

A Forrester Total Economic
Impact™ Study
Commissioned By
K2

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The Total Economic Impact™ Of K2 **blackpearl**

Cost Savings And Business Benefits
Enabled By The blackpearl Business
Application Platform

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Executive Summary

K2 commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study to examine the potential return on investment (ROI) enterprises may realize by deploying K2 blackpearl. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of the K2 blackpearl business application platform within their organizations.

To better understand the benefits, costs, and risks associated with a K2 blackpearl implementation, Forrester interviewed several existing customers with multiple years of experience building and managing business process management (BPM) applications using the blackpearl platform.

With K2's business process application platform, organizations can use visual designers to rapidly build and deploy low code applications that are agile, scalable and reusable, resulting in modern processes that quickly and easily connect people, data, decisions and systems. K2 delivers information to the right people at the right time, empowering them to accelerate their work and become more efficient online, offline and from any device. For more details on K2 blackpearl, see the section titled: K2 blackpearl: Overview.

Prior to implementing the K2 business application platform, interviewed customers were using a variety of inefficient systems to manage their critical business workflows, ranging from highly manual, paper-based processes to siloed, complicated custom-coded solutions. Using the K2 blackpearl platform, organizations were able to reduce cost and complexity by consolidating disparate, redundant, and highly customized business processes solutions onto an enterprise-wide business application platform accessible from any device. Most importantly, however, the blackpearl platform empowered the functional business unit leaders at these organizations to accelerate, build, and manage more of their critical business workflow applications using K2's low-code, drag-and-drop functionality. The result is that the IT and DevOps resource requirements to build, deploy, and maintain the organization's business applications were drastically reduced, and end user efficiencies were gained across the enterprise.

K2 BLACKPEARL LOWERS BUSINESS APPLICATION DEVELOPMENT COSTS, IMPROVES TIME-TO-VALUE, AND INCREASES BUSINESS PROCESS EFFICIENCY

Our interviews with three existing customers and subsequent financial analysis found that a composite organization based on these interviewed organizations experienced the risk-adjusted ROI, benefits, and costs shown in Figure 1.¹

FIGURE 1
Financial Summary Showing Three-Year Risk-Adjusted Results

ROI: 466%	Payback: 9.2 months	Total benefits (PV): \$6.10M	Total costs (PV): \$1.08M	Reduced application development time by: 78%
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Source: Forrester Research, Inc.

K2's blackpearl platform helps organizations rapidly build and consolidate automated business workflows, using low-code, drag-and-drop design functionality on a single pane of glass.

Over a three-year period, a composite organization with multiple business workflows can expect to:

- **Reduce business process application development costs by \$1.1M.**
- **Lower labor costs by \$787,051 through use of junior-level and business users in lieu of senior-level developers.**
- **Increase business application management efficiencies by \$752,541.**
- **Realize business productivity gains of \$3.4 million from added process efficiencies and faster time-to-deploy.**

➤ **Benefits.** The composite organization experienced \$6.10 million in risk- and present value-adjusted quantified benefits, comprising the following benefit categories:

- **Reduction in business process application development costs of \$1.11M due to a drastic reduction in effort.** By using K2's low-code, drag-and-drop visual designers for building applications with its simplified and streamlined data integration functionalities, the composite organization was able to reduce the time required to build a business process application by 78%.
- **Labor cost reduction of \$787,051 through the use of junior-level and nondeveloper business professionals in lieu of senior-level developers.** By moving away from custom-coded .NET or C# business applications that require expensive and difficult-to-hire senior-level developer talent, the composite organization was able to lower its labor and training costs by using junior-level and nondeveloper business analyst resources who could more easily learn the drag-and-drop visual designers for creating application on the blackpearl platform. The benefit for the organization is that it was able to rebalance resources and place senior-level developers on other value-add business initiatives.
- **Business process application management efficiency gains of \$752,541.** Using K2 blackpearl as its enterprise business process application standard, the organization consolidated and centralized its business processes onto a single, holistic tool, improving its efficiency in supporting, managing, optimizing, and troubleshooting its business process-oriented applications.
- **Quicker realization of business productivity gains of \$3.44 million from added process efficiencies.** With the low-code, drag-and-drop interfaces that support rapid development and deployment and automation, the organization was able to digitally transform its business processes and improve 50% of its business process workflows, resulting in a 1.5% improvement in end user productivity on an annual basis, providing the organization with over \$3.4 million in process efficiencies.

