1*B2	\$100,000	\$100,000	\$100,000
	Risk adjustment	↓10%			
Btr	Cost savings of paperless manufacturing process (risk-adjusted)		\$90,000	\$90,000	\$90,000
Three-year total: \$270,000			Three-year present value: \$223,817		

AUTOMATIC TRANSACTION REPORTS SAVED FTES

Evidence and data. The task of creating transaction data and manipulation for the required business and operational analysis equaled seven FTEs.

- Data acquisition, analysis, and reporting is automated via Plex. Roles that previously were responsible for those tasks are now free to create both higher level analysis of operational improvement and cost models to develop the business.
- The averaged burdened salary of the business analyst in this setting was cited as being \$92,000.

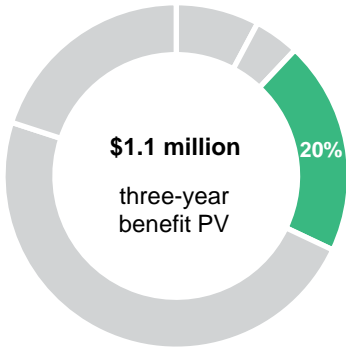
Modeling and assumptions. Resourcing needs are expected to remain stable over the three-year period. While the business grew, the number of employees did not.

- The recapture rate for this productivity enhancement was assumed to be 75%.

Risks. The successful implementation of Plex to create transaction-level data on production processes means that other customers that utilize staff to create transaction reports should experience similar reductions in these costs, though they may vary according to the size and function.

To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$1,058,000.

Automatic Transaction Reports Saved FTES: 20% of benefits



Automatic Transaction Reports Saved FTEs					
Ref.	Metric	Source	Year 1	Year 2	Year 3
C1	Business analyst FTEs saved	Interview	7.0	7.0	7.0
C2	Average burdened salary of business analyst	Payscale.com	\$90,000	\$90,000	\$90,000
C3	Productivity recapture rate	Interview	75%	75%	75%
Ct	Automatic transaction reports saved FTEs	C1*C2*C3	\$472,500	\$472,500	\$472,500
	Risk adjustment	↓10%			
Ctr	Automatic transaction reports saved FTEs (risk-adjusted)		\$425,250	\$425,250	\$425,250
Three-year total: \$1,275,750			Three-year present value: \$1,057,534		

REDUCED INVENTORY WASTE VIA IMPROVED PRODUCTION PROCESSES

Evidence and data. One significant failure of the previous solution was the queuing of production runs without the ability to calibrate SOPs to catch production errors early from mislabeling, machines not performing to standard, and without built-in analytics to identify what processes run best in the production line.

- These capabilities are all incorporated in Plex, enabling the customer to save 10% in inventory waste that was due to previously experienced production errors.

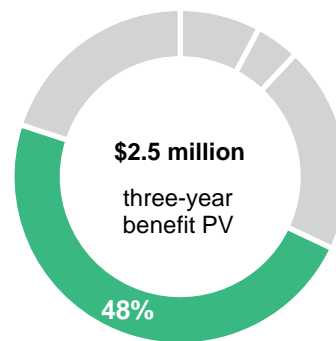
Modeling and assumptions. This 10% factor is applied to the customer’s \$12,000,000 inventory carry in order to arrive at the waste reduction calculation.

- This annual savings was conservatively counted as the previous inventory level was double in the previous solution, and inventory carry was kept constant at \$12,000,000 even with the customer’s business growth.

Risks. Other firms may not have the same use profile or savings factor.

To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year, risk-adjusted total PV of \$2,537,000.

