

The Total Economic Impact™ Of Pricer

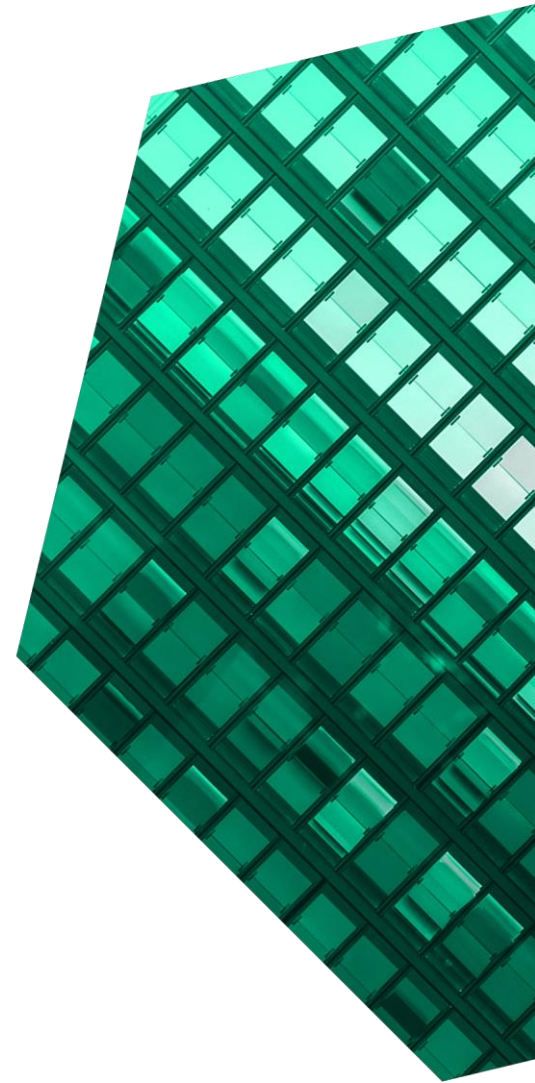
Cost Savings And Business Benefits Of In-Store
Digitalization Enabled By Pricer's Electronic Shelf
Labeling System

DECEMBER 2022

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Executive Summary

Retailers today are facing unique cost pressures. Increasing manufacturing, supply chain, and labor costs are infringing on margins, and to maintain profitability, they also need to keep a close eye on their prices. Digitalization and automation of store technologies are an opportunity for them to modernize store operations, enabling them to address operational challenges.

Pricer provides scalable in-store communications solutions that enable retailers to engage with shoppers, staff, and brands. Based on electronic shelf labels (ESL) and digital signage, its solutions enable in-store processes such as advanced price automation, guided navigation in stores, click and collect/pick, and light and rapid replenishment.

Pricer commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) retailers may realize by deploying its ESLs. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Pricer on their organizations.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed three representatives with experience implementing and using Pricer ESL in their grocery retail businesses.

Prior to the investment in ESL, these interviewees noted that stores were using paper labels that were cumbersome and time-consuming to replace, which led to labor inefficiencies and frequent pricing inconsistencies.

With Pricer, the interviewees' organizations saw significant time savings, not only from the automation of price labeling but also in other inventory-related tasks, such as picking for online orders or replenishing shelves. Other key benefits for retailers are pricing agility, centralized price changes, and a

KEY BENEFITS OVER FIVE YEARS



Return on investment (ROI)
277%



Benefits (PV)
\$130.68M



Payback period
18 months

reduction of store associates' time spent on non-value adding tasks.

For the purposes of this study, Forrester aggregated the interviewees' experiences and combined the results into a single composite organization that is representative of the interviewees' organizations — an omnichannel grocery retail chain with 500 stores. The quantified benefits and costs presented are based on this composite organization.

KEY FINDINGS

Quantified benefits. Five-year, risk-adjusted present value (PV) quantified benefits for the composite organization include:

- **Savings from price change automation.** The primary benefit of ESLs is the time savings from automated price changes. Store associates save significant time by not printing and sorting price labels, navigating around the store, and replacing the labels. Based on information provided by interviewees, the estimated time savings per price change for the composite organization is 2 minutes. With an estimated 3,000 price changes happening in a single store in a single week, this compounds to 5,200 hours of time saved in just one store. For the composite organization, this works out to cost/labor savings of \$69.67 million across its 500 stores over five years.