➤ The composite organization identified the following additional benefits of using K2 blackpearl but was not able to quantify the benefits at the present time:

- **Ability to provide a better user and customer experience (CX) by digitally transforming its business process applications.** By digitally transforming and automating its internally and externally facing business process workflows, the composite organization was able to deliver a better experience to both its employees and customers. The exact dollar-defined value of this benefit has not been calculated at this time, but existing Forrester research has indicated a definitive positive correlation between the organizational bottom line and Customer Experience Index (CX Index™) scores.²
- **Enhanced ability to mobilize its workforce through the development of business applications that work anywhere and on any device.** By enabling the organization to build business applications that could run both on-premises and in the cloud and work across endpoint devices, K2 blackpearl was able to improve operational efficiencies and employee productivity levels, while supporting the organization's bring-your-own-device (BYOD) policies.

As the interviewed organizations were not able to explicitly identify metrics that would lead to our quantification of these benefits at the present time, these business benefits have not been included in the ROI calculation for this study. Regardless, these are benefits that potential adopters of the solution may very well experience.

To provide further clarity on the financial impact of end user process efficiencies, we have modeled a scenario absent of those results, separating hard and immediately tangible results experienced by the IT and DevOps team versus those results experienced by the composite organization's end users.

FIGURE 2
Hard Benefits Versus Total Benefits Breakout



Source: Forrester Research, Inc.

➤ **Costs.** The composite organization experienced \$1.08 million in risk- and present value-adjusted costs, comprising the following cost categories:

- **K2 licensing and support costs of \$585,454.** These are one-time fees paid to K2 for perpetual production server licenses, test/nonproduction server licenses, and user licenses, along with annual fees for software support and maintenance.
- **Training, ramp-up, and business success program costs of \$252,753.** These are one-time costs required to train and familiarize application builders, be they more junior-level developers or business-level operators, with the K2 blackpearl platform. Additionally, this cost category includes upfront professional services costs incurred by the composite organization to assist in building brokers, SmartObjects and its first several business applications and ongoing costs associated with K2's customer success and assistance program.
- **Process migration and K2 deployment costs of \$237,881.** These are initial and ongoing costs to deploy, upgrade, and host the K2 platform over the three-year forecast period. In addition, this cost category includes one-time costs associated with reassessing, migrating and rebuilding existing business process applications for the K2 platform.

Disclosures

The reader should be aware of the following:

- The study is commissioned by K2 and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.
- Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the report to determine the appropriateness of an investment in K2's blackpearl platform.
- K2 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.
- K2 provided the customer names for the interviews but did not participate in the interviews.

Analysis

INTERVIEWED ORGANIZATIONS

Forrester interviewed the following three K2 blackpearl customers for this case study:

- › **A commercial real estate arm of an American financial services institution with 3,200 employees who process approximately \$50 billion in wholesale commercial real estate loans annually.** Due to the number of checks and balances and approvals required in the commercial loan underwriting process, the company needed a way to streamline its workflows, while ensuring the process was flexible enough to handle the nuances and due diligence complexity among various real estate transactions. In addition, the organization's legacy, paper-based loan underwriting workflow prohibited it from maintaining digital repositories of loan approval documents, making it difficult to keep track of approvals.
- › **An Asia Pacific regional airline carrier with over 3,500 employees and revenues of over \$1.2 billion annually.** With 34 departments and highly complex workflow requirements, the organization needed to build a central repository for all of its business workflows, while empowering each of the department heads to manage and maintain their own business processes.

“Being able to develop and automate our processes more quickly, it has brought to light the inefficiencies of our older manual process as we moved to these new digital ones. K2 has been really important to us in terms of delivering automated processes for new business initiatives and the modernization of old workflows.”

~ Information system lead, regional airline

“We had no enterprise business process management standard before implementing K2 blackpearl. Our workflows were spread across a number of enterprise systems, requiring a lot of customization to create a holistic application that pulled data from multiple systems.”

