

A Forrester Total Economic
Impact™ Study
Commissioned By
GHX

Project Director:
Henry Huang

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The Total Economic Impact™ Of The GHX Platform

Cost Savings And Business Benefits
Enabled By The GHX Platform For A
Healthcare Provider And A Healthcare
Manufacturer

Table Of Contents

Executive Summary	3
Disclosures	8
TEI Framework And Methodology	9
Healthcare Manufacturer Analysis	10
Healthcare Manufacturer Financial Summary	24
Healthcare Provider Analysis	25
Healthcare Provider Financial Summary	38
GHX Supplier / Provider Relationship Analysis	39
GHX Supplier / Provider Relationship Financial Summary	44
GHX Platform: Overview.....	45
Appendix A: Total Economic Impact™ Overview.....	47
Appendix B: Forrester And The Age Of The Customer	48
Appendix C: Glossary	49
Appendix D: Endnotes.....	50

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Executive Summary

GHX 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 GHX Platform and related products and services to automate the procure-to-pay and order-to-cash cycles. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of the GHX platform on their organizations and to better leverage the features of the platform and associated tools to increase efficiency across the healthcare supply chain.

To better understand the benefits, costs, and risks associated with the GHX Platform implementation and use, Forrester interviewed an existing healthcare manufacturer/goods supplier and a healthcare provider, both customers with multiple years of experience using GHX. With this in mind, we explored the various areas of benefit and cost that the organizations incurred from the core Exchange and GHX products and services that are commonly used in conjunction to improve supply chain automation, efficiency, and visibility.

Customers of GHX fall into two subsets: healthcare suppliers and healthcare providers, which are connected and conduct business with one another via the GHX exchange.

The healthcare manufacturer that we interviewed had adopted GHX as the centralized order management platform, following a lack of automation from its previous order management solution, which consisted of various direct electronic data interchange (EDI) connections and manual order acceptance methods like fax, voice, and email. The ability to accommodate additional order volume at the time was a primary concern, as the organization could not scale easily given its existing resources in the orders department. The lack of automation resulted in customer service representatives spending an inordinate amount of time to perform order entry and validation — two steps that GHX has nearly eliminated. In its current-day state, the supplier has increased its order volume significantly to more than \$2 billion of orders annually through the GHX Platform — without having to increase internal human resources. Beyond order management, the organization experienced a number of other benefits too, such as in the areas of data synchronization and electronic invoicing. When asked about the viability of alternate solutions of either direct EDI connections or manual order taking, the VP of marketing at the supplier stated: “Neither of these alternatives are reasonable with the volume that we are processing. Quite frankly, I have not come across anything else that has been able to offer anything remotely close to what GHX offers.”

On the other side of the equation, prior to GHX, order fulfillment issues plagued the interviewed healthcare provider, too. As much as 90% of the provider’s orders were made via fax and phone, making ordering a very manual process. And while the provider had EDI connections with intermediaries and trading partners, EDI transactions at the time were inefficient, too, as only some suppliers made full use of EDI capability. Aside from ordering inefficiencies, the healthcare provider had other objectives — such as going paperless and increasing order accuracy. In moving to GHX, the provider improved efficiencies on the order fulfillment front, but more importantly, attained accuracy and consistency, producing a healthier bottom line. Today, the healthcare provider has increased its electronic vendor base from less than a dozen connected suppliers to over 3,000 and is 98% automated in its order fulfillment process, up from 10% in its previous state. Most important to the provider organization, the GHX Platform has given the organization accurate visibility into the entire procurement cycle, enabling it to decrease the total cost of goods. The director of purchasing at the provider stated, “We were processing orders before, but now, we’re actually buying smarter — a lot smarter — and it has really helped us with the profitability within the organization.”

GHX Exchange brings together healthcare providers and healthcare goods suppliers, helping both sides save costs and greatly increase efficiencies.

The costs and benefits for a \$3 billion global healthcare manufacturer and 800-bed provider with roughly \$1.5 billion of annual spend are as follows:

- **Net present value of the manufacturer solution: \$15,234,547.**
- **Net present value of the provider solution: \$6,647,951.**
- **Total manufacturer/provider supply chain value-add: \$21,882,498.**

GHX GENERATES EFFICIENCY WITHIN THE SUPPLY CHAIN TO IMPROVE THE BOTTOM LINE

Our interviews with the existing customer organizations and subsequent financial analyses found that they experienced the risk-adjusted ROI benefits and costs shown in Figure 1.¹ Additionally, we compiled a risk-adjusted ROI model to depict the effect of the GHX Platform on the overall supply chain value cumulative of both the healthcare manufacturer and healthcare provider.

MANUFACTURER SUMMARY

The three-year manufacturer analysis points to benefits of approximately \$7.8 million per year versus annual costs of roughly \$1.9 million, adding up to a net present value (NPV) of \$15,234,547. With GHX, write-offs due to discrepant and erroneous manual orders were reduced by 2%, amounting to a savings of \$7,828,335. The supplier also experienced benefits in order acceptance efficiency, order accuracy, order exception resolution, improved cash flow from quicker paying receivables, and avoided costs of disparate EDI connections.

FIGURE 1

Financial Highlights Of Healthcare Manufacturer, Showing Three-Year Risk-Adjusted Results



Source: Forrester Research, Inc.

PROVIDER SUMMARY

The provider analysis points to annual average benefits of \$2.8 million versus total annual costs of approximately \$225,000, adding up to an NPV of \$6,647,951. With the GHX Platform, total cost of goods reduction as a result of improved item master accuracy and enrichment and contract price visibility and alignment amounted to over \$3,033,060, and the organization experienced additional savings in improved procurement specialist efficiency, accounts payable efficiency, and infrastructure and consumable cost reductions from prior solutions.

FIGURE 2

Financial Highlights Of Healthcare Provider, Showing Three-Year Risk-Adjusted Results



Source: Forrester Research, Inc.

TOTAL VALUE CHAIN SUMMARY

Cumulatively, the GHX Platform contributed a combined 367% ROI between the interviewed supplier and provider solutions, showing the overall value-add upon this supply chain example. *The NPV of \$21,882,498 added in this relationship shows how a centralized solution that meets the needs of modern healthcare organizations can create value for both sides of the relationship.* Most importantly, the byproduct of this greater efficiency and visibility generated by the GHX Platform has ultimately benefited consumers of healthcare services by enabling providers and suppliers to make better decisions and allocate resources toward what drives greater value in healthcare.

FIGURE 3

Financial Summary Of Combined, Showing Three-Year Risk-Adjusted Results



Source: Forrester Research, Inc.

HEALTHCARE MANUFACTURER

› **Benefits.** The interviewed supplier experienced the following risk-adjusted benefits:

- **Customer service personnel taking in orders became more efficient due to automation enabled by GHX.** The level of automated orders transacted through GHX and the associated G-Fax¹ module rose to 92% of total orders, drastically reducing the number of orders that required manual entry. As a result, 4 minutes per order were saved, across approximately 900,000 purchase orders annually, freeing customer service agents to allocate their time to other value-producing tasks. Total present value (PV) benefit was \$2,702,405 over a three-year horizon.
- **Increased order acceptance accuracy reduced FTE efforts to remediate and correct orders.** With a significant improvement in order accuracy with the GHX Platform and the Order Intelligence Module², data is aligned from buyers and corrected for errors prior to upload into ERPs to avoid discrepancies and manual intervention. Our research indicates that nearly 15% of manually processed orders would contain some type of error, which were now alleviated at an earlier point in the order process with GHX. Total PV benefit was \$1,795,076 over three years.
- **Write-offs and customer disputes were reduced.** Invariably, customers disputed some invoices due to erroneous invoicing or problematic purchase orders, resulting in write-offs at the supplier. Following the adoption of GHX, the accuracy of PO intake and invoicing improved, reducing client invoice disputes and the associated write-offs. Write-off savings over a three-year period amounted to \$7,828,335.
- **Having transitioned the majority of its order intake to GHX, the supplier was not only invoicing customers more accurately, but also more efficiently.** Days sales outstanding (DSO), or the measure of time until an order is paid, improved by 1.5 days on a 30-day cycle. Measuring the improved available cash flow against a conservative weighted average cost of capital minus early-pay discounts equated to a three-year benefit of \$6,434,248 PV.
- **The supplier avoided establishing and maintaining a number of EDI connections and smaller one-to-many networks.** To efficiently connect to many of its large distributors and buyers, this supplier would have needed more than 20 EDI connections and one-to-many intermediary networks to minimally serve its thousands of client partners, which is now unnecessary with the GHX Platform. Each separate EDI connection carries a set-up cost as well as maintenance resources. Conservative estimates suggest that the combination of 20 separate EDI connections and smaller exchange connections are insufficient to carry out the scale of the supplier's current fulfillment levels. As a result, a conservative estimate of the savings realized by not having to go the disparate EDI route is \$1,527,055 PV.

› **Costs.** The interviewed supplier experienced the following risk-adjusted costs:

- **Software licensing fees came to approximately \$1.9 million annually, totaling \$4,979,373 over three years.** These are recurring fees paid to GHX for access to the core GHX exchange as well as modules that add functionality related to supply chain fulfillment.
- **Initial migration and implementation costs were \$73,200.** This is a one-time cost arising from the use of external professional services as well as internal resources to effectively transition to the new system and processes.

¹ G-Fax is GHX's fax to electronic order conversion module that reduces supplier manual entry through a combination of optical character recognition and GHX data entry personnel.

² Order Intelligence is a supplier-side module that corrects invalid data on purchase orders by cross referencing order line items with the GHX content repository and customer set logic filters.

HEALTHCARE PROVIDER

› **Benefits.** The interviewed provider experienced the following risk-adjusted benefits:

- **Following the standardization of data and electronic automation of orders with GHX, discrepant orders dropped from 15% of total orders to 1.1%.** The time savings realized by purchasing agents totaled over 9,404 hours over a three-year period, or the equivalent of \$209,839 in present value terms after risk-adjustment.
- **Order entry automation saved manual worker costs.** As purchase orders could now be automated for most standard items, these orders no longer required the intervention and manual entry that they had previously. Accurate item lists and contract alignment played a large part so that the orders went to the proper vendors in an automated fashion. Savings amounted to \$616,178 PV over three years.
- **Better item master accuracy and enrichment and contract price alignment led to smarter purchasing, in both better negotiation and sourcing from those vendors offering best contractual terms.** Additionally, MetaTrade³ enabled cross-alignment of purchases with contracts even if the vendor was not a part of the GHX network. The organization saw a significant reduction in the total cost of goods, to the tune of \$3,033,060 over three years.
- **Faster electronic invoicing with a lower error rate made for much faster invoice processing, enabling early-payment discounts when available.** Manual entry of invoices was now a thing of the past, and along with that process went errors. Invoices were fully electronic and easily reconcilable with purchase orders. Due to the increased efficiency, the organization processed invoices faster and was able to take advantage of quick-pay for discounts on a more frequent basis. Savings in this category were \$2,876,696 PV.
- **The transition to GHX circumvented infrastructure and consumable costs.** To reasonably handle purchase order volumes required by the provider, significant EDI investments would have had to be made. Conservatively, we estimate a minimum of 10 disparate one-to-many networks and direct EDI connections would be necessary for the organization. Accounting for EDI set-up fees and maintenance, and then adding consumable costs of toner, paper, etc., the organization avoided costs of \$820,962 PV.