Annual time savings from automating price changes

5,200 hours per store

- **Improved e-commerce fulfilment efficiency with guided picking.** In recent years, especially since the pandemic began, grocery retailers have seen an acceleration towards online grocery shopping and click-and-collect. Retailers have had to introduce new in-store fulfilment operations alongside regular store operations. However, store associates often spend a lot of time finding the right products to pick for their orders. Flashing LED lights on Pricer's ESLs help to guide store pickers to the right products, which eliminates the guesswork as to where products are in a store. This guidance helps associates with the composite organization save 50% of their time when picking orders, roughly 15 seconds per item. This compounds into efficiency

savings of \$42.72 million over five years for the composite organization.



Time savings on product picking for online orders

- **Time savings on shelf replenishment.** The LED lights on Pricer's ESL can also be configured to guide shelf stockers to the right shelves when replenishing in-store stock. This is especially useful for products that are not always clearly labelled, like wine and fresh produce. The shelf stockers save approximately 35% of the time they typically spend navigating the store and locating the right shelf location for products, or 1 minute per product restocked. For the composite organization, this compounds into \$18.29 million across 500 stores over five years.

Additional unquantified benefits. Benefits that are not quantified in this study include:

- **Pricing agility.** Manually updating paper price labels is a labor-intensive task that took up a lot of store associates' time. Interviewees shared that the ability to quickly adjust prices helped them address volatile inflation and currency fluctuations concerns, and also minimize inventory wastage and write-offs on perishables.
- **Elimination of pricing errors.** As prices on labels are now synced with prices in the stores' point-of-sales systems, switching to ESL eliminated both technical and human pricing errors. This also means store managers spend less time handling customer complaints.
- **Enhanced shopping and brand experience.** Interviewees shared that using ESLs gave their stores a modern image that is more in line with

consumers' expectations. In addition, ESLs can display rich content about a product (e.g., country of origin, nutritional information, allergens, etc.) that provide shoppers with relevant information and enhance their shopping experience. The business manager at a Dutch grocery retailer shared that this helped to support their stores' efforts to branding themselves as part of a sustainable, socially responsible organization.

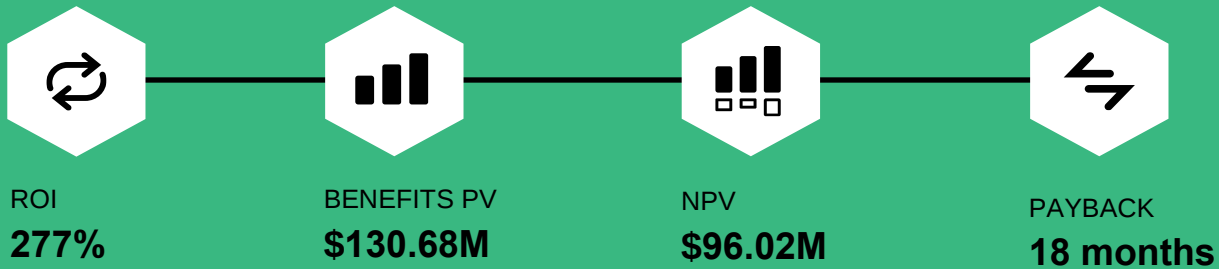
- **Reduced volatility from staff shortages and turnover.** Pricer ESL's guided picking and shelf replenishment use cases allowed retailers to quickly train and onboard new hires. As these associates can be quickly guided to the right shelves through an app and to the right product through flashing LED lights, they do not have to spend time getting familiarized with store layouts.

Costs. Five-year, risk-adjusted PV costs for the composite organization include:

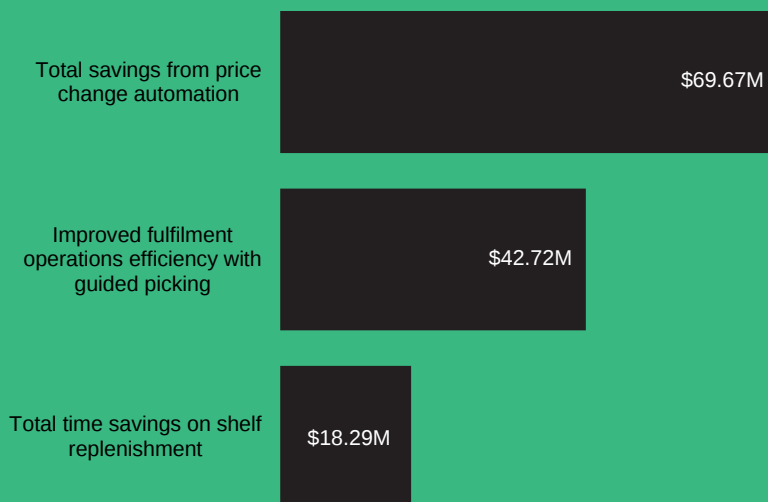
- **Hardware and installation costs.** The primary cost component for an ESL investment is the purchase of the labels. Based on information provided by interviewees, which was further validated with Pricer, the estimated hardware and installation costs for a typical supermarket is approximately \$83,000. For the composite organization, this compounds into \$29.87 million for 400 of its 500 stores transitioning in phases over five years.
- **Recurring license fees and ESL replacement costs.** Each store incurs \$2,700 in license fees yearly for their use of Pricer, and an estimated \$1,200 for replacing ESLs due to regular wear and tear. For the composite organization, this adds up to \$3.38 million over five years.
- **Project management costs.** To manage the implementation of the ESL system across all stores, the composite organization hires one project manager who works with individual store managers on the transition. These internal

project management costs add up to \$1.4 million over five years.

The representative interviews and financial analysis found that a composite organization experiences benefits of \$130.68 million over five years versus costs of \$34.67 million, adding up to a net present value (NPV) of \$96.02 million and an ROI of 277%.



Benefits Over Five Years



“Our investment in ESL has become crucial, especially as it is becoming harder to find and retain good staff. By simplifying the in-store processes, we can hire and train staff more quickly. With COVID-19, we had to [hire] more staff, but the process was so simple that anyone could collect the goods to fulfil e-commerce orders. This was a leg up against our competition and a better employee experience for the staff as well.”

— Business manager, Dutch grocery retailer

TEI FRAMEWORK AND METHODOLOGY

From the information provided in the interviews, Forrester constructed a Total Economic Impact™ framework for those organizations considering an investment in Pricer's ESL solution.

The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision. Forrester took a multistep approach to evaluate the impact that Pricer ESL can have on an organization.

DISCLOSURES

Readers should be aware of the following:

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

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

Pricer 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.

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



DUE DILIGENCE

Interviewed Pricer stakeholders and Forrester analysts to gather data relative to ESL.



INTERVIEWS

Interviewed three representatives at organizations using Pricer ESL to obtain data with respect to costs, benefits, and risks.



COMPOSITE ORGANIZATION

Designed a composite organization based on characteristics of the interviewees' organizations.



FINANCIAL MODEL FRAMEWORK

Constructed a financial model representative of the interviews using the TEI methodology and risk-adjusted the financial model based on issues and concerns of the interviewees.



CASE STUDY

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

The Pricer ESL Customer Journey

■ Drivers leading to the Pricer investment

Interviews			
Role	Region	Number of stores	Typical store size
Digital mobility and innovation manager	Headquartered in France	1,000+	25,000 to 45,000 SKUs
Business manager, shop floor operations	Headquartered in The Netherlands	250+	15,000 to 20,000 SKUs
Head of IT	Headquartered in Sweden	3	20,000 to 40,000 SKUs

KEY CHALLENGES

Prior to the investment in Pricer ESL, interviewees were all using paper-based price labels. They shared some common pain points about using the highly manual process, including:

- **Labor inefficiencies and waste of resources.** Store associates were wasting a lot of time not just on daily price label updates, but also on finding products' locations during e-commerce order picking or shelf replenishment.
- **Bottleneck in executing dynamic pricing.** The lack of labor and resources was a bottleneck in executing price updates in a timely manner. Interviewees shared that the immense effort required to update prices prevented them from doing so more regularly.

COMPOSITE ORGANIZATION

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an ROI analysis that illustrates the areas financially affected. The composite organization is representative of the three interviewees, and it is used to present the aggregate financial analysis in the next section. The composite organization has the following characteristics:

Description of composite. It is a grocery retail chain based in Europe, and it operates various store formats ranging from hypermarkets and supermarkets to convenience stores. It operates 500 stores and offers an average of 15,000 products in each. To keep up with shifting consumer behavior and trends, the organization is keen on growing its online sales through e-commerce and click-and-collect models.

Key Assumptions

- **500 grocery stores**
- **15,000 products per store**

Deployment characteristics. The organization intends to roll ESL out across all 500 stores. As that requires intensive upfront capital investments, the project is implemented in phases. This starts with a pilot for 50 stores in the first year.