~ Solution architect, global CPG company

Forrester interviewed the following three K2 blackpearl customers for this case study:

- › A global consumer packaged goods (CPG) company with over 43,000 employees spanning 150 countries and annual revenue in excess of \$20 billion. This organization formerly leveraged a set of highly customized, disparate point solutions for business workflow management, and lacked an enterprise-wide business process management standard. With a complex manufacturing footprint spanning 36 countries, and an even more complex business footprint spanning 150 countries, the organization needed a workflow solution that reduced costs, empowered business leaders to take ownership of their business processes, and eliminated IT from business process management.

THE COMPOSITE ORGANIZATION

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas financially affected. The composite organization that Forrester synthesized from these results represents an organization with the following characteristics:

- › A US-based consumer goods company with 5,000

employees globally, spanning North American, EMEA, and APAC.

- › Annual revenues exceeding \$2 billion.
- › Manufacturing facilities located in four countries, building 60 distinct product lines that are supported by eight product-oriented business units.
- › Marketing and sales functions that are distributed to each of the organization's product-focused business units.
- › A shared services organization with five horizontal business units, including human resources, finance, information technology, manufacturing, and research and development.
- › Two data centers, with one located in North America and the other in APAC, serving virtual machine capability globally.

INTERVIEW HIGHLIGHTS

Business process automation and management is becoming a critical enabling technology in helping users who are embarking on digital transformation within their organization. This approach is helping organizations meet their business goals of increasing operational efficiency, delivering essential business applications more quickly, and ensuring business outcomes regardless of IT backlog and developer resource constraints, which, in turn, is helping them win, serve, and retain customers more effectively. By building business applications on K2's low-code, drag-and-drop platform, businesses are able to rapidly develop and deploy business applications that improve business productivity and compliance and deliver a better customer experience.

At one interviewed organization, K2 reduced the development time required to build automated business process workflow applications by 80%, enabling the company to retire approximately 75 legacy business applications and roll out approximately eight to ten modernized and digitalized business process applications each month on the K2 blackpearl platform. In addition to reducing application development time, interviewed organizations indicated that they invested in blackpearl to:

- › Modernize, automate, and digitally transform their business processes to improve operational efficiencies, enforce due diligence throughout the workflow, and deliver a better customer experience.
- › Consolidate disparate business workflows onto an enterprise business process automation and management standard to reduce cost and complexity.
- › Empower business unit owners to take ownership of their business process applications through enhanced visibility and control, allowing them to be more agile and self-sufficient in meeting their business needs.

The interviews revealed that:

- › **K2 blackpearl enables organizations to rapidly transform their business processes and improve compliance.** By digitally transforming and automating their manual and semi-manual business workflows, interviewed organizations accrued significant employee productivity gains and were able to deliver a better customer experience. In addition, modernization and automation of workflows improved the interviewees' ability to strictly monitor alignment with institutional due diligence and compliance standards.

“Some of our larger process application development efforts were taking six to eight months to develop using the .NET framework. We are able produce some of these applications in two to three months now in the drag-and-drop K2 environment, and even quicker for simpler projects”

~ Solution architect, global CPG company

- › **Organizations need an enterprise business process automation and management standard for their critical business workflows.** Interviewed organizations indicated that they adopted K2 blackpearl to institute an enterprisewide business process automation and management standard within their organization in order to reduce enterprise workflow solution cost and complexity. Interviewees were seeking to retire and consolidate as many disparate, redundant, and highly customized business process solutions as possible onto a holistic, enterprisewide business process automation and management solution with a single entry point.
- › **K2 blackpearl empowers business unit leaders to take ownership of their critical business processes.** With the K2 blackpearl platform, interviewed organizations were able to reduce business unit dependency on IT for the development and management of business process applications. K2's solution empowered business unit owners to build and manage their business workflow applications, using intuitive, low-code development tools, while improving their visibility and control over the critical business workflow processes within their environment. As a result, business unit leaders were able to reduce costs, improve efficiency, expedite time-to-value, and deliver an improved experience to their customers.

“Our organization’s biggest concern was flexibility, because every real estate deal is so unique. With K2, we can make any number of permutations through the approval workflow process. In that way, our app is almost like an elaborate case management system.”

~ Technology manager, financial services institution

BENEFITS

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

- Reduction in business process application development costs.
- Labor cost reduction through the use of junior-level and nondevelopers business professionals in lieu of senior-level developers.
- Business process application management efficiency gains.
- Quicker realization of business productivity gains from added process efficiencies.