› **Costs.** The interviewed provider experienced the following risk-adjusted costs:

- **Software licensing fees were approximately \$225,000 per year, or \$559,754 over three years PV.** These are recurring fees paid to GHX for access to the core platform as well as value-add modules like NuVia⁴, OnDemand AP⁵, and more.
- **Implementation and integration costs amounted to \$349,030 in the initial period prior to effective use of the GHX Platform.** These are initial pre-launch fees paid to GHX and other outside professional services teams to install, integrate, and deploy the GHX Platform. Other costs include internal resources for change management onto the new processes.

³ MetaTrade is a provider side GHX module that enables processing electronic orders to suppliers who are not connected to the GHX network by converting purchase orders to fax or email format.

⁴ NuVia is a data management solution from GHX that cleans and standardizes data continuously to maintain an accurate and up to date product data repository.

⁵ OnDemand AP is a GHX module that helps to increase accounts payable automation through the electronic processing, matching, reconciliation of invoices.

Disclosures

The reader should be aware of the following:

- › The study is commissioned by GHX 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 and/or with the Forrester certified GHX ROI calculator to determine the appropriateness of an investment in GHX Exchange Platform.
- › GHX 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.
- › GHX provided the customer names for the interviews but did not participate in the interviews.

TEI Framework And Methodology

INTRODUCTION

From the information provided in the interviews, Forrester has constructed a TEI framework for those organizations considering implementing GHX Exchange Platform. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision, to help organizations understand how to take advantage of specific benefits, reduce costs, and improve the overall business goals of winning, serving, and retaining customers.

APPROACH AND METHODOLOGY

Forrester took a multistep approach to evaluate the impact that GHX Exchange Platform can have on an organization (see Figure 4). Specifically, we:

- › Interviewed GHX marketing, sales, and/or consulting personnel, along with Forrester analysts, to gather data relative to Exchange Platform and the marketplace for Exchange Platform.
- › Interviewed two organizations currently using GHX Exchange Platform to obtain data on costs, benefits, and risks.
- › Constructed a financial model representative of the interviews using the TEI methodology. The financial model is populated with the cost and benefit data obtained from the interviews.
- › Adjusted financial models to reflect a compacted timeline of three years as the interviewed organizations had been using the GHX platform for over five years. Benefit and cost modeling are extrapolations based on the experience and data points given by the interviewees and may differ from actual figures.
- › Risk-adjusted the financial model based on issues and concerns the interviewed organizations highlighted in interviews. Risk adjustment is a key part of the TEI methodology. While interviewed organizations provided cost and benefit estimates, some categories included a broad range of responses or had a number of outside forces that might have affected the results. For that reason, some cost and benefit totals have been risk-adjusted and are detailed in each relevant section.

Forrester employed four fundamental elements of TEI in modeling GHX Exchange Platform's service: 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.

FIGURE 4
TEI Approach



Source: Forrester Research, Inc.

Healthcare Manufacturer Analysis

ORGANIZATION CHARACTERISTICS

For this study, Forrester conducted interviews with representatives from the following company, which is a GHX customer based in the US:

- › This healthcare manufacturer is a publicly listed S&P 500 company with over 14,000 employees.
- › Its annual revenues top \$3 billion as of 2014 with continued healthy growth.
- › It is a leader in the medical devices and technology field, manufacturing and distributing its products to healthcare organizations worldwide.
- › For the purposes of this study, we focused on the US segment of the organization, where annual revenues were \$2.3 billion to \$2.5 billion over the 2012 to 2014 range.²
- › The supplier works with buyers ranging from individual practitioners and hospitals to extended-care facilities and distributors, through a variety of channels.
- › Growth was a priority for this public company, and handling that growth was an important component of its strategy.

With a major presence in North America and Europe, this supplier is a leader in vascular, urology, oncology, and surgical goods. On the heels of many acquisitions and line extensions, the organization sought to rapidly increase growth and viewed automation as an important means to achieve it, especially when the existing formats of order intake were not easily scalable. At the time, the supplier considered GHX Exchange Platform and other EDI measures as possible investments to carry out its great growth strategy.

Based on the interviews, Forrester constructed a TEI framework and an associated ROI analysis that illustrates the areas financially affected.

“While we always had the ability to take electronic orders, only 2% of our order volume was electronic. But because GHX leveraged their connection to so many of the buyers and suppliers, we all benefited. GHX orders now account for 88% of all our orders.”

~ VP of marketing, healthcare manufacturer

“I have not come across anything else that has been able to offer anything remotely close to what GHX offers. Even with tens of EDI connections, it still would not be able to handle the volume that we transact.”

~ VP of marketing, healthcare manufacturer

INTERVIEW HIGHLIGHTS

Situation

Prior to working with GHX for its order processing needs, the interviewed supplier operated on a cornucopia of solutions ranging from some that were electronic (through direct EDI connections with individual customers) to others that were mostly manual — faxes, emails, and telephone orders. Main concerns at the time focused on the inability to scale its order acceptance operations without:

- › A significant increase in its workforce to input orders, cross-check orders against pricing contracts, validate orders and provide fulfillment lead times, and manage invoices and proper payments.
- › A significant investment in multiple EDI connections, requiring IT resources as well as a means to integrate all the information into a centralized location for improved management visibility.

While a large number of EDI connections would have worked to automate many procedures, it was not forward-looking and provided limited benefits beyond automation. Quickly, this supplier organization realized that GHX addresses issues from both the supplier and provider side, bringing a synergistic effect on the reduction of errors and improving the overall supply chain.

Solution

The interviewed supplier selected Exchange Platform for its ability to provide a configurable out-of-the-box solution that required minimum maintenance while offering a breadth of functionalities and strong industry capabilities to simplify the overall order acceptance and accounts receivable process.

The interview revealed that:

- › **The organization achieved 92% automation on order acceptance, through either a direct GHX connection (88%) or with non-GHX members that faxed/emailed orders in and converted them to GHX via G-Fax (4%).** By reducing the time spent on order entry and price validations, the supplier was able to reallocate these FTEs to other value-add activities. The organization managed the overall growth in orders without needing to increase personnel.
- › **Accuracy drastically improved, saving the company in FTE time to correct discrepant orders and reducing write-offs and concessions to errors.** Writing off 2% of its orders was a thing of the past, as errors were far less common — starting from the provider side all the way through the supplier side.
- › **Cash flow improved due to electronic invoicing.** As the organization grew, cash flow demands became more important. Using 810 Invoice directly through GHX, clear, non-discrepant invoices arrived on the buyer's desk sooner, often decreasing the days sales outstanding (DSO) rate by 1.5 days for 30-day cycles.

“With over 88% of our orders going through GHX every year, it has been relatively seamless. I can’t say the same would be true for building direct connections or manual orders.”

~ VP of marketing, healthcare manufacturer

SUPPLIER BENEFITS

The interviewed organization experienced a number of quantified benefits in this case study:

- › Supplier FTE efficiency gain: PO and order acceptance entry.
- › Supplier FTE effort reduction in order intervention from improved purchase order accuracy.
- › Supplier 810 Invoice and discrepancy-related write-off savings.
- › Improved cash flow cost of capital savings.
- › Supplier cost avoidance of separate EDI connections.

Another important benefit mentioned by the interviewed organization was *an increase in customer satisfaction* from being able to deliver products and data correctly and in a timely fashion. While customer satisfaction depends also on a number of other factors, the value-add to be able to deliver consistently over and over again is highly valued by this healthcare manufacturer in maintaining a leadership position in the market.

Forrester noted further benefits, which were not represented in this case study due to a lack of recent data. Interested parties should follow up with GHX and explore the Forrester-certified ROI tool to receive a more comprehensive analysis as it pertains to your company.

(Readers should note that costs and benefits have been compacted to a three-year time horizon to better represent the actual scenario of adopting the GHX Platform at an organization. Benefits are extrapolated estimations based on the information and metrics provided by the supplier and may differ slightly from the actual derived benefits.)

Customer Satisfaction on the buyer side was dramatically improved. While this was not quantified for this supplier, Forrester's prior research in Customer Experience (CX) has indicated a high correlation between increased customer life time value and the CX index score of an organization.





Supplier FTE Efficiency Gain: PO And Order Acceptance Entry

By transitioning to GHX, the supplier organization raised its order automation rate to 92%, 88% through the GHX Exchange (4% was through G-Fax, for those providers that were not yet able to accept EDI transactions). As a result of this level of automation, the supplier organization was able to accept and acknowledge orders efficiently with extreme scale. By the supplier's estimations, each order previously took an average of 4 minutes to enter and confirm, whereas the full process is now almost entirely automated and reduces the time to process by 90%. Accepting nearly 900,000 purchase orders yearly with GHX has enabled the organization to realize over \$1 million a year in savings by repurposing its order entry agents. Over three years in PV, the savings realized from automated order acceptance was \$3,633,497, or roughly \$1.85 per purchase order received.

Understanding that not all organizations have the same technologies in place prior to implementing Exchange Platform, we risk-adjusted this benefit by 10% to compensate for organizations that may already have some form of order acceptance automation — perhaps by OCR or various EDI integrations. The risk-adjusted benefit over three years in PV was \$2,702,405. See the section on Risks for more detail.

TABLE 1
Supplier FTE Efficiency Gain: PO And Order Acceptance/Entry

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
A1	Total annual POs			870,000	913,500	959,175
A2	POs accepted through GHX Exchange			88%	88%	88%
A3	POs accepted through G-Fax			4%	4%	4%
A4	Average time to intake an order in existing state via fax, email, phone, and other EDIs (in minutes)			4	4	4
A5	Average improvement in order intake time with GHX Exchange and G-Fax over previous solution			90%	90%	90%
A6	Customer service representative FTE hourly rate, fully loaded			\$24	\$24	\$24
At	Supplier FTE efficiency: PO and order acceptance/entry	$A1*(A2+A3)*A4*A5*A6/60$	\$0	\$1,152,576	\$1,210,205	\$1,270,715
	Risk adjustment	↓10%				
Atr	Supplier FTE efficiency: PO and order acceptance/entry (risk-adjusted)		\$0	\$1,037,318	\$1,089,184	\$1,143,644

Source: Forrester Research, Inc.



Supplier FTE Effort Reduction In Order Intervention From Improved Purchase Order Accuracy

Prior to GHX, in its previous solution using EDI, phone orders, and fax, the supplier encountered many exceptions to orders. All things considered, the problems could have originated from the purchasing site with poor data, or worse, could have arisen after it was transmitted to the supplier. Regardless, manual processing often resulted in order discrepancies that needed manual intervention to resolve.

With GHX, the rate of discrepancies went down significantly, saving the supplier an average of 15 minutes per order. With the sheer number of transactions now flowing through GHX, we calculate that the supplier is saving more than 30,000 labor hours, or roughly 16 FTEs per year, with the decreased number of order discrepancies. By assigning a fully loaded hourly rate of \$24 per hour for these customer service agents, we calculate that the supplier saved a PV total of \$1,795,076 over three years.

TABLE 2

Supplier FTE Effort Reduction In Order Intervention From Improved Purchase Order Accuracy

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
B1	Total annual POs			870,000	913,500	959,175
B2	POs accepted through GHX			88%	88%	88%
B3	Percent of orders that have discrepancies if manually processed			15%	15%	15%
B4	Time savings per discrepant order passed through GHX Order Intelligence (in minutes)			15	15	15
B5	Customer service representative FTE hourly rate, fully loaded			\$24	\$24	\$24
Bt	Supplier FTE effort reduction in order intervention from improved purchase order accuracy	$B1*B2*B3*B4/60*B5$	\$0	\$689,040	\$723,492	\$759,667
	Risk adjustment	0%				
Btr	Supplier FTE effort reduction in order intervention from improved purchase order accuracy (risk-adjusted)		\$0	\$689,040	\$723,492	\$759,667

Source: Forrester Research, Inc.