Reduce Inventory Waste Via Improved Production Process: 48% of benefits



Reduced Inventory Waste Via Improved Production Processes					
Ref.	Metric	Source	Year 1	Year 2	Year 3
D1	Total inventory cost	Interview	\$12,000,000	\$12,000,000	\$12,000,000
D2	Cut 10% waste due to production errors	Interview	10%	10%	10%
Dt	Reduced inventory waste via improved production processes	D1*D2	\$1,200,000	\$1,200,000	\$1,200,000
	Risk adjustment	↓15%			
Dtr	Reduced inventory waste via improved production processes (risk-adjusted)		\$1,020,000	\$1,020,000	\$1,020,000
Three-year total: \$3,060,000			Three-year present value: \$2,536,589		

COST SAVINGS FROM LOWER CHARGEBACKS DUE TO LATE PRODUCTION

Evidence and data. The capability of Plex to align raw material supply chains, production schedules, and warehouse cycle times resulted in raising on-time customer order completion to 99% performance.

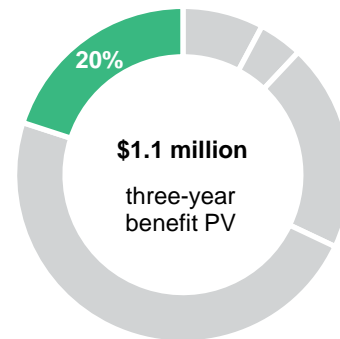
- Over a three-year period, this was cited by the customer as saving \$500,000 per year on average from late delivery, conditions that were more prevalent under the previous system.

Modeling and assumptions. The modeling compared late production charges of Plex versus that of the previous system.

Risks. Not all firms will have the same degree of supply and production sensitivity affecting on-time performance.

To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year, risk-adjusted total PV of \$1,057,000.

Cost Savings From Lower Chargebacks Due To Late Production: 8% of benefits



Cost Savings From Lower Chargebacks Due To Late Production

Ref.	Metric	Source	Year 1	Year 2	Year 3
E1	Customer chargebacks before Plex	Interview	\$650,000	\$650,000	\$650,000
E2	Customer chargebacks following Plex	Interview	\$150,000	\$150,000	\$150,000
Et	Cost savings from lower chargebacks due to late production	E1-E2	\$500,000	\$500,000	\$500,000
	Risk adjustment	↓15%			
Etr	Cost savings from lower chargebacks due to late production (risk-adjusted)		\$425,000	\$425,000	\$425,000
Three-year total: \$1,275,000			Three-year present value: \$1,056,912		

UNQUANTIFIED BENEFITS

Additional benefits that the customer experienced but was not able to quantify include:

- Lean inventories.** The implementation of DemandCaster to drive order lead time, production schedules, and batch lot allocation of inventory permitted the customer organization to reduce its inventory allocation by 50% or \$13 million. This freed operating cash and reduced debt, which was not quantified as a benefit in the economic model, but it was nonetheless significantly positive for the pre-cash flow to be invested in productivity improvements and potential acquisitions.
- Organize and scale across different plants.** DemandCaster allowed the customer to not only order inventory for different plants as one entity but to also apportion production to different plants as the shipment point. As such, the customer organization benefited from not having to order and manage inventory at separate sites, allowing it to realize economies of scale from ordering in larger quantities. This was also cited as making integration of future acquisitions easier.
- Accurate cost model helps expand profitable business.** A newfound understanding of the cost basis to production permitted the creation of

accurate cost models or an array of different products where the organization had less experience; this facilitated new business wins among large retailers.

- Break down silos across warehousing, manufacturing, maintenance, and customer service.** New SOPs were created and implemented as part of training done across departments. Additionally, the improved visibility of the manufacturing operation across the organization removed barriers and showcased the interdependency of these roles.

FLEXIBILITY

The value of flexibility is unique to each customer. There are multiple scenarios in which a customer might implement Plex and later realize additional uses and business opportunities, including:

- Connecting manufacturing via IoT and Plex to do analytics of machine performance, in addition to system performance to enhance the productivity, efficiency, and maintenance elements of the business.