In addition, the composite organization experienced the following two *nonquantified* benefits in this case study:

- Ability to provide a better user and customer experience by digitally transforming its business process applications.
- Enhanced ability to mobilize its workforce through the development of business applications that work anywhere and on any device.

BENEFITS: QUANTIFIED



Reduction In Business Process Application Developments Costs

The composite organization indicated that a key benefit of the blackpearl platform was the ability to empower business unit owners to develop and implement automated business applications by leveraging low-code, drag-and-drop functionality and simplified and streamlined data integration using SmartObjects. Prior to consolidating the organization's business process applications on the blackpearl platform, the composite organization's IT group expended significant .NET resources to hard code business applications and build custom data connections between the organization's enterprise systems and business applications.

Given the organization's complex, global organizational structure, IT managed and maintained myriad redundant custom point solutions for each business unit. This required significant customization and IT resources to connect each business workflow application to multiple enterprise systems and inhibited business process digitization and modernization efforts.

Following the implementation of the blackpearl business application platform, the composite organization reduced the development time required to build and deploy each business process application by 78%. Since the composite organization built and deployed 40 business process applications in Year 1, 100 business process applications in Year 2, and 60 business process applications in Year 3, it was able to reduce its senior business application developer resource requirements by approximately 3,600 hours in Year 1, 9,000 hours in Year 2, and 5,400 in Year 3. At an average

"K2 has added significant out-of-the-box data integration functionality over the years. We had custom written many things previously and gotten rid of that code to use K2's out-of-the-box functionality over time."

~ Solutions architect, global CPG company

hourly wage of \$75 for a senior developer, the organization was able to reduce its business application development costs by \$1,357,200 over the three-year forecast period.

TABLE 1
Reduction In Business Process Application Development Costs

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
A1	New number of processes / apps developed		40	100	60
A2	Average development hours spent per app prior to K2, exclusive from criteria building and assessments	Interviews	116	116	116
A3	Percent of development hours saved per app with K2, from drag and drop development and SmartObjects	Interviews	78%	78%	78%
A4	Developer hours saved per app with K2		90	90	90
A5	Hourly cost of senior developers		\$75	\$75	\$75
At	Reduction in business process application development costs	A1*A2*A3*A5	\$271,440	\$678,600	\$407,160

Source: Forrester Research, Inc.



Labor Cost Reduction Through The Use Of Junior-Level And Nondeveloper Business Professionals In Lieu Of Senior-Level Developers

In addition to the reduction in the number of developer hours required to build and deploy a business process application, the composite organization benefited from a reduction in labor costs associated with using junior-level and nondeveloper business analysts in lieu of senior-level developers.

Prior to adopting the blackpearl platform, the composite organization required a team of senior-level developers proficient in .NET, SharePoint, and business process management to build business process applications. Highly skilled developer resources were needed to build the custom code required to integrate the organization's custom business applications with other enterprise systems.

Following the implementation of the blackpearl platform, the composite organization was able to substitute 25% of its highly skilled, senior-level business application development team with junior-level and nondevelopers such as business analysts, in Year 1, due to the low-code, visual nature of building business process applications on the blackpearl platform. As the composite organization scaled its use of the blackpearl platform in years 2 and 3, it was able to substitute 50% of its senior-level business application development team with junior-level and nondevelopers, reallocating its top application development talent to other value-building business initiatives within the organization. In addition, by using junior-level and nondevelopers within a low-code development environment, the company was able to decrease the number of training hours for new developers by 80 in Year 1 and 40 in years 2 and 3.

As a result of using the blackpearl platform, the composite organization was able to reallocate three senior-level developers in Year 1, eight senior-level developers in Year 2, and 10 senior-level developers in Year 3, substituting less-costly junior-level developers and line-of-business (LOB)-level nondeveloper professionals for

the production of business process applications across the organization. As a result, the company was able to reduce developer labor and training costs by \$1,032,000 before adjusting for risk over the three-year forecast period.

The average salary of junior- and senior-level developer talent and business analysts will vary by region, skillset, exact position, and tenure with the company. To compensate, this benefit was risk-adjusted and reduced by 5% in Table 2. See the section on Risks for more detail.