Supplier 810 Invoice And Discrepancy-Related Write-off Savings

Another related consequence of lacking full automation in the fulfillment process was invoice discrepancies. Orders that aren't processed in an automated manner often have some degree of inaccuracy due to inconsistencies around pricing, part number, unit of measure, and the likes. Likewise, these problems extend to invoicing, resulting in a customer dispute either on pricing or the fulfilled item itself. Observed invoice discrepancies prior to GHX were 10% of total invoices with as much as 2% of total invoices ending in some form of supplier concession or write-off. On GHX, those orders using 810 Invoice automation saw a nearly complete elimination of the 10% of discrepant invoices. Write-offs and concessions in turn were also nearly eliminated following the automation. Total write-off savings in three years amounted to \$8,698,150 PV.

Differing organizations have differing policies on write-offs and concessions. As a result, other organizations may experience fewer concessions, and Forrester has risk-adjusted this benefit to better reflect real-world scenarios. Following a 10% decrease to this benefit, the three-year PV of this benefit was \$7,828,335. See the section on Risk for more details.

TABLE 3
Supplier 810 Invoice And Discrepancy-Related Write-Off Savings

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
C1	Total US annual revenue			\$2,364,800,000	\$2,435,744,000	\$2,508,816,320
C2	Percentage of GHX orders that used 810 Invoice or eInvoicing			70%	72%	74%
C3	Invoice discrepancies without 810 Invoice or eInvoicing			10%	10%	10%
C4	Reduction in discrepancy write-offs			2%	2%	2%
C5	Savings from invoice discrepancy-related write-offs	$C1 \times C2 \times C3 \times C4$		\$3,310,720	\$3,507,471	\$3,713,048
Ct	Supplier 810 Invoice and discrepancy-related write-off savings	$C5 + C8$	\$0	\$3,310,720	\$3,507,471	\$3,713,048
	Risk adjustment	↓10%				
Ctr	Supplier 810 Invoice and discrepancy-related write-off savings (risk-adjusted)		\$0	\$2,979,648	\$3,156,724	\$3,341,743

Source: Forrester Research, Inc.



Improved Cash Flow Cost Of Capital Savings

The enabling of 810 Invoice generated lower rates of discrepancy and enabled faster customer billing. The days sales outstanding (DSO) decreased by 1.5 days on 30-day cycles, translating to an 18-day decrease over the period of a year. To similarly have this level of cash flow via an alternate means, we investigated the organization's weighted average cost of capital and noted 6%+. Accounting for a standard 2% quick pay discount allowance, and also a possibility the organization is able to obtain cheaper capital with a different debt/equity mix, we conservatively set 3% as the cost of capital saved from the improved cash flow.

Overall gains are calculated to be \$6,434,248 in PV over three years. The benefits of the actual increased cash flow have not been quantified — but improved cash flow is always a plus.

TABLE 4
Improved Cash Flow Cost Of Capital Savings

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
D1	Total US annual revenue			\$2,364,800,000	\$2,435,744,000	\$2,508,816,320
D2	Percentage of GHX orders that utilized 810 Invoice or eInvoicing			70%	72%	74%
D3	Day sales outstanding (DSO) improvement, in days per year			18	18	18
D4	Cost of capital on improved cash flow			3%	3%	3%
Dt	Improved cash flow cost of capital savings	$D1 * D2 * (D6/365) * D7$	\$0	\$2,449,026	\$2,594,568	\$2,746,638
	Risk adjustment	0%				
Dtr	Improved cash flow cost of capital savings (risk-adjusted)		\$0	\$2,449,026	\$2,594,568	\$2,746,638

Source: Forrester Research, Inc.



Supplier Cost Avoidance Of Separate EDI Connections

When investigating alternate solutions, the supplier noted that the cost of disparate direct EDI connections and a number of value-added network (VAN) EDIs was generally an expensive proposition with a limited return. The problem stemmed from the lack of consolidation in vendors and buyers on the other platforms to provide enough of a synergistic network. One of the primary advantages of the GHX platform is the ability for the supplier to connect with the majority of its customers through a single exchange, vs. having to connect to customers through other smaller one-to-many exchanges or through direct EDI connections. For the purposes of quantifying the value, we have conservatively estimated 20 EDI connections and a number of small one-to-many exchanges would be necessary. Adding set-up costs and maintenance costs, this route could have been cheaper in the short run, but it misses on all the marks of the value-add functionality present on the GHX platform that deliver additional value in the long run. Processes and workflows too would suffer, as information was no longer centralized, causing issues such as contract alignment and order disputes. Our three-year analysis of this cost aversion benefit is \$1,527,055 PV.

TABLE 5
Supplier Cost Avoidance Of Separate EDI Connections

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
E1	Minimum number of alternate EDI connections necessary		20			
E2	IT hours required to establish individual EDIs, inclusive of EDI mapping, ERP integration, and implementation		80			
E3	EDI hardware costs (dedicated)		\$40,000	\$4,000	\$4,000	\$4,000
E4	EDI software/translator software costs		\$90,000			
E5	Annual EDI maintenance and monitoring, hours required per connection	12 hours/month * 12		144	144	144
E6	Cost of internal IT labor, per hour, fully loaded		\$50	\$50	\$50	\$50
E7	Cost of EDI maintenance averted			\$224,000	\$224,000	\$224,000
E8	Cost of alternate EDI setup	$(D1 * D2 * D6) + (D1 * D3) + D4$	\$970,000	\$0	\$0	\$0
Et	Supplier cost avoidance of separate EDI connections	E7+E8	\$970,000	\$224,000	\$224,000	\$224,000
	Risk adjustment	0%				

Etr	Supplier cost avoidance of separate EDI connections (risk-adjusted)	\$970,000	\$224,000	\$224,000	\$224,000
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Source: Forrester Research, Inc.

Total Supplier Benefits

Table 6 shows the total of all benefits across the five areas listed above, as well as PVs discounted at 10%. Over three years, the composite organization expects risk-adjusted total benefits to be a PV of more than \$20.2 million.

TABLE 6
Total Supplier Benefits (Risk-Adjusted)

Ref.	Benefit Category	Initial	Year 1	Year 2	Year 3	Total	Present Value
Atr	Supplier FTE efficiency: PO and order acceptance/entry	\$0	\$1,037,318	\$1,089,184	\$1,143,644	\$3,270,146	\$2,702,405
Btr	Supplier FTE effort reduction in order intervention from improved purchase order accuracy	\$0	\$689,040	\$723,492	\$759,667	\$2,172,199	\$1,795,076
Ctr	Supplier 810 Invoice and discrepancy-related write-off savings	\$0	\$2,979,648	\$3,156,724	\$3,341,743	\$9,478,116	\$7,828,335
Dtr	Improved cash flow cost of capital savings	\$0	\$2,449,026	\$2,594,568	\$2,746,638	\$7,790,232	\$6,434,248
Etr	Supplier cost avoidance of separate EDI connections	\$970,000	\$224,000	\$224,000	\$224,000	\$1,642,000	\$1,527,055
	Total benefits (risk-adjusted)	\$970,000	\$7,379,032	\$7,787,968	\$8,215,692	\$24,352,692	\$20,287,119

Source: Forrester Research, Inc.

SUPPLIER COSTS

The interviewed supplier organization experienced a number of costs associated with the Exchange Platform solution:

- › Software and module costs.
- › Migration and implementation costs.

These represent the mix of internal and external costs experienced by the interviewed supplier organization for initial planning, implementation, and ongoing maintenance associated with the solution. Readers should note that costs and benefits have been compacted to a three-year time horizon to better represent the actual scenario of adopting the GHX Platform at an organization. Costs are extrapolated estimations based on the information and metrics provided by the supplier and may differ slightly from the actual costs.



Software And Module Costs

Software costs consisted of the core Exchange Platform as well as optional modules that add functionality. Subscription and maintenance costs for the core Exchange platform and most modules incur yearly fees. Over a period of three years, the interviewed organization incurred a PV total of \$4,979,373 in software fees.

TABLE 7
Software And Module Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
F1	GHX Exchange core and module one-time costs		\$1,930,000	\$0	\$0	\$0
F2	GHX Exchange core and module recurring costs				1,905,500	1,962,665
Ft	Software and module costs	F1+F2	\$1,930,000	\$0	\$1,905,500	\$1,962,665
	Risk adjustment	0%				
Ftr	Software and module costs (risk-adjusted)		\$1,930,000	\$0	\$1,905,500	\$1,962,665

Source: Forrester Research, Inc.



Migration And Implementation Costs

The supplier stated that the installation of GHX was fairly straightforward. However, there were additional costs to migrate and integrate Exchange Platform with the organization's ERP and existing procurement processes. The supplier incurred change management costs and training costs during the transitional period, and in total, this came to \$73,200, all incurred within the initial six months of implementation.

TABLE 8
Migration And Implementation Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
G1	Professional services setup		\$40,000			
G2	Change management and training efforts: power users and administrators (in hours)	40 hours * 2 personnel	80			
G3	Power user labor cost per hour		\$40			
G4	Change management and training efforts: regular users (in hours)	20 hours * 60 personnel	1,200			
G5	Regular user labor cost per hour		\$25			
Gt	Migration and implementation costs	$G1+(G2*G3)+(G4*G5)$	\$73,200	\$0	\$0	\$0
	Risk adjustment	0%				
Gtr	Migration and implementation costs (risk-adjusted)		\$73,200	\$0	\$0	\$0

Source: Forrester Research, Inc.

Total Supplier Costs

Table 9 shows the total of all costs as well as associated PVs, discounted at 10%. Over three years, the representative organization expects costs to total a PV of just over \$5 million.

TABLE 9
Total Supplier Costs (Risk-Adjusted)

Ref.	Cost Category	Initial	Year 1	Year 2	Year 3	Total	Present Value
Ftr	Software and module costs	(\$1,930,000)	\$0	(\$1,905,500)	(\$1,962,665)	(\$5,798,165)	(\$4,979,373)
Gtr	Migration and implementation costs	(\$73,200)	\$0	\$0	\$0	(\$73,200)	(\$73,200)
	Total costs (risk-adjusted)	(\$2,003,200)	\$0	(\$1,905,500)	(\$1,962,665)	(\$5,871,365)	(\$5,052,573)

Source: Forrester Research, Inc.

FLEXIBILITY

Flexibility, as defined by TEI, represents an investment in additional capacity or capability that could be turned into business benefit for some 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. There are multiple scenarios in which a customer might choose to implement the GHX Exchange Platform and later realize additional uses and business opportunities. Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in Appendix A).

Due to the modularity of the GHX Platform, we fully expect additional features to be made available to suppliers for a small incremental investment. With so much of the GHX Platform presently focused on medium sized and larger suppliers and providers, ***potential customers should note that there are additional offerings that serve smaller providers that don’t yet have EDI capabilities but desire to order online.*** As technology moves forward, our belief is that GHX will continue to provide forward-looking capabilities to ensure that healthcare supply chain automation is maximized for its users.

For almost all suppliers, a present-day investment in the GHX Platform provides future benefit when organizations opt to change trading partners and GPOs. GHX’s leading market presence ensures data interoperability/compatibility with a tremendous network of trading partners. And unlike direct EDI connections to single partners, the GHX solution lets organizations establish new business relationships without adding significant incremental cost.

RISKS

Forrester defines two types of risk associated with this analysis: “implementation risk” and “impact risk.” Implementation risk is the risk that a proposed investment in GHX Exchange Platform may deviate from the original or expected requirements, resulting in higher costs than anticipated. Impact risk refers to the risk that the business or technology needs of the organization may not be met by the investment in the GHX Exchange Platform, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for cost and benefit estimates.