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

Analysis Of Costs

■ Quantified cost data

Total Costs							
Ref.	Cost	Initial	Year 1	Year 2	Year 3	Total	Present Value
Ftr	Plex subscription cost	\$0	\$220,000	\$275,000	\$330,000	\$825,000	\$675,207
Gtr	Plex implementation cost	\$357,500	\$0	\$0	\$0	\$357,500	\$357,500
	Total costs (risk-adjusted)	\$357,500	\$220,000	\$275,000	\$330,000	\$1,182,500	\$1,032,707

PLEX SUBSCRIPTION COST

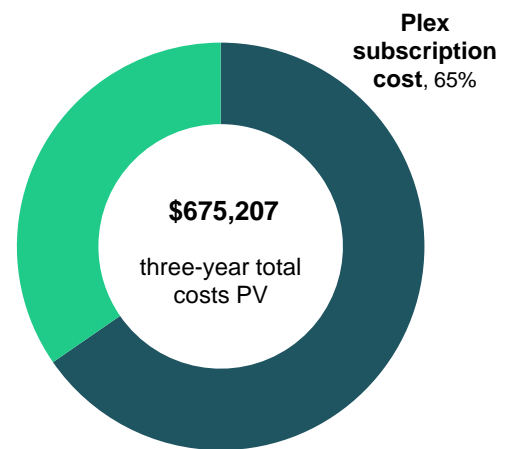
Evidence and data. Plex affords an unlimited number of users to its subscription model. Costs are pegged to company revenue.

- In this instance, subscription costs began in the \$200,000 range. And with the rise in revenue experienced by the customer organization, Plex subscription costs increased 50% over the three-year period.

Modeling and assumptions. Subscription costs and history were gathered from the interviewee and directly loaded into the model.

Risks. While the growth in revenue and subscription cost was significant for this customer, some companies could experience faster growth, which would affect the cost of their Plex Smart Manufacturing platform, the basis of which is tied to revenue growth following implementation.

To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of \$675,000.



Plex Subscription Cost						
Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
F1	Plex subscription cost	Interview		\$200,000	\$250,000	\$300,000
Ft	Plex subscription cost	F1	\$0	\$200,000	\$250,000	\$300,000
	Risk adjustment	↑10%				
Ftr	Plex subscription cost (risk-adjusted)		\$0	\$220,000	\$275,000	\$330,000
Three-year total: \$825,000			Three-year present value: \$675,207			

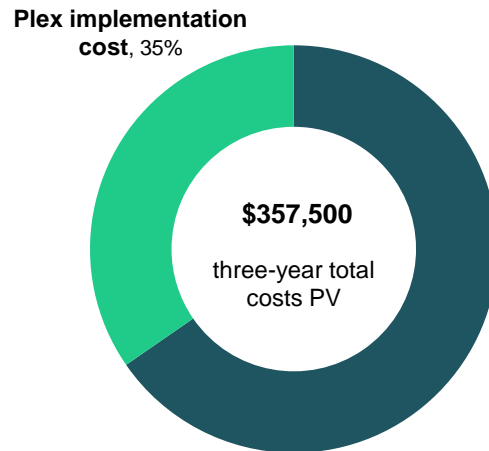
PLEX IMPLEMENTATION COST

Evidence and data. The implementation costs for the customer organization included:

- Implementation of professional services by Plex and the addition of EDI trading partners.
- Internal training through Plex and an overall “train the trainer” approach to permeate Plex knowledge to users throughout the organization.
- The development of updated SOPs.
- The procurement of necessary physical UI interfaces (monitors) and printers for the system.

Modeling and assumptions. These were Year 1 upfront costs taken directly from the customer experience in implementing Plex.

Risks. As there is some risk a customer could have higher costs from longer training cycles and more expansive EDI trading partner additions, Forrester has adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV of \$357,500.