TABLE 2

Labor Cost Reduction Through The Use Of Junior-Level And Nondeveloper Business Professionals In Lieu Of Senior-Level Developers

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
B1	Total number of process application developers/non-IT designers		12	16	20
B2	Percentage allocation to junior developers/non-IT designers and from senior developers		25%	50%	50%
B3	Decrease in training time, in hours, for new developer/LOB designer		80	40	40
B4	Hourly cost of senior developers		\$75	\$75	\$75
B5	Hourly cost of junior developers/LOB non-IT designers		\$50	\$50	\$50
Bt	Labor cost reduction though the use of junior-level and nondevelopers in lieu of senior developers	$((B1*B2*1,920)+(B1*B2*B3))*(B4-B5)$	\$150,000	\$392,000	\$490,000
	Risk adjustment	↓5%			
Btr	Labor cost reduction though the use of junior-level and nondevelopers in lieu of senior developers (risk-adjusted)		\$142,500	\$372,400	\$465,500

Source: Forrester Research, Inc.

Business Process Application Management Efficiency Gains

The features and functionality of K2 blackpearl enabled the composite organization to increase the efficiency of supporting and managing its business process-oriented applications. Before adopting and deploying K2 blackpearl, monitoring workflows for errors was a highly manual process, requiring IT resources to track and log individual workflow errors encountered across the company's workflows on an individual basis. Once workflow errors were identified, debugging often required recoding and redeployment of the business application. Given large IT backlogs and constrained IT resources, the organization often had long response times for troubleshooting and implementing corrections.

After implementing the blackpearl platform, the composite organization automated the process of tracking, monitoring, and trending business process errors, and expedited the process of debugging problematic workflow applications. As a result, the composite organization reduced the hours required to monitor each of its business

process-oriented applications by 24 hours annually, while also reducing the hours required to debug each of its business process-oriented applications by 6 hours annually.

Since the composite organization had grown the number of business process applications deployed within its environment from 60 in Year 1 to 220 in Year 3, at an average hourly rate of \$75 for senior developers, the organization was able to accrue a total of \$990,000 in business process application management efficiency gains over the three-year forecast period, before adjusting for risk.

The composite organization and Forrester recognize that when you provide staff with time-saving tools, not all the saved time translates into increased productivity. Therefore, Forrester risk-adjusted this benefit by 5%, as seen in Table 3.

TABLE 3
Business Process Application Management Efficiency Gains

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
C1	Monitoring gains, in hours per application annually		24	24	24
C2	Debugging gains, in hours per application annually		6	6	6
C3	Number of process oriented apps deployed		60	160	220
C4	Hourly cost of senior developers		\$75	\$75	\$75
Ct	Business process application management efficiency gains	(C1+C2)*C3*C4	\$135,000	\$360,000	\$495,000
	Risk adjustment	↓5%			
Ctr	Business process application management efficiency gains (risk-adjusted)		\$128,250	\$342,000	\$470,250

Source: Forrester Research, Inc.



Quicker Realization Of Business Productivity Gains From Added Process Efficiencies

Prior to implementing K2 blackpearl as its enterprise business process application standard, the composite organization managed a number of manual and semi-manual business processes and siloed, highly customized business process applications, requiring significant IT resources for both initial development and deployment and ongoing maintenance and management. As such, the composite organization was only able to produce 12 business process-oriented applications in a given year, inhibiting its efforts to modernize and automate its business processes. This inhibited the organization's ability to improve business process user productivity and, in some instances, hurt the experiences of both its employees and customers. In addition, some new processes required changing, due to

"At any one given time, our organization is building eight to 10 apps a month on blackpearl, with a running completed total of roughly 600 apps currently."

~ Solution architect, global CPG company

the rapid pace of changing business strategies. However, business agility from the tactical levels was nearly nonpresent with the immovable older business processes.

Following the deployment of K2 blackpearl, the organization was able to increase the production of business process applications by 28 in Year 1, 88 in Year 2, and 48 in Year 3, leveraging K2's reusable business applications and reusable SmartObjects tools. As a result, the composite organization was able to improve the efficiency and effectiveness of the organization's business processes by digitally transforming and modernizing its business workflows, positively impacting 50% of the organization's business processes by year 3. Using these fully digitalized and automated business process applications, each end user was able to increase their efficiency and productivity by 1.5% per year. At an average fully loaded per-employee salary of \$84,000 per year, the composite organization was able to accrue \$5,481,000 in incremental business productivity gains, before risk and present value adjusting the benefit.