ESLs are deployed throughout the whole store, although a common alternative approach is to deploy ESLs in areas that see the most price changes (e.g., fresh foods).

Analysis Of Benefits

■ Quantified benefit data as applied to the composite

Total Benefits								
Ref.	Benefit	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Present Value
Atr	Total savings from price change automation	\$4,420,000	\$11,050,000	\$19,890,000	\$28,730,000	\$35,360,000	\$99,450,000	\$69,672,819
Btr	Improved fulfillment operations efficiency with guided picking	\$1,841,667	\$5,294,792	\$10,960,219	\$18,206,141	\$25,768,692	\$62,071,510	\$42,720,048
Ctr	Total time savings on shelf replenishment	\$1,160,250	\$2,900,625	\$5,221,125	\$7,541,625	\$9,282,000	\$26,105,625	\$18,289,115
	Total benefits (risk-adjusted)	\$7,421,917	\$19,245,417	\$36,071,344	\$54,477,766	\$70,410,692	\$187,627,135	\$130,681,982

TOTAL SAVINGS FROM PRICE CHANGE AUTOMATION

Evidence and data. Interviewees all shared the same sentiment that the biggest benefit of ESLs is the time and resource savings from automating price changes. Before ESLs, store associates spent an average of 2 minutes updating one price label. This included time spent on printing and sorting paper labels, double-checking label accuracy, navigating around the store, and replacing the labels.

The number of price changes within a store varied depending on the store format and season, but the interviewees from the two large chain organizations shared that a typical supermarket expected an average of 3,000 price changes a week. This included changes that were regular, planned promotions, and ad-hoc.

The head of IT at a Swedish grocery retailer shared that pricing automation was crucial as it removed the mental barrier that store managers often had when it came to updating prices. Pricer allowed them to be more agile in their pricing strategies, which was necessary in a climate of inflation and volatile currency fluctuations.

“Our main objective with ESLs is to make these price changes more reliable and to be sure that we have the right price for the right product. Changing paper labels because of price changes every day is very tedious, so ESLs bring both reliability and time savings for in-store teams.”

Digital mobility and innovation manager, French grocery retailer

Modeling and assumptions. For the composite organization, Forrester assumes:

- Each store has 15,000 products.
- On average, there are 3,000 price or label changes happening across each store per week.
- Each change, if done manually, would have taken 2 minutes.
- The hourly wage of a store associate is \$20.

Risks. The total savings organizations may see from automating price might fluctuate based on:

- The size of the stores concerned and assortment of products in each store.
- The general pricing and promotion strategies employed.

Results. To account for these variances, Forrester adjusted this benefit downward by 15%, yielding a five-year, risk-adjusted total PV (discounted at 10%) of \$69.67 million.



Annual savings per store from automating price changes

\$104,000

Total Savings From Price Change Automation

Ref.	Metric	Source	Year 1	Year 2	Year 3	Year 4	Year 5
A1	Number of stores	Composite	500	500	500	500	500
A2	Percentage of stores digitalized with electronic shelf labels	Interviews	10%	25%	45%	65%	80%
A3	Number of stores digitalized with electronic shelf labels	A1*A2	50	125	225	325	400
A4	Average number of products per store	Interviews	15,000	15,000	15,000	15,000	15,000
A5	Average weekly number of price changes per store	20%*A4	3,000	3,000	3,000	3,000	3,000
A6	Total number of price changes per year	A3*A5*52	7,800,000	19,500,000	35,100,000	50,700,000	62,400,000
A7	Time taken to manually change paper labels (minutes)	Interviews	2.0	2.0	2.0	2.0	2.0
A8	Time savings from automating price changes (hours)	A6*A7/60	260,000	650,000	1,170,000	1,690,000	2,080,000
A9	Hourly wage of store associate	TEI standard	\$20	\$20	\$20	\$20	\$20
At	Total savings from price change automation	A8*A9	\$5,200,000	\$13,000,000	\$23,400,000	\$33,800,000	\$41,600,000
	Risk adjustment	↓ 15%					
Atr	Total savings from price change automation (risk-adjusted)		\$4,420,000	\$11,050,000	\$19,890,000	\$28,730,000	\$35,360,000
Five-year total: \$99,450,000			Five-year present value: \$69,672,819				

IMPROVED FULFILMENT OPERATIONS EFFICIENCY WITH GUIDED PICKING

Evidence and data. In recent years, especially since the pandemic began, grocery retailers have seen an acceleration towards online grocery shopping and click-and-collect. Interviewees shared that they often hired seasonal, short-term workers to run these in-store fulfilment operations. As they were unfamiliar with store layouts, these newly hired store associates would spend a lot of time finding the right products to pick for their orders. Flashing LED lights on Pricer's ESLs helped guide store pickers to the right products, which eliminated the guesswork as to where products are in a store and helped associates save 50% of their time when picking orders.