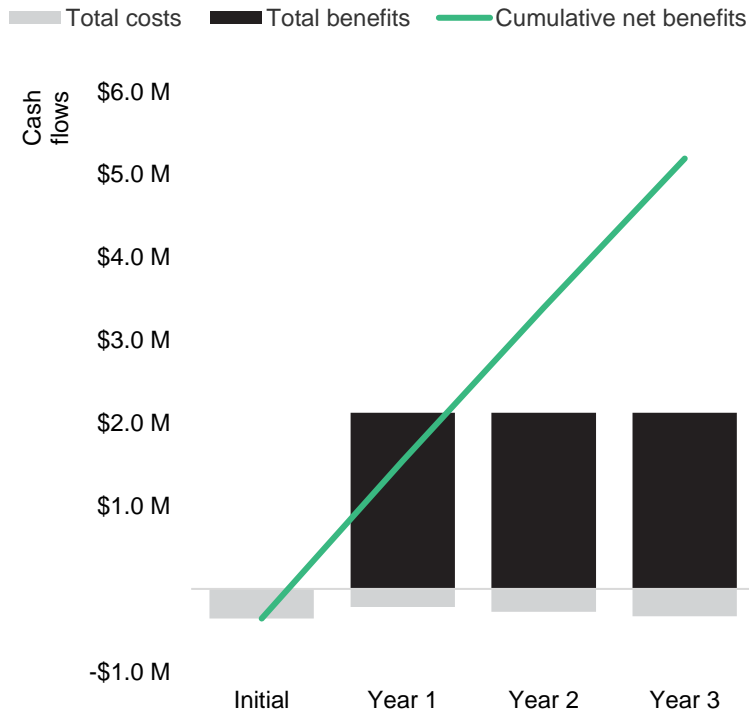


Plex Implementation Cost						
Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
G1	Implementation professional services	Interview	150,000			
G2	Internal training three months	Interview	50,000			
G3	Updating SOPs	Interview	50,000			
G4	Procure supporting hardware	Interview	75,000			
Gt	Plex implementation cost	G1+G2+G3+G4	\$325,000	\$0	\$0	\$0
	Risk adjustment	↑10%				
Gtr	Plex implementation cost (risk-adjusted)		\$357,500	\$0	\$0	\$0
Three-year total: \$357,500			Three-year present value: \$357,500			

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

These risk-adjusted ROI, NPV, and payback period values are determined by applying risk-adjustment factors to the unadjusted results in each Benefit and Cost section.

Cash Flow Analysis (Risk-Adjusted Estimates)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total costs	(\$357,500)	(\$220,000)	(\$275,000)	(\$330,000)	(\$1,182,500)	(\$1,032,707)
Total benefits	\$0	\$2,125,850	\$2,125,850	\$2,125,850	\$6,377,550	\$5,286,675
Net benefits	(\$357,500)	\$1,905,850	\$1,850,850	\$1,795,850	\$5,195,050	\$4,253,968
ROI						412%
Payback period						<6 months

Appendix A: Total Economic Impact

Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

TOTAL ECONOMIC IMPACT APPROACH

Benefits represent the value delivered to the business by the product. The TEI methodology places equal weight on the measure of benefits and the measure of costs, allowing for a full examination of the effect of the technology on the entire organization.

Costs consider all expenses necessary to deliver the proposed value, or benefits, of the product. The cost category within TEI captures incremental costs over the existing environment for ongoing costs associated with the solution.

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

Risks measure the uncertainty of benefit and cost estimates given: 1) the likelihood that estimates will meet original projections and 2) the likelihood that estimates will be tracked over time. TEI risk factors are based on "triangular distribution."

The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1 that are not discounted. All other cash flows are discounted using the discount rate at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations in the summary tables are the sum of the initial investment and the discounted cash flows in each year. Sums and present value calculations of the Total Benefits, Total Costs, and Cash Flow tables may not exactly add up, as some rounding may occur.



PRESENT VALUE (PV)

The present or current value of (discounted) cost and benefit estimates given at an interest rate (the discount rate). The PV of costs and benefits feed into the total NPV of cash flows.



NET PRESENT VALUE (NPV)

The present or current value of (discounted) future net cash flows given an interest rate (the discount rate). A positive project NPV normally indicates that the investment should be made, unless other projects have higher NPVs.



RETURN ON INVESTMENT (ROI)

A project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits less costs) by costs.



DISCOUNT RATE

The interest rate used in cash flow analysis to take into account the time value of money. Organizations typically use discount rates between 8% and 16%.



PAYBACK PERIOD

The breakeven point for an investment. This is the point in time at which net benefits (benefits minus costs) equal initial investment or cost.

Appendix A: Endnotes

¹ 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.

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