Interviewed organizations exemplified a wide range of business process automation and management maturity levels, resulting in a range of business productivity gains. For this reason, this benefit was risk-adjusted (reduced) by 20% in Table 4.

TABLE 4
Quicker Realization Of Business Productivity Gains From Added Process Efficiencies

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
D1	Total number of process application users		1,000	5,000	5,000
D2	Number of process oriented apps produced in a year, existing state		12	12	12
D3	Number of process oriented apps produced in a year, with K2		40	100	60
D4	Increase in business process app output with K2	D3-D2	28	88	48
D5	Cost of average FTE at organization, fully loaded		\$84,000	\$84,000	\$84,000
D6	Percentage of business affected by K2 built processes		10%	35%	50%
D7	Percentage increase in efficiency from modernized process applications, per person		1.5%	1.5%	1.5%
Dt	Time-to-value gains in business productivity from added process efficiencies	D1*D5*D6*D7	\$126,000	\$2,205,000	\$3,150,000
	Risk adjustment	↓20%			
Dtr	Time-to-value gains in business productivity from added process efficiencies (risk-adjusted)		\$100,800	\$1,764,000	\$2,520,000

Source: Forrester Research, Inc.

Total Benefits

Table 5 shows the total of all benefits across the four areas listed above, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total benefits to be a PV of \$6,095,889.

TABLE 5
Total Benefits (Risk-Adjusted)

Ref.	Benefit Category	Year 1	Year 2	Year 3	Total	Present Value
Atr	Reduction in business process application development costs	\$271,440	\$678,600	\$407,160	\$1,357,200	\$1,113,495
Btr	Labor cost reduction through the use of junior-level and non-developers in lieu of senior developers	\$142,500	\$372,400	\$465,500	\$980,400	\$787,051
Ctr	Business process application management efficiency gains	\$128,250	\$342,000	\$470,250	\$940,500	\$752,541
Dtr	Time-to-value gains in business productivity from added process efficiencies	\$100,800	\$1,764,000	\$2,520,000	\$4,384,800	\$3,442,801
Total benefits (risk-adjusted)		\$642,990	\$3,157,000	\$3,862,910	\$7,662,900	\$6,095,889

Source: Forrester Research, Inc.

BENEFITS: UNQUANTIFIED

In addition to the quantified benefits of the K2 platform described above, the composite organization identified the ability to provide a better user and customer experience and mobilize its workforce through the development of business applications that work anywhere and on any device as key benefits of the K2 blackpearl platform. As the interviewed organizations were not able to explicitly offer quantifying metrics at the present time, this business benefit has not been included in the ROI calculation for this study. Regardless, this is a benefit that potential adopters of the solution may very well experience.



Ability To Provide A Better User And Customer Experience By Digitally Transforming Business Process Applications

Prior to deploying K2 as their enterprise business process application standard, individuals working with business process requests continually struggled to keep track of the myriad documents and approvals stemming from their manual, paper-based business processes. In some cases, workflow errors and failures caused users to experience significant delays related to their business requests, inhibiting productivity and frustrating employees. Unfortunately, customers were not insulated from the calamity created by inefficient and error-prone internal business process workflows. Issues in shipping and logistics business process workflows created delays in store shipments, risking business relationships with both channel partners and customers. As such, the composite organization adopted K2 as part of a broader digital transformation strategy to offer a better user and customer experience. By digitally transforming and automating its legacy business process workflows, the composite organization was able to deliver a better experience to its employees and customers.



Enhanced Ability To Mobilize Its Workforce Through The Development Of Business Applications That Work Anywhere And On Any Device

Bring-your-own-device (BYOD) policies and the increasingly mobile nature of the workforce require organizations to build business applications that run both on-premises and in the cloud and work across endpoint devices. Prior to deploying K2, manual processes and paper documentation brought critical business process workflows to a standstill when users were sick, traveling, or on vacation. Worse yet, lack of business process visibility and functionality for mobile workers backlogged workflows, causing significant delays.