Interviewees shared that this was especially useful for product categories with product names and appearances that are quite similar, like alcohol, cheese, and produce.



Modeling and assumptions. For the composite organization, Forrester assumes:

- Each store fulfils about 250 online and click-and-collect orders per week. In line with general trends and a push towards online sales, the volume of online orders grows at 40% annually.
- Associates spent 30 seconds finding and picking each item in an order. With guidance and prompts from Pricer's flashing ESLs, they save 50% of their time on picking items.

Risks. The total efficiency gains organizations may realize from introducing guided picking can vary depending on:

- Staff efficiency and familiarity with stores
- Priority placed on online sales

Results. To account for these variances, Forrester adjusted this benefit downward by 15%, yielding a five-year, risk-adjusted total PV of \$42.72 million.

Improved Fulfilment Operations Efficiency With Guided Picking							
Ref.	Metric	Source	Year 1	Year 2	Year 3	Year 4	Year 5
B1	Number of online orders fulfilled per store per week	Interviews	250	288	331	380	437
B2	Average number of items per online order	Interviews	40	40	40	40	40
B3	Time spent on finding and picking each item (minutes)	Interviews	0.50	0.50	0.50	0.50	0.50
B4	Time saved with guided picking	Interviews	50%	50%	50%	50%	50%
B5	Time saved per order (minutes)	B2*B3*B4	10.0	10.0	10.0	10.0	10.0
B6	Total time savings with guided picking per year (hours)	B1*B5*A3/60	108,333	311,458	644,719	1,070,949	1,515,805
B7	Hourly wage of store associate	TEI standard	\$20	\$20	\$20	\$20	\$20
Bt	Improved fulfilment operations efficiency with guided picking	B1*B2*B3*B4	\$2,166,667	\$6,229,167	\$12,894,375	\$21,418,990	\$30,316,108
	Risk adjustment	↓15%					
Btr	Improved fulfilment operations efficiency with guided picking (risk-adjusted)		\$1,841,667	\$5,294,792	\$10,960,219	\$18,206,141	\$25,768,692
Five-year total: \$62,071,510			Five-year present value: \$42,720,048				

TOTAL TIME SAVINGS ON SHELF REPLENISHMENT

Evidence and data. Similar to LED-facilitated guided picking, Pricer ESL can also be configured to guide shelf stockers to the right shelves when replenishing in-store stocks. To avoid confusion when multiple product pickers or stockers are on the shop floor, Pricer ESL's LED lights can be configured to flash in different colors.

Interviewees shared that their organizations' associates typically spent 3 minutes navigating stores and finding product locations. With Pricer's system to guide them around the store, associates now spent 35% less time when replenishing shelves, or a reduction of 1 minute per product restocked.

The interviewee at a French grocery retailer also shared that they added pictograms on the labels to guide store associates when they replenished shelves and managed inventory. For instance, if a product needed an antitheft tag, if plants needed watering daily, etc.

Modeling and assumptions. For the composite organization, Forrester assumes:

- 10% of in-store products require replenishment weekly

Risks. Actual shelf replenishment time savings that organizations may realize with Pricer ESL could vary depending on:

- Staff efficiency and familiarity with stores
- Replenishment policies and frequencies

Results. To account for these variances, Forrester adjusted this benefit downward by 15%, yielding a five-year, risk-adjusted total PV of \$18.29 million.

“We added pictograms on labels to inform store associates how stock must be managed — products that need a security tag, that need regular watering, etc.”