Quantitatively capturing implementation risk and impact risk by directly adjusting the financial estimates results provides more meaningful and accurate estimates and a more accurate projection of the ROI. In general, risks affect costs by raising the original estimates, and they affect benefits by reducing the original estimates. The risk-adjusted numbers should be taken as “realistic” expectations since they represent the expected values considering risk.

The following impact risks that affect benefits are identified as part of the analysis:

- › Supplier FTE efficiency on PO and order acceptance can show a range in results depending on the maturity of the organization’s existing technology and fulfillment processes. Some organizations use a higher level of automation through increased EDI usage and hence may see a lower improvement in time saved.
- › Supplier 810 Invoice and write-off rates may vary between organizations due to internal policies on order acceptance. For organizations that prefer not to offer concessions to customers due to order disputes and/or mistakes, the benefit realization in this category could be decreased.

Table 10 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates for the interviewed organization. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

TABLE 10
Benefit And Cost Risk Adjustments

Benefits	Adjustment
Supplier FTE efficiency: PO and order acceptance/entry	↓ 10%
Supplier 810 Invoice and discrepancy related write-off savings	↓ 10%
Costs	Adjustment
N/A	

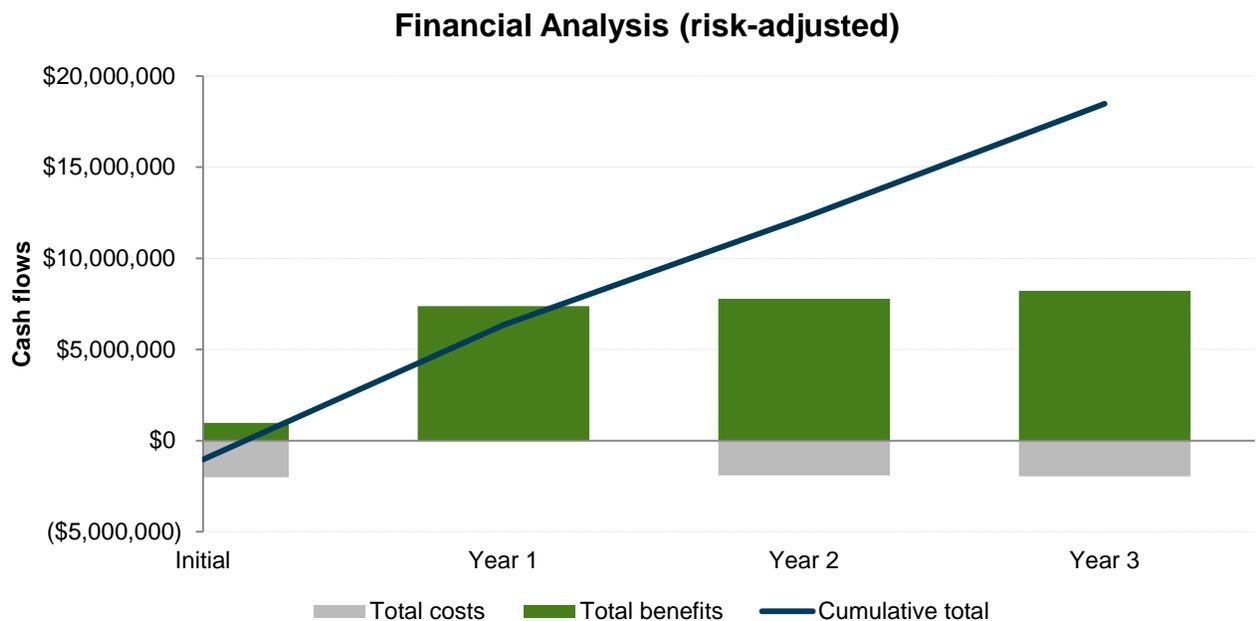
Source: Forrester Research, Inc.

Healthcare Manufacturer 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 interviewed supplier organization's investment in the Exchange Platform.

Table 11 below shows the risk-adjusted ROI, NPV, and payback period values. These values are determined by applying the risk-adjustment values from Table 10 in the Risk section to the unadjusted results in each relevant cost and benefit section.

FIGURE 5
Cash Flow Chart (Risk-Adjusted)



Source: Forrester Research, Inc.

TABLE 11
Supplier Cash Flow (Risk-Adjusted)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Costs	(\$2,003,200)	\$0	(\$1,905,500)	(\$1,962,665)	(\$5,871,365)	(\$5,052,573)
Benefits	\$970,000	\$7,379,032	\$7,787,968	\$8,215,692	\$24,352,692	\$20,287,119
Net benefits	(\$1,033,200)	\$7,379,032	\$5,882,468	\$6,253,027	\$18,481,327	\$15,234,547
ROI						302%
Payback period						< 6 months

Source: Forrester Research, Inc.

Healthcare Provider Analysis

ORGANIZATIONAL CHARACTERISTICS

For this study, Forrester conducted an in-depth interview with representatives from a healthcare provider organization that is a GHX customer based in the United States. Some high-level characteristics of the interviewed organization include:

- › It is a US-based nonprofit hospital with roughly 800 beds and over 1,400 physicians.
- › It employs approximately 8,000 FTEs and has an annual budget of roughly \$1.5 billion.
- › Areas of specialty include orthopedics, pediatrics, and oncology.
- › It ranks as the No. 4 largest hospital in the United States based on admissions.
- › It is laser-focused on providing the best care possible and is listed as one of the 50 Best Hospitals in America.

Situation

The provider has been in a growth phase, especially with the increase in number of trading partners and medical supply SKUs. Given this, the organization sought to streamline its procurement process, starting with infrastructure. Initial goals were to go paperless, be more accurate, and move the procurement process along at a faster pace. As an institution at the forefront of technology, it had already transacted in electronic formats but wanted to more fully utilize those benefits. Its list of requirements for a new solution included:

- › Procurement processes automated and streamlined to reduce the need for human intervention.
- › Electronic processing to reduce paper footprint, especially for the purposes of reconciling and management reporting.
- › Improved accuracy to reduce redundant tasks.
- › A one-to-many connection to realize platform synergies and minimize EDI upkeep.

Before the introduction of GHX, EDI transmissions accounted for only 10% of the provider's orders, even though three of its major trading partners were connected directly via EDI connections. They surmised that while EDI was available with other trading partners, many suppliers simply didn't take advantage of its capabilities due to an unwillingness to change and make full use of EDI. And, while the 10% automation improved staff efficiency, it did not outweigh EDI costs. Paper fax, email, and phone were the incumbent order methods of choice for this provider; increasing order volume was impossible under this scenario.

Solution

After moving to the GHX Platform, the organization saw benefits beyond ordering efficiency; the GHX modules offered such possibilities as item master cleansing, standardization, and enrichment, positively affecting other aspects of the procurement operation. Moreover, contract price alignment and matching ensured that the lowest negotiated rates were being used. It was at this point that the provider realized that the benefits of the Exchange Platform were far-reaching and would improve

“GHX gives us more than a streamlined ordering process; it's given me cleaned-up information with the NuVia system and helped us to understand the profitability of the service lines within the hospitals and make better overall buying decisions.”

~ VP of supply chain, US healthcare provider

the entire order procurement life cycle. Other organizational users of GHX, too, saw the benefits and contributed to a community that increased overall automation and decreased the need for human intervention or more touchless orders. When asked what it would take for the provider to replace their GHX solution, the director of procurement replied: “Visually, the appearance of a Roman galley ship is what I approximate we would need in headcount.”

Results

The interview revealed that:

- › **Mundane manual activities like order entry were reduced to a minimum.** Order entry has become an automated process at the provider, done at speeds and accuracy that could not be obtained otherwise. Order acknowledgment and confirmation, too, were now automated.
- › **As modules CCXpert⁶ and NuVia improved the matching of standardized item lists to contract pricing, overall purchase order accuracy improved and negated much of the need for manual order discrepancy intervention.** Discrepant orders were reduced from 15% of total orders to 1.1% with GHX. And while the provider interviewed was already an efficient organization in discrepancy resolution, there was still a significant amount of time to be saved by FTEs that were tasked with order resolution.
- › **Cost basis improved with CCXpert and NuVia, extending to even non-GHX suppliers by utilizing MetaTrade.** Using better item lists and accurate contract alignment, the organization was able to ensure accurate, and at times lower, pricing with suppliers not connected to the GHX exchange by having proper pricing loaded onto their own purchase orders. The non-GHX suppliers benefited, too, in the decreased effort to resolve discrepancies; however, that benefit has not been quantified in this case study.
- › **Infrastructure and consumable use decreased or was averted.** The adoption of GHX made extraneous paper and toner use for purchase orders and invoices, as well as disparate EDI connections, mostly obsolete.

“One way to put it is that we were processing things before, but now, we’re buying smarter – a lot smarter – and it has really helped us with the profitability within the organization.”

~ VP of supply chain, US healthcare provider

Based on the interview data points collected, Forrester constructed a TEI framework and an associated ROI analysis that illustrates the areas financially affected.

⁶ CCXpert is a contract management tool for healthcare providers on the GHX Platform. It serves to maintain pricing accuracy and optimization through contract and pricing validation as well increasing contract visibility.

PROVIDER BENEFITS

The interviewed provider organization experienced a number of quantified benefits in this case study:

- › Reduced buyer intervention/effort for discrepant orders.
- › Reduced buyer effort for simple order entry (nondiscrepant).
- › Savings from the total cost of goods.
- › Savings from integrated electronic invoicing.
- › Infrastructure and consumable cost savings.

An additional benefit that the interviewed customer experienced was better management of inventory, made possible by the cleansing of its item master data with NuVia. And while this benefit was not quantified, the cleansing and maintained integrity of this data helped the organization more efficiently use its other line of business (LOB) applications, such as ERP, that depend on clean data. Management now had better visibility and better insight into cost, utilization, and inventory matters, all contributing to an improved organizational bottom line.

Forrester noted further benefits, which were not represented in this case study due to a lack of recent data. Interested parties should follow up with GHX and explore the Forrester-certified ROI tool to receive a more comprehensive analysis as it pertains to your company.

Readers should note that costs and benefits have been compacted to a three-year time horizon to better represent the actual scenario of adopting the GHX platform at the interviewed organization. Benefits are extrapolated estimations based on the information/metrics provided by the provider and may differ slightly from the actual derived benefits.



Reduced Buyer Intervention/Effort For Discrepant Orders

Discrepancies and errors are likely to occur when customers order manually, particularly when the item master is in poor shape or contracts are not aligned. This was the case at the interviewed provider before the GHX implementation: Existing orders that were discrepant amounted to as much as 15%, with each of these orders taking 15 minutes to resolve. Readers should note that our previous research on this indicates that many other organizations are likely to take a much longer time, often in the range of 30 to 50 minutes, to resolve discrepant orders. The 15 minutes that this provider spent to resolve discrepancies was likely attributable to its process maturity and workflows designed to minimize these issues. Still, the interviewed organization reduced its order discrepancies to 1.1% from 15% due to its push to move 98% of its purchase volume onto the GHX Platform.

In tallying the hours saved from reduced FTE manual intervention, we found that the provider organization saved between \$89,497 and \$98,670 annually. While this particular organization was already fairly efficient in handling discrepancies, it is clear that the gains it has reaped from GHX are still sizable. More impressive still is the organization's 98% order rate through GHX. This may not be as realistic in other provider organizations, and as a result, we have risk-adjusted this benefit table to reflect the possibility that utilization rate is not quite as high. The risk-adjusted benefit total after three years is \$253,924 PV. See the section on Risks for more detail.

TABLE 12
Reduced Buyer Intervention/Effort For Discrepant Orders

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
A1	Total annual purchase orders			87,600	91,980	96,579
A2	Percentage processed now through GHX Exchange/GHX MetaTrade			98%	98%	98%
A3	Percentage of GHX purchase orders discrepant requiring manual intervention			1.1%	1.1%	1.1%
A4	Existing percent of discrepant orders			15%	15%	15%
A5	Discrepant purchase order decrease delta	$A1 * A2 * (A4 - A3)$		11,933	12,530	13,156
A6	Time saved per discrepant order (in minutes)			15	15	15
A7	Total time saved annually with lower discrepant orders (in minutes)	$A5 * A6$		178,993	187,943	197,340
A8	FTE buyer/requisitioner hourly cost, fully loaded			\$30	\$30	\$30
At	Reduced buyer intervention/effort for discrepant orders	$A7 / 60 * A8$	\$0	\$89,497	\$93,971	\$98,670
	Risk adjustment	↓10%				
Atr	Reduced buyer intervention/effort for discrepant orders (risk-adjusted)		\$0	\$80,547	\$84,574	\$88,803

Source: Forrester Research, Inc.



Reduced Buyer Effort For Simple Order Entry (Nondiscrepant)

Going paperless and automating everything were primary goals of the interviewed organization when transitioning to GHX. Motivations for this were twofold, as the organization wanted to:

- Reduce errors/improve accuracy.
- Drive automation and reduce human input.

Prior to GHX, a majority portion of orders were made manually via phone or fax, which required cross-checking of pricing, then manual input, and finally waiting for confirmation of receipt — taking 10 minutes per order overall. Following the migration to GHX, the 60% of orders that had been non-automated were now all converted to be electronic. Over three years, order entry personnel saved 27,616 hours, or the equivalent of roughly 14 FTEs. Errors were reduced, as evidenced by reduction in the discrepant orders and FTE effort.

It is important to note that our previous research on GHX indicated that customers typically require 26 minutes from order entry to the order confirmation step. Our assumption for this high efficiency at the interviewed organization is, again, its relative maturity on process optimization. When reading this study, readers may also determine they are at a different baseline state than the interviewed organization; for instance, they may have higher or lower levels of existing automation from increased use of EDI intermediaries. In favor of conservatism, we have risk-adjusted this benefit category and reduced the total three-year PV benefit by 10% to \$616,178. See the section on Risks for more detail.

TABLE 13
Reduced Buyer Effort For Simple Order Entry (Non-discrepant)

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
B1	Total annual purchase orders			87,600	91,980	96,579
B2	Orders manually processed in previous state			60%	60%	60%
B3	Time saved per non-discrepant order, in minutes over manual entry			10	10	10
B4	FTE buyer/requisitioner hourly cost, fully loaded			\$30	\$30	\$30
Bt	Reduced buyer effort for simple order entry (non-discrepant)	$B1*B2*B3/60^*$	\$0	\$262,800	\$275,940	\$289,737
	Risk adjustment	↓10%				
Btr	Reduced buyer effort for simple order entry (non-discrepant) (risk-adjusted)		\$0	\$236,520	\$248,346	\$260,763

Source: Forrester Research, Inc.



Savings From Lower Total Cost Of Goods

A core benefit that the interviewed provider noted was the ability for the organization to buy smarter and reduce the total cost of goods. Using NuVia, the organization was able to clean up its item master and use clean data to align to the proper contracts and respective vendors. Following up on this, the organization would use CCXpert to ensure that the correct contract price was used, that contract use was maximized and orders were routed to the most optimal contract, be it a GPO or a local contract. For suppliers not on the GHX network, MetaTrade takes this optimized item and contract data and makes it possible to transact with them at the optimal, and often lower, pricing.

On a three-year analysis, the organization saved a PV of \$3,033,060 from data standardization, contract alignment/verification, and contract use with non-GHX vendors.

TABLE 14
Savings From Lower Total Cost Of Goods

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
C1	Total annual purchase volume			\$216,000,000	\$226,800,000	\$238,140,000
C2	Purchases through GHX via Exchange and MetaTrade			98%	98%	98%
C3	Percentage of orders detected to have discrepancies			15%	15%	15%
C4	Erroneous pricing correction enabled by CCXpert			1%	1%	1%
C5	Percentage of items reviewed for product standardization for units of measurement and product type			20%	20%	20%
C6	Savings realized through NuVia standardization			2%	2%	2%
Ct	Savings from lower total cost of goods	$(C1 \cdot C2 \cdot C3 \cdot C4) + (C1 \cdot C2 \cdot C5 \cdot C6)$	\$0	\$1,164,240	\$1,222,452	\$1,283,575
	Risk adjustment	0%				
Ctr	Savings from lower total cost of goods (risk-adjusted)		\$0	\$1,164,240	\$1,222,452	\$1,283,575

Source: Forrester Research, Inc.



Savings From Integrated Electronic Invoicing

Following the introduction of GHX, paper invoices became a thing in the past. OnDemand AP, a GHX module, electronically receives invoices and reconciles the invoices against purchase orders for quick processing. As a result, the pace at which the provider handled the workflow was drastically increased, enabling the organization to take advantage of early-pay discounts when it felt that it had adequate cash flow. Altogether, with the cost of paper invoice entry, reconciliation, and early-pay discounts, the provider saved an estimated \$2,876,696 PV, over three years.

TABLE 15
Savings From Integrated Electronic Invoicing

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
D1	Total annual purchases through GHX			\$211,680,000	\$222,264,000	\$233,377,200
D2	Percentage of purchases paid early for 2% discount			25%	25%	25%
D3	Realized 2% early-pay discount	$D1 \times D2 \times 2\%$		\$1,058,400	\$1,111,320	\$1,166,886
D4	Paper invoice entry cost reduced with ODAP, single AP clerk			48,000	48,000	48,000
Dt	Savings from integrated electronic invoicing	$D3 + D4$	\$0	\$1,106,400	\$1,159,320	\$1,214,886
	Risk adjustment	0%				
Dtr	Savings from integrated electronic invoicing (risk-adjusted)		\$0	\$1,106,400	\$1,159,320	\$1,214,886

Source: Forrester Research, Inc.



Infrastructure And Consumable Cost Savings

Handling the number of purchases that the interviewed provider conducts daily is a large undertaking — and implementing GHX saved this provider from having to establish multiple EDI connections, through intermediaries or direct with suppliers. The alternate solution of many disparate EDI solutions requires significant setup and maintenance costs, without the benefit of a consolidated platform to truly optimize the procurement workflows. Faxes and paper trails would still be necessary in this alternate scenario. For the purpose of quantifying this value, we conservatively estimated the costs associated with ten additional EDI connections, although this would likely not reach the number of suppliers currently enabled through the GHX exchange. The cost of infrastructure and consumables total \$820,962 PV, or \$281,942 more than what the GHX solution cost over the same time horizon.

TABLE 16
Infrastructure And Consumable Cost Savings

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
E1	Number of alternate EDIs necessary		10			
E2	IT hours required to establish individual EDIs, inclusive of EDI mapping, ERP integration, implementation		80			
E3	EDI hardware costs: dedicated		\$40,000	\$4,000	\$4,000	\$4,000
E4	EDI software/translator software costs		\$90,000			
E5	Annual EDI maintenance and monitoring, hours required per connection	12 hours monthly * 12 months		144	144	144
E6	Cost of internal IT labor, per hour, fully loaded		\$50	\$50	\$50	\$50
E7	Cost of EDI maintenance averted			\$112,000	\$112,000	\$112,000
E8	Cost of alternate EDI setup	$(E2 * E6) + (E1 * E3) + E4$	\$530,000	\$0	\$0	\$0
E9	Paper and related consumables reduction savings: paper, fax machines, toner			\$5,000	\$5,000	\$5,000
Et	Infrastructure and consumable cost savings	$E7 + E8 + E9$	\$530,000	\$117,000	\$117,000	\$117,000
	Risk adjustment	0%				

Etr	Infrastructure and consumable cost savings (risk-adjusted)	\$530,000	\$117,000	\$117,000	\$117,000
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Source: Forrester Research, Inc.

Total Provider Benefits

Table 17 shows the total of all benefits across the five areas listed above, as well as present PVs discounted at 10%. Over three years, the provider organization expects risk-adjusted total benefits to be a PV of more than \$7.5 million.

TABLE 17
Total Provider Benefits (Risk-Adjusted)

Ref.	Benefit Category	Initial	Year 1	Year 2	Year 3	Total	Present Value
Atr	Reduced buyer intervention/effort for discrepant orders	\$0	\$80,547	\$84,574	\$88,803	\$253,924	\$209,839
Btr	Reduced buyer effort for simple order entry (non-discrepant)	\$0	\$236,520	\$248,346	\$260,763	\$745,629	\$616,178
Ctr	Savings from lower total cost of goods	\$0	\$1,164,240	\$1,222,452	\$1,283,575	\$3,670,267	\$3,033,060
Dtr	Savings from integrated electronic invoicing	\$0	\$1,106,400	\$1,159,320	\$1,214,886	\$3,480,606	\$2,876,696
Etr	Infrastructure and consumable cost savings	\$530,000	\$117,000	\$117,000	\$117,000	\$881,000	\$820,962
	Total benefits (risk-adjusted)	\$530,000	\$2,704,707	\$2,831,692	\$2,965,027	\$9,031,426	\$7,556,735

Source: Forrester Research, Inc.

PROVIDER COSTS

The interviewed provider organization experienced a number of costs associated with the Exchange Platform solution:

- › Software and module costs.
- › Implementation and integration costs.

These represent the mix of internal and external costs experienced by the interviewed organization for initial planning, implementation, and ongoing maintenance associated with the solution. Readers should note that costs and benefits have been compacted to a three-year time horizon to better represent the actual scenario of adopting the GHX platform at an organization. Costs are extrapolated estimations based upon the information/metrics provided by the provider but may differ slightly from the actual costs.



Software And Module Costs

Software costs to the provider interviewed consisted of the core GHX Platform as well as added modules that further increased functionality. Subscription costs are recurring and are largely fixed for the Exchange Platform and most modules, all of which are assessed annually. Maintenance and support are included within the cost of subscription. Accounting for an annual growth rate of 3% within the organization, we calculate the total software and module cost to be \$539,020 over three years, PV.

TABLE 18

Software And Module Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
F1	GHX Exchange core and module cost: recurring			\$204,630	\$204,630	\$204,630
F2	Annual provider volume growth			5%	5%	5%
Ft	Software and module costs	$F1 \cdot (1+F2)^n$ year of growth	\$0	\$214,862	\$225,605	\$236,885
	Risk adjustment	0%				
Ftr	Software and module costs (risk-adjusted)		\$0	\$214,862	\$225,605	\$236,885

Source: Forrester Research, Inc.



Implementation And Integration Costs

The provider interviewed had a small team assigned to procurement, and as a result, the cost of change management and training was negligible. Likewise, IT resources within the organization were also limited. Implementation and integration with existing software required professional services and was assessed only once during the initial implementation period. Total implementation and transitional costs were \$317,300, inclusive of both internal and external costs.

Implementation costs are more variable from organization to organization in the provider space, especially since many of these costs are not assessed by GHX. Considering that some organizations outsource and some manage implementation in-house, depending on their own level of readiness and procurement maturity, the costs for a full transition to the Exchange Platform could vary. To compensate, we risk-adjusted this cost up by 10%.

The risk-adjusted cost of implementation and integration over the three years was \$349,030. See the section on Risks for more detail.