Digital mobility and innovation manager, French grocery retailer

Total Time Savings On Shelf Replenishment							
Ref.	Metric	Source	Year 1	Year 2	Year 3	Year 4	Year 5
C1	Average number of products replenished per week	Interviews: 10% *A4	1,500	1,500	1,500	1,500	1,500
C2	Time spent by staff finding shelf position (minutes)	Interviews	3	3	3	3	3
C3	Time saved with guided replenishment	Interviews	35%	35%	35%	35%	35%
C4	Time savings per store on shelf replenishment per week (hours)	C1*C2*C3/60	26	26	26	26	26
C5	Total time savings on shelf replenishment (hours)	C4*A3*52	68,250	170,625	307,125	443,625	546,000
C6	Hourly wage of store associate	TEI standard	\$20	\$20	\$20	\$20	\$20
Ct	Total time savings on shelf replenishment	C5*C6	\$1,365,000	\$3,412,500	\$6,142,500	\$8,872,500	\$10,920,000
	Risk adjustment	↓15%					
Ctr	Total time savings on shelf replenishment (risk-adjusted)		\$1,160,250	\$2,900,625	\$5,221,125	\$7,541,625	\$9,282,000
Five-year total: \$26,105,625			Five-year present value: \$18,289,115				

ADDITIONAL BENEFITS

Additional benefits that customers experienced but were not quantified for this study include:

- **Pricing agility.** Manually updating paper price labels is a labor-intensive task that took up a lot of store associates' time at the interviewees' organizations. The ability to quickly adjust prices is crucial as retailers are faced with volatile inflation and currency fluctuations.

"If we did not make it easy to change prices, there would always be a mental barrier to updating prices."

Head of IT, Swedish grocery retailer

The digital mobility and innovation manager at a French grocery chain also shared that the automation enabled them to adjust clearance pricing on perishables more frequently which helped stores reduce daily inventory wastage.

Pricing agility enabled by ESLs will improve retailers' control over their margins, but this is dependent on organizations putting more time towards pricing analysis — whether centrally or at a store-level.

- **Elimination of pricing errors.** With paper labels, there was often a lag or even misalignment between shelf prices and prices maintained in the store's ERP system. This led to pricing errors at checkout. As prices on labels are now synced with prices in the stores' point-of-sales systems, switching to ESL eliminated pricing errors caused by technical issues (e.g., a lag in timing between price update at shelf vs. price update in the system) and human error.

The interviewee at a French grocery chain estimated that store managers saved up to 2 hours per week from not handling customer complaints related to pricing errors, freeing up their time for more value-adding work.

- **Enhanced shopping and brand experience.** Interviewees also shared that using ESLs gave

"It can take months for product packaging to be updated, so it is a key differentiator for us to have [nutrition] information on price labels. This is part of our core values to focus on health."

Business manager, Dutch grocery retailer

their store a modern image that is more in line with consumers' expectations. Pricer's ESLs can also display rich content about a product (e.g., country of origin, nutritional information, allergens, etc.) that provide shoppers with relevant information and enhance their shopping experience. The business manager at a Dutch grocery retailer shared that this helped support their organization's efforts to brand itself as a sustainable, socially responsible organization.

- **Reduced volatility from staff shortages and turnover.** Pricer ESL's guided picking and shelf replenishment use cases allowed retailers to quickly train and onboard new hires. As the Pricer system can guide associates to a product's location in stores, they do not have to spend time getting familiarized with store layouts.

FLEXIBILITY

The value of flexibility is unique to each customer. There are multiple scenarios in which a customer might implement Pricer and later realize additional uses and business opportunities. According to interviewees, some potential future use cases they are considering include:

- **Adopting more dynamic pricing strategies.** As they become more adept at adjusting prices to customer demand conditions, retailers can also begin to experiment more with different pricing strategies or by conduct A/B testing on their pricing tactics.

This would allow organizations to have more control over pricing and higher visibility on the impact of price changes.

- **Further enablement of other shelf-edge digital solutions.** Having the infrastructure and shelf hardware in place gives retailers further options to implement complementary shelf-edge solutions. For instance, the Head of IT at a Swedish grocery retailer chain shared that, in addition to ESLs, they were starting to experiment with Pricer ShelfVision cameras in one store to help them with planogram compliance and out-of-stock detection.

Some other partner solution integrations include price modeling and management, waste management and digital signage. These investments bring potential additional costs and benefits — largely in the form of further time savings and improved control over pricing and margins — that have not been quantified for this study.

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

“Our primary goal was to make price changes more automated and reliable, but we have subsequently added a lot more features — e.g., rich content for shoppers and staff, guided picking with the LED lights, etc.”