TABLE 19
Implementation And Integration Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
G1	Implementation and integration costs		\$294,500			
G2	Internal process development (in hours)	2 FTE * 240 hours	480			
G3	Change management and training (in hours)	14 FTE * 20 hours	280			
G4	Buyer/purchasing agent FTE hourly cost, fully loaded		\$30	\$30	\$30	\$30
Gt	Implementation and integration costs	$G1+(G2+G3)*G4$	\$317,300	\$0	\$0	\$0
	Risk adjustment	↑10%				
Gtr	Implementation and integration costs (risk-adjusted)		\$349,030	\$0	\$0	\$0

Source: Forrester Research, Inc.

Total Provider Costs

Table 20 shows the total of all costs as well as associated present values, discounted at 10%. Over three years, the provider organization expects costs to total a present value of \$888,050.

TABLE 20
Total Provider Costs (Risk-Adjusted)

Ref.	Cost Category	Initial	Year 1	Year 2	Year 3	Total	Present Value
Ftr	Software and module costs	\$0	(\$214,862)	(\$225,605)	(\$236,885)	(\$677,351)	(\$559,754)
Gtr	Implementation and integration costs	(\$349,030)	\$0	\$0	\$0	(\$349,030)	(\$349,030)
	Total costs (risk-adjusted)	(\$349,030)	(\$214,862)	(\$225,605)	(\$236,885)	(\$1,026,381)	(\$908,784)

Source: Forrester Research, Inc.

FLEXIBILITY

Flexibility, as defined by TEI, represents an investment in additional capacity or capability that could be turned into business benefit for some 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. There are multiple scenarios in which a customer might choose to implement the Exchange Platform and later realize additional uses and business opportunities. Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in Appendix A).

The interviewed provider stated that one of the most important aspects of the GHX platform was that it was forward-looking, in that it brought together suppliers and vendors onto a single platform to enable visibility and efficiency for all. Given the number of the provider’s suppliers that are on the GHX exchange and/or available via Metatrade, only 4 percent make up the remaining vendor landscape. With this convergence onto GHX, we expect the overall vendor utilization of GHX for commerce with other customers to increase, making for even greater gains moving forward.

Similar to the supplier we interviewed, we believe ***an investment in the GHX Platform will provide a future benefit to the provider if the organization opts to change trading partners and/or GPOs. GHX’s leading market presence ensures data interoperability/compatibility with a tremendous network of trading partners.*** And unlike direct EDI connections to single partners, the GHX solution enables organizations to establish new business relationships without adding significant incremental cost.

As the leader in healthcare supply chain exchange platform, GHX can ensure opportunities to work with an enormous amount of trading partners, should there be a need to explore new trading options.

RISKS

Forrester defines two types of risk associated with this analysis: “implementation risk” and “impact risk.” Implementation risk is the risk that a proposed investment in the Exchange Platform may deviate from the original or expected requirements, resulting in higher costs than anticipated. Impact risk refers to the risk that the business or technology needs of the organization may not be met by the investment in Exchange Platform, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for cost and benefit estimates.

Quantitatively capturing implementation risk and impact risk by directly adjusting the financial estimates results provides more meaningful and accurate estimates and a more accurate projection of the ROI. In general, risks affect costs by raising the original estimates, and they affect benefits by reducing the original estimates. The risk-adjusted numbers should be taken as “realistic” expectations since they represent the expected values considering risk.

The following impact risks that affect benefits are identified as part of the analysis:

- › Reduced buyer intervention/effort for discrepant orders benefit is wholly dependent upon the maturity of the provider’s procurement process. Some organizations have a higher level of order automation and have a lower rate of discrepant orders. As NuVia and CCXpert can correct items and align contracts, correct orders are more likely to occur than even in other electronic environments. A 10% risk adjustment has been assigned to err on the side of conservatism.
- › Reduced buyer effort for simple order entry has also been risk-adjusted as some organizations could already be using technology that performs some level of automation, such as OCR, email import, and EDI intermediaries. While these other methods only perform some of the functionality of GHX, they nevertheless can reduce the potential gain experienced by some organizations.

The following implementation risk that affects costs is identified as part of this analysis:

- › Implementation and integration costs could be higher for some providers, especially for a smaller operation that is less prepared for electronic procurement automation. Costs of implementation and change management alike would be a higher proportion of overall costs in these scenarios, and readers are advised to apply their own adjustment.

Table 21 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates for the interviewed organization. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

TABLE 21
Benefit And Cost Risk Adjustments

Benefits	Adjustment
Reduced buyer intervention/effort for discrepant orders	↓ 10%
Reduced buyer effort for simple order entry	↓ 10%
Costs	Adjustment
Implementation and integration costs	↑ 10%

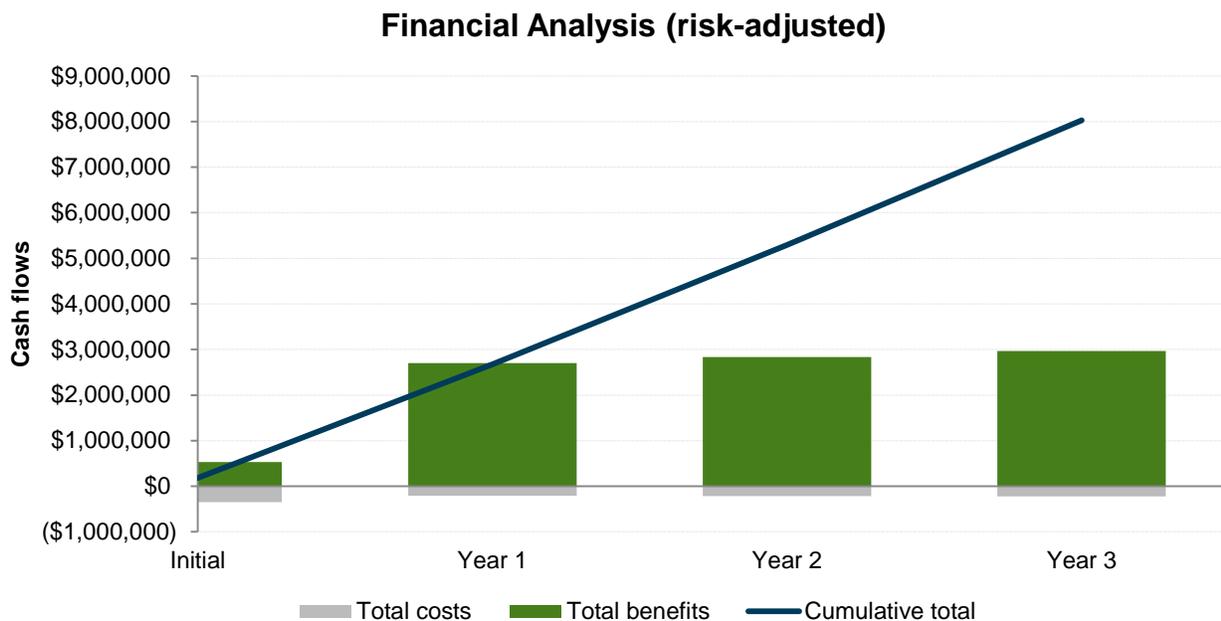
Source: Forrester Research, Inc.

Healthcare Provider 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 interviewed provider organization's investment in Exchange Platform.

Table 22 below shows the risk-adjusted ROI, NPV, and payback period values. These values are determined by applying the risk-adjustment values from Table 21 in the Risk section to the unadjusted results in each relevant cost and benefit section.

FIGURE 6
Cash Flow Chart (Risk-Adjusted)



Source: Forrester Research, Inc.

TABLE 22
Provider Cash Flow (Risk-Adjusted)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Costs	(\$349,030)	(\$214,862)	(\$225,605)	(\$236,885)	(\$1,026,381)	(\$908,784)
Benefits	\$530,000	\$2,704,707	\$2,831,692	\$2,965,027	\$9,031,426	\$7,556,735
Net benefits	\$180,970	\$2,489,845	\$2,606,088	\$2,728,142	\$8,005,045	\$6,647,951
ROI						732%
Payback period						< 6 months

Source: Forrester Research, Inc.

GHX Supplier / Provider Relationship Analysis

ORGANIZATIONAL CHARACTERISTICS

For this study, Forrester conducted in-depth interviews with representatives from a healthcare provider organization and a healthcare manufacturer that are both GHX customers. Some high-level characteristics of the interviewed organization are as follows:

- › The provider is a hospital with roughly 800 beds and over 1,400 physicians.
- › The provider employs approximately 8,000 FTEs and has an annual budget of roughly \$1.5 billion.
- › The provider and supplier transact with one another as trading partners across the GHX network.
- › The supplier is a publicly listed multinational healthcare goods supplier / manufacturer with over 14,000 employees.
- › The supplier had US revenues of \$2.3 - \$2.5 billion from the 2012 to 2014 period, which this study is focused upon.
- › The supplier works with buyers ranging from individual practitioners and hospitals to extended-care facilities and distributors, through a variety of channels, both before and after the implementation of GHX.

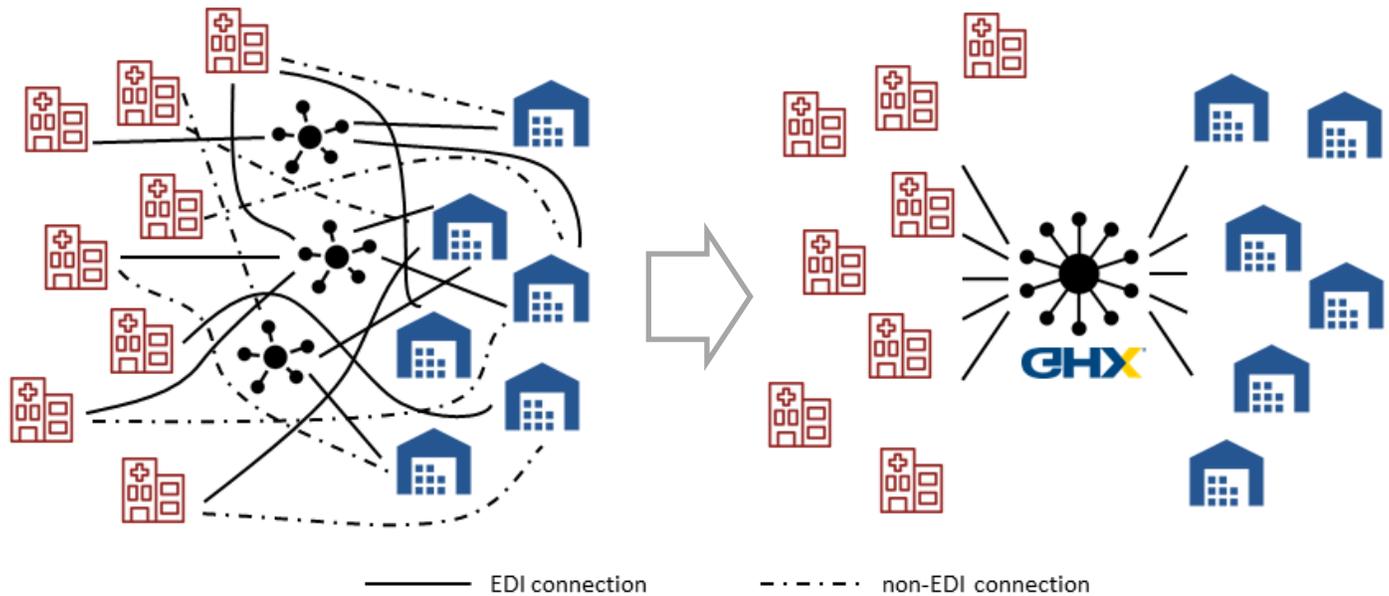
Situation

Prior to the deployment of GHX, the supplier and provider interviewed had both relied on a combination of EDI and manual order processing to manage their order fulfillment, a process that required significant manual workflows and intervention to complete. In moving to GHX, a centralized hub for suppliers and providers alike, the supplier and provider both reduced their dependence on Value-Added-Network (VAN) intermediaries and manually received orders, streamlining their collection of procurement/fulfillment workflows. To accomplish this, the organizations implemented GHX and described it as a deployment similar to a new EDI. Both the provider and supplier already possessed the capability to take electronic orders so the initial migration to GHX was a smooth transition for both parties. Integration with existing systems was also a straight forward step, with professional services from GHX providing the insight to bridge the data connection between ERP and the Exchange Platform.