Digital mobility and innovation manager, French grocery retailer

Analysis Of Costs

■ Quantified cost data as applied to the composite

Total Costs									
Ref.	Cost	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Present Value
Dtr	Hardware and installation costs	\$4,565,000	\$6,847,500	\$9,130,000	\$9,130,000	\$6,847,500	\$0	\$36,520,000	\$29,871,893
Etr	Recurring license fees and ESL replacement costs	\$0	\$214,500	\$536,250	\$965,250	\$1,394,250	\$1,716,000	\$4,826,250	\$3,381,181
Ftr	Project management costs	\$0	\$274,575	\$360,675	\$446,775	\$446,775	\$360,675	\$1,889,475	\$1,412,465
	Total costs (risk-adjusted)	\$4,565,000	\$7,336,575	\$10,026,925	\$10,542,025	\$8,688,525	\$2,076,675	\$43,235,725	\$34,665,539

HARDWARE AND INSTALLATION COSTS

Evidence and data. The primary cost driver for an ESL implementation is the investment in hardware, including shelf labels, rail systems (for holding labels), and an in-store server at the start of deployment.

To get equipment up and running, two of the interviewees' organizations opted to engage a third-party installer to outfit a store overnight, while the third organization assigned the task to store associates, with the interviewee explaining that this was part of its change management strategy to get store associates familiar with the new system.

Pricer's ESLs have an expected battery lifespan of seven years and as such, no further significant hardware costs are expected in the first five years.

Modeling and assumptions. For the composite organization, hardware and installation costs total about \$83,000 per store.

Risks. The total hardware and installation costs an organization incur will vary according to the different types of ESL chosen (e.g., size, features), and where/how ESLs are deployed in a store.

Results. To account for these variances, Forrester adjusted this cost upward by 10%, yielding a five-year, risk-adjusted total PV (discounted at 10%) of \$29.87 million.

Hardware And Installation Costs								
Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3	Year 4	Year 5
D1	Hardware costs (per store)	Interviews	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000
D2	Labor costs for hardware installation (per store)	Interviews	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000
D3	Number of stores transitioning to electronic shelf labels	A3 (Current Year - Previous Year)	50	75	100	100	75	0
Dt	Installation and other upfront costs	(D1+D2)*D3	\$4,150,000	\$6,225,000	\$8,300,000	\$8,300,000	\$6,225,000	\$0
	Risk adjustment	↑10%						
Dtr	Installation and other upfront costs (risk-adjusted)		\$4,565,000	\$6,847,500	\$9,130,000	\$9,130,000	\$6,847,500	\$0
Five-year total: \$36,520,000				Five-year present value: \$29,871,893				

RECURRING LICENSE FEES AND ESL REPLACEMENT COSTS

Evidence and data. Interviewees mentioned that their organizations also incurred ongoing license and support fees for their use of Pricer. This included access to Pricer Plaza, a software-as-a-service (SaaS) platform from which store managers can control and monitor all aspects of their Pricer ESL system.

Modeling and assumptions. For this model, Forrester assumes a SaaS deployment of Pricer Plaza and also added a buffer of 1.5% for hardware replacement (in case of regular wear and tear).

Risks. The ongoing license costs for Pricer depend on size and number of stores an organization deploys the solution to, the features/use cases enabled, etc.

Results. To account for these variances, Forrester adjusted this cost upward by 10%, yielding a five-year, risk-adjusted total PV of \$3.38 million.

Recurring License Fees And ESL Replacement Costs								
Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3	Year 4	Year 5
E1	License and support costs per store	Pricer		\$2,700	\$2,700	\$2,700	\$2,700	\$2,700
E2	Hardware replacements (1.5% of original investment)	Pricer		\$1,200	\$1,200	\$1,200	\$1,200	\$1,200
E3	Number of stores digitalized with electronic shelf labels	A3		50	125	225	325	400
Et	Recurring costs	(E1+E2)*E3	\$0	\$195,000	\$487,500	\$877,500	\$1,267,500	\$1,560,000
	Risk adjustment	↑10%						
Etr	Recurring costs (risk-adjusted)		\$0	\$214,500	\$536,250	\$965,250	\$1,394,250	\$1,716,000
Five-year total: \$4,826,250				Five-year present value: \$3,381,181				

PROJECT MANAGEMENT COSTS

Evidence and data. Organizations also incurred internal project management costs during the deployment phase. The business manager at a Dutch grocery retail chain shared that they assigned one IT manager to oversee the roll out of ESLs to all stores. This project manager worked closely with store managers to transition each store onto the ESL platform.

Modeling and assumptions. Based on interview findings, Forrester estimates the following project management costs for the composite organization:

- One IT manager to oversee the entire project.
- Eighty hours spent by store managers in the implementation of ESL in their stores.