Existing processes were reformulated and new processes were formed over time to leverage the value-add features of the GHX solution, with some modules requiring slightly more effort than others. G-Fax for instance was noted by the supplier as one of their more recent feature implementations and required the denotation of various purchase order or price request forms so that optical character recognition could be optimized. Being that the supplier maintained a relationship with thousands of providers, this was a lengthy process. The providers too, spent significant time in process engineering to better leverage GHX. Again, this was a lengthy process, but effectively took their buying prowess to a new level by enabling the organization's ability to negotiate based on uniformly accurate data.

Our findings overall indicate that a deeper level of usage of the GHX solutions and its feature set requires a lengthier ramp up and initial process reorganization period, but produces significantly higher long term benefits. At a very basic level, GHX rationalizes and simplifies the healthcare supply chain, delivering value across the entire supply chain landscape with a feature rich central connection.

FIGURE 7
Consolidating The Healthcare Supply Chain with GHX



Source: Forrester Research, Inc.

RESULTS

Drivers

The interviews revealed primary drivers of the GHX solution to be:

- **Data uniformity and accuracy.** GHX cleans master data sets and maintains the uniformity throughout the supply chain process. This aligned and synchronized data provided the ground work for orders to be processed electronically, making for exceptional accuracy from the time that orders were quoted to the point of invoicing and payment receipt.
- **Single point / centralized data.** Better decision making was made possible through a central consolidated dashboard of data, resulting in faster and more accurate reporting. Data aggregation, formatting, and alignment were not necessary with GHX serving as the central transactional platform.
- **One-to-many relationship and market presence.** Using GHX as the central connection for all parties, reducing the need for multiple VANs to achieve adequate reach. In fact, GHX extended the reach of organizations significantly, with available connections numbering in the thousands.
- **Backwards compatibility.** For organizations that have relationships with those that are not on the GHX network, the functionality of G-Fax and MetaTrade enable backwards compatibility by converting manual orders into structured electronic data. GHX eInvoicing extends further compatibility for suppliers that want electronic invoice record keeping and AR visibility for its providers that do not yet have EDI capability.

THE GHX PLATFORM CONSOLIDATES THE MAJORITY OF HEALTHCARE SUPPLIERS AND PROVIDERS INTO A SINGLE NETWORK TO PROVIDE UNPARALLELED REACH

The interviewed provider stated that one of the most important aspects of the GHX platform was that it was forward-looking, in that it brought together suppliers and vendors onto a single platform to enable visibility and efficiency for all. Given the number of the provider's suppliers that are on the GHX exchange and/or available via Metatrade, only 4 percent make up the remaining vendor landscape. Organizations spend an inordinate amount of time integrating networks and partners to operate an efficient supply chain. With this convergence towards GHX, uncertainties and integration work is minimized by subtracting complexities and superfluous integrations from the supply chain.

Similarly in the supplier setting, GHX's leading market presence ensures data interoperability/compatibility with a tremendous network of trading partners. And unlike direct EDI connections to single partners, the GHX solution enables organizations to establish new business relationships without adding significant incremental cost. The scale of the GHX network is by orders of magnitude greater than most other intermediary network operators. While GHX provides benefits to mid to larger size organizations the most, smaller providers and practitioners should note that there are features within the GHX portfolio that can help smaller organizations automate portions of the procurement process on the GHX network, all without having to accrue significant incremental costs.

Benefits

On the Exchange Platform, both the supplier and provider experienced efficiency gains in multiple segments of the supply chain. Order processes became easier and quicker to complete, while invoicing was streamlined and passed through the organizations with minimal intervention. Automation across the supply chain was enabled – allowing the organizations to scale easily while keeping costs in check. With data accuracy being a key driver, the provider noted that it was buying smarter, reducing the hospital's total cost of goods by over \$3 million over the course of three years. Similarly for the supplier, the accuracy of the data facilitated the reduction of incorrect orders and customer disputes. For the category of write-offs from customer disputes alone, the supplier saved nearly \$8 million over three years. And while these organizations were leading the pack in automation with GHX, they still retained backwards compatibility with trading partners that were not on the GHX network. Stated the VP of supply chain and finance at the provider organization, *"GHX looks beyond just standard EDI transmission; their solution is forward looking and built for the whole picture."*

Following the implementation of GHX, the interviewed supplier experienced the following benefits:

- › **Customer service personnel receiving orders became more efficient due to automation enabled by GHX.** The level of automated orders transacted through GHX and the associated G-Fax module rose to 92% of total orders, drastically reducing the number of orders that required manual entry. As a result, 4 minutes per order were saved, across approximately 900,000 purchase orders annually, freeing customer service agents to allocate their time to other value-producing tasks. Total present value (PV) benefit was \$2,702,405 over a three year horizon.
- › **Increased order acceptance accuracy reduced FTE efforts to remediate and correct orders.** With a significant improvement in order accuracy with the GHX Platform and the Order Intelligence Module, data is aligned from buyers and corrected for errors prior to upload into ERPs to avoid discrepancies and manual intervention. Our research indicates that nearly 15% of manually processed orders would contain some type of error, which were now alleviated at an earlier point in the order process with GHX. Total PV benefit was \$1,795,076 over three years.
- › **Write-offs and customer disputes were reduced.** Invariably, customers disputed some invoices due to erroneous invoicing or problematic purchase orders, resulting in write-offs at the supplier. Following the adoption of GHX, the

accuracy of PO intake and invoicing improved, reducing client invoice disputes and the associated write-offs. Write-off savings over a three-year period amounted to \$7,828,335.

- › **Having transitioned the majority of its order intake to GHX, the supplier was not only invoicing customers more accurately, but also more efficiently.** Days sales outstanding (DSO), or the measure of time until an order is paid, improved by 1.5 days on a 30-day cycle. Measuring the improved available cash flow against a conservative weighted average cost of capital minus early-pay discounts equated to a three-year benefit of \$6,434,248 PV.
- › **The supplier avoided establishing and maintaining a number of EDI connections.** To efficiently connect to many of its large distributors and buyers, this supplier would have needed more than 20 direct EDI connections and numerous one-to-many intermediaries to adequately serve its client partners, which is now unnecessary with the GHX Platform. Each separate EDI connection carries a set-up cost as well as maintenance resources. Conservative estimates suggest that 20 separate EDI connections are insufficient to carry out the scale of the supplier's current fulfillment levels. As a result, a conservative estimate of the savings realized by not having to go the disparate EDI route is \$1,527,055 PV.

The interviewed provider organization experienced the following benefits after implementation of GHX:

- › **Following the standardization of data and electronic automation of orders with GHX, discrepant orders dropped from 15% of total orders to 1.1%.** The time savings realized by purchasing agents totaled over 9,404 hours over a three-year period, or the equivalent of \$209,839 in present value terms after risk-adjustment.
- › **Order entry automation saved manual worker costs.** As purchase orders could now be automated for most standard items, these orders no longer required the intervention and manual entry that they had previously. Accurate item lists and contract alignment played a large part so that the orders went to the proper vendors in an automated fashion. Savings amounted to \$616,178 PV over three years.
- › **Better item master accuracy and enrichment and contract price alignment led to smarter purchasing, in both better negotiation and sourcing from those vendors offering best contractual terms.** Additionally, MetaTrade enabled cross-alignment of purchases with contracts even if a vendor was not a part of the GHX network. The organization saw a significant reduction in the total cost of goods, to the tune of \$3,033,060 over three years.
- › **Faster electronic invoicing with a lower error rate made for much faster invoice processing, enabling early-payment discounts when available.** Manual entry of invoices was now a thing of the past, and along with that process went errors. Invoices were fully electronic and easily reconcilable with purchase orders. Due to the increased efficiency, the organization processed invoices faster and was able to take advantage of quick-pay for discounts on a more frequent basis. Savings in this category were \$2,876,696 PV.
- › **The transition to GHX circumvented infrastructure and consumable costs.** To reasonably handle purchase order volumes required by the provider, significant EDI investments would have had to be made. Conservatively, we estimate a minimum of 10 disparate intermediary one-to-many providers and direct EDI connections would be necessary for the organization, although still not enough to achieve the trading partner enablement provided by GHX. Accounting for EDI set-up fees and maintenance, and then adding consumable costs of toner, paper, etc., the organization avoided costs of \$820,962 PV.

Based on the interview data points collected, Forrester constructed a TEI framework and an associated ROI analysis that illustrates the areas financially affected. Table 23 below reflects the derived risk-adjusted and combined ROI of a supplier and provider transacting as trading partners on the GHX network.

TABLE 23
GHX Supplier / Provider Relationship Cash Flow (Risk-Adjusted)

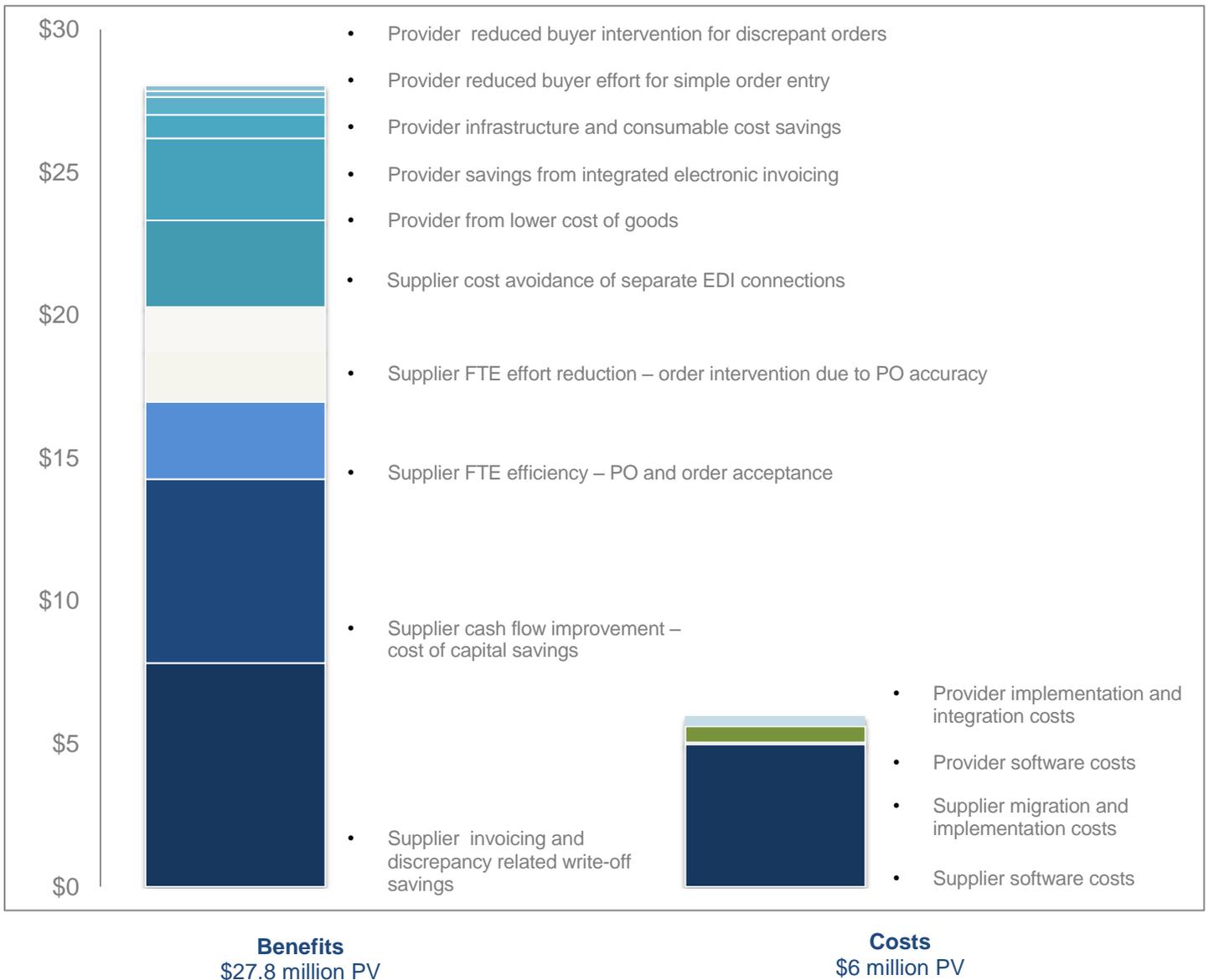
	Initial	Year 1	Year 2	Year 3	Total	Present Value
Costs	(\$2,352,230)	(\$214,862)	(\$2,131,105)	(\$2,199,550)	(\$6,897,746)	(\$5,961,356)
Benefits	\$1,500,000	\$10,083,739	\$10,619,661	\$11,180,719	\$33,384,118	\$27,843,854
Net benefits	(\$852,230)	\$9,868,878	\$8,488,556	\$8,981,169	\$26,486,372	\$21,882,498
Combined ROI						367%

Source: Forrester Research, Inc.

GHX Supplier / Provider Relationship Financial Summary

The financial results calculated in the Benefits and Costs sections of the interviewed supplier and provider can be used to determine the ROI, NPV, and payback period for a cumulative view of a two way relationship that have made an investment in the Exchange Platform. A breakout of the relative benefits and costs categories used to obtain the summary results is shown below in Figure 8.

FIGURE 8
Present Value (PV) of Individual Benefit and Cost Categories



Source: Forrester Research, Inc.

GHX Platform: Overview

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

GHX automates the healthcare supply chain, increasing visibility into information and providing business intelligence tools that help customers make smarter, better and faster decisions. Through supply chain automation, efficiency and accuracy, GHX helps customers increase their operational efficiency and drive down their costs of doing business.

As a healthcare technology company, GHX helps hospitals and the suppliers they work with increase efficiency, lower costs and improve visibility to purchasing data, which can ultimately, provide better patient care. With the largest footprint in the healthcare supply chain, GHX delivers software-as-a-service (SaaS) technology and strategic healthcare consulting services that help customers optimize their supply chain processes. As a result, transactions move faster. Visibility into supply chain data improves. Hard-dollar savings are realized. Resources can be reallocated, driven by the dramatic improvements in efficiency.

GHX offers:

- An open and neutral electronic trading exchange
- Procurement and payment automation
- Content, contract and inventory management
- Business intelligence and reporting
- Standards enablement and data synchronization
- Vendor credentialing and management

PROVIDING AN OPEN AND NEUTRAL BRIDGE AMONG TRADING PARTNERS

The GHX platform provides an open and neutral bridge between healthcare providers and the manufacturing and distribution organizations that support them. More than 4,100 healthcare providers and 400 manufacturer divisions in North America and another 1,500 provider organizations and 350 suppliers in Europe do business electronically through the GHX platform. As trading partners, they form the largest community in healthcare, working together to streamline the purchasing and delivery of medical-surgical products.

SUPPLIER SOLUTIONS

Healthcare providers—the suppliers' end users—want to do business with suppliers through electronic data interchange (EDI) because it's fast, accurate and efficient. The more business providers conduct electronically, the lower their operational costs. Suppliers must transact through EDI to achieve preferred vendor status.

The benefits work both ways. GHX e-commerce solutions not only help suppliers become a preferred vendor, they significantly help drive down supplier operational costs as well. The effort required to manage and fill orders is reduced by up to 75%, from \$20 to \$5 per order, on average.

GHX drives down discrepancy rates and optimizes the order-to-cash cycle as data is exchanged quickly and accurately, helping reduce DSOs by up to 30%.

GHX solutions for suppliers include:

- e-Commerce automation
- Master data management
- Pricing alignment
- Automated payment and reconciliation

- Order-to-cash optimization services
- UDI data distribution
- Credentialing tools and services

PROVIDER SOLUTIONS

For healthcare providers, supply chain is the second largest and fastest growing expense—only labor costs more. Optimization isn't just about ordering electronically, however. It's about matching contract pricing to order pricing, keeping the data item master clean and current, and validating that product and trading partner information is accurate.

GHX provider solutions not only automate ordering, they automate the process of maintaining the critical data that efficient ordering depends on, driving substantial opportunities for savings

GHX solutions for providers include:

- Purchasing automation
- Contract and price management
- Item master management
- Requisition and workflow control
- Invoice payment and automation
- Sourcing and vendor management
- Credentialing management

Appendix A: Total Economic Impact™ Overview

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. TEI assists technology vendors in winning, serving, and retaining customers.

The TEI methodology consists of four components to evaluate investment value: benefits, costs, flexibility, and risks.

BENEFITS

Benefits represent the value delivered to the user organization — IT and/or business units — by the proposed product or project. Often, product or project justification exercises focus just on IT cost and cost reduction, leaving little room to analyze the effect of the technology on the entire organization. The TEI methodology and the resulting financial model place 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. Calculation of benefit estimates involves a clear dialogue with the user organization to understand the specific value that is created. In addition, Forrester also requires that there be a clear line of accountability established between the measurement and justification of benefit estimates after the project has been completed. This ensures that benefit estimates tie back directly to the bottom line.

COSTS

Costs represent the investment necessary to capture the value, or benefits, of the proposed project. IT or the business units may incur costs in the form of fully burdened labor, subcontractors, or materials. Costs consider all the investments and expenses necessary to deliver the proposed value. In addition, the cost category within TEI captures any incremental costs over the existing environment for ongoing costs associated with the solution. All costs must be tied to the benefits that are created.

FLEXIBILITY

Within the TEI methodology, direct benefits represent one part of the investment value. While direct benefits can typically be the primary way to justify a project, Forrester believes that organizations should be able to measure the strategic value of an investment. Flexibility represents the value that can be obtained for some future additional investment building on top of the initial investment already made. For instance, an investment in an enterprise-wide upgrade of an office productivity suite can potentially increase standardization (to increase efficiency) and reduce licensing costs. However, an embedded collaboration feature may translate to greater worker productivity if activated. The collaboration can only be used with additional investment in training at some future point. However, having the ability to capture that benefit has a PV that can be estimated. The flexibility component of TEI captures that value.

RISKS

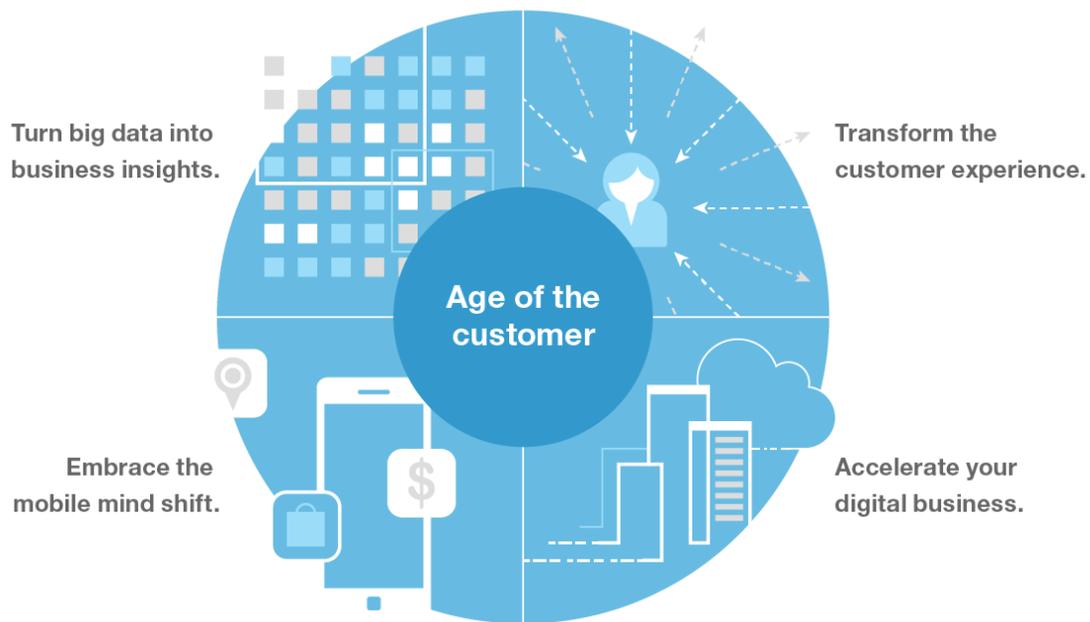
Risks measure the uncertainty of benefit and cost estimates contained within the investment. Uncertainty is measured in two ways: 1) the likelihood that the cost and benefit estimates will meet the original projections, and 2) the likelihood that the estimates will be measured and tracked over time. TEI risk factors are based on a probability density function known as "triangular distribution" to the values entered. At a minimum, three values are calculated to estimate the risk factor around each cost and benefit.

Appendix B: Forrester And The Age Of The Customer

Your technology-empowered customers now know more than you do about your products and services, pricing, and reputation. Your competitors can copy or undermine the moves you take to compete. The only way to win, serve, and retain customers is to become customer-obsessed.

A customer-obsessed enterprise focuses its strategy, energy, and budget on processes that enhance knowledge of and engagement with customers and prioritizes these over maintaining traditional competitive barriers.

CMOs and CIOs must work together to create this companywide transformation.



Forrester has a four-part blueprint for strategy in the age of the customer, including the following imperatives to help establish new competitive advantages:



Transform the customer experience to gain sustainable competitive advantage.



Accelerate your digital business with new technology strategies that fuel business growth.



Embrace the mobile mind shift by giving customers what they want, when they want it.



Turn (big) data into business insights through innovative analytics.

Appendix C: Glossary

Discount rate: The interest rate used in cash flow analysis to take into account the time value of money. Companies set their own discount rate based on their business and investment environment. Forrester assumes a yearly discount rate of 10% for this analysis. Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult their respective organizations to determine the most appropriate discount rate to use in their own environment.

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.

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.

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.

Return on investment (ROI): A measure of a project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits minus costs) by costs.

A NOTE ON CASH FLOW TABLES

The following is a note on the cash flow tables used in this study (see the example table below). The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1. Those costs are not discounted. All other cash flows in years 1 through 3 are discounted using the discount rate (shown in the Framework Assumptions section) at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations are not calculated until 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.

TABLE [EXAMPLE]
Example Table

Ref.	Metric	Calculation	Year 1	Year 2	Year 3

Source: Forrester Research, Inc.

Appendix D: Endnotes

¹ Forrester risk-adjusts the summary financial metrics to take into account the potential uncertainty of the cost and benefit estimates. For more information, see the section on Risks.

² Forrester has condensed the time frame of this study to three years, as it was necessary to capture the initial costs and benefits of the long time supplier customer of GHX.