Risks. The time and resources organizations put into implementing an ESL solution across their retail stores depend on their current infrastructure and technology. For instance, retailers may take a longer time to integrate Pricer with older legacy systems and may need to upgrade other elements of their infrastructure, such as internet connections and connection points.

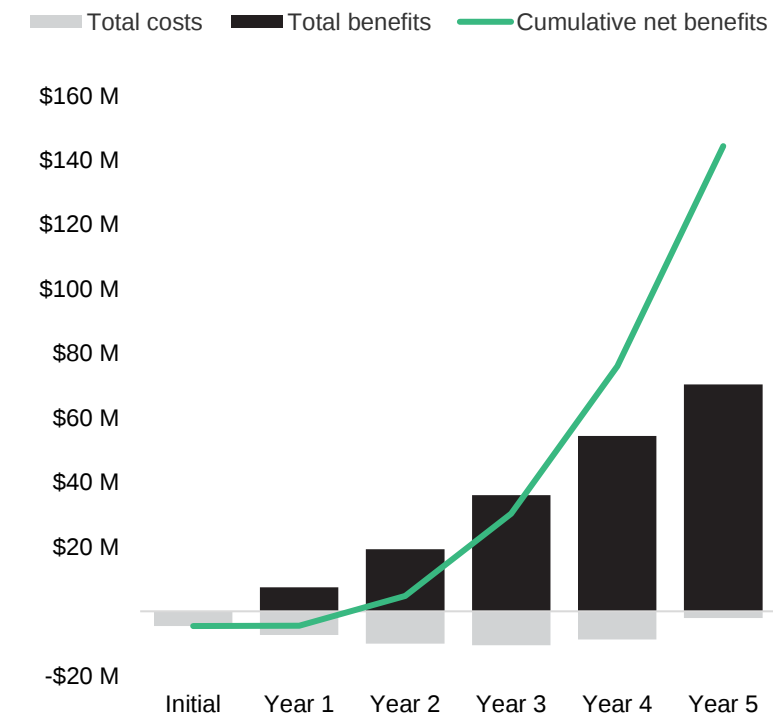
Results. To account for these risks, Forrester adjusted this cost upward by 5%, yielding a five-year, risk-adjusted total PV of \$1.41 million.

Project Management Costs								
Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3	Year 4	Year 5
F1	Number of project implementation managers	Interviews		1	1	1	1	1
F2	Fully loaded salary of IT project manager	TEI standard		\$97,500	\$97,500	\$97,500	\$97,500	\$97,500
F3	Time spent by store managers on implementing Pricer (hours)	Interviews		80	80	80	80	80
F4	Average salary of store manager (fully loaded, hourly)	TEI standard		\$41	\$41	\$41	\$41	\$41
F5	Number of stores transitioning to ESL	A3 (Current Year - Previous Year)		50	75	100	100	75
F6	In-store resources spent on project management	F3*F4*F5		\$164,000	\$246,000	\$328,000	\$328,000	\$246,000
Ft	Project management costs	F2+F6	\$0	\$261,500	\$343,500	\$425,500	\$425,500	\$343,500
	Risk adjustment	↑5%						
Ftr	Project management costs (risk-adjusted)		\$0	\$274,575	\$360,675	\$446,775	\$446,775	\$360,675
Five-year total: \$1,889,475				Five-year present value: \$1,412,465				

Financial Summary

CONSOLIDATED FIVE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)



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

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

Cash Flow Analysis (Risk-Adjusted Estimates)

	Initial	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Present Value
Total costs	(\$4,565,000)	(\$7,336,575)	(\$10,026,925)	(\$10,542,025)	(\$8,688,525)	(\$2,076,675)	(\$43,235,725)	(\$34,665,539)
Total benefits	\$0	\$7,421,917	\$19,245,417	\$36,071,344	\$54,477,766	\$70,410,692	\$187,627,135	\$130,681,982
Net benefits	(\$4,565,000)	\$85,342	\$9,218,492	\$25,529,319	\$45,789,241	\$68,334,017	\$144,391,410	\$96,016,443
ROI								277%
Payback period								18 months

Appendix A: Total Economic Impact

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

TOTAL ECONOMIC IMPACT APPROACH

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

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

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

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

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



PRESENT VALUE (PV)

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



NET PRESENT VALUE (NPV)

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



RETURN ON INVESTMENT (ROI)

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



DISCOUNT RATE

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



PAYBACK PERIOD

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

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