In order to improve operational efficiencies and employee productivity levels, and to meet the changing needs of its growing mobile workforce, the composite organization leveraged K2 to build a seamless mobile experience to allow business process users to remain productive on the go.

COSTS

The composite organization experienced a number of costs associated with the blackpearl business application platform:

- K2 licensing and support costs.
- Training, ramp-up, and business success program costs.
- Process migration and K2 deployment costs.



K2 Licensing And Support Costs

Upfront software licensing fees incurred by the composite organization for K2 blackpearl include a perpetual server license, two test/nonproduction server licenses, and 1,000 perpetual user licenses. As the composite organization scaled its use of the blackpearl platform across additional functional business units and additional business processes in Year 2, it purchased an additional perpetual server license and 4,000 incremental perpetual user licenses. In addition, the composite organization paid annual software support and maintenance fees on all of its perpetual software licenses, amounting to \$30,375 in Year 1 and \$101,250 in years 2 and 3.

Over the three-year forecast period, the composite organization spent a total of \$682,875 on K2 blackpearl software licensing and annual support services.

TABLE 6
K2 Licensing And Support Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
E1	Production/test/QA server licenses and user license costs		\$135,000		\$315,000	
E2	Support and maintenance plans		\$30,375	\$0	\$101,250	\$101,250
Et	K2 licensing and support costs	E1+E2	\$165,375	\$0	\$416,250	\$101,250

Source: Forrester Research, Inc.



Training, Ramp-Up, And Business Success Program Costs

During the initial deployment of the K2 blackpearl platform, the composite organization needed to train and onboard 12 existing application developers to learn how to build business process and workflow applications on the blackpearl platform. In order to accomplish this, the organization put each business process application builder through 8 hours of training. In addition, each business application builder, which became inclusive of both developers and business user application builders, took 80 hours to fully ramp up and gain mastery over the K2 blackpearl platform. At an average fully loaded hourly cost per application builder of \$68.75 initially for a cohort of strictly developers and \$62.50 in years 2 and 3 for a combination of business user application builders and developers, the composite organization spent \$72,600 on training upfront, and an additional \$22,000 in years 2 and 3. Calculations are inclusive of four incrementally added business application builders at the senior developer and business analyst levels in years 2 and 3.

In addition, the organization engaged K2 professional services in Year 1 to help build reusable brokers and SmartObjects and assist in the development of the organization's first several business process applications at an expense of \$100,000. In years 2 and 3, the composite organization purchased 100 credit points annually, in

order to gain additional access to K2's customer success program, ensuring that additional assistance to build complex apps was there when necessary.

Forrester risk-adjusted the training, ramp-up, and business success program costs upward by 10% to reflect variance in senior-level developer, junior-level developer, and non-developer business analyst salaries and variations in the amount of time required to ramp-up on the platform.

TABLE 7
Training, Ramp-Up, And Business Success Program Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
F1	Training hours per developer / business application builder		8		8	8
F2	Ramp up hours per process developer		80		80	80
F3	Process developers / business application builders added to development team	Note: Accounts for attrition	12		4	4
F4	Average hourly cost of business application builders		\$68.75	\$62.50	\$62.50	\$62.50
F5	K2 Professional Services to assist in building brokers, SmartObjects and initial business applications			\$100,000		
F6	Credit points for ongoing K2 customer success program and assistance	100 credits per year 2 and 3			\$20,000	\$20,000
Ft	Training, ramp-up, and business success program costs	((F1+F2)*F3*F4)+(F5+F6)	\$72,600	\$100,000	\$42,000	\$42,000
	Risk adjustment	↑10%				
Ftr	Training, ramp-up, and business success program costs (risk-adjusted)		\$79,860	\$110,000	\$46,200	\$46,200

Source: Forrester Research, Inc.



Process Migration and K2 Deployment Costs

Prior to implementing K2 blackpearl, the composite organization engaged the K2 team for one week to review the current state of its business process workflow environment and determine the scope, sequence, and timeline for digitally transforming and modernizing its business processes using the K2 platform. Following the initiation of this engagement, the company spent significant upfront time and effort reassessing, modernizing, and migrating existing business applications to the K2 platform. The organization spent 80 hours to reassess and fully migrate each of its 20 legacy business process applications to the K2 platform, costing the organization a total of \$110,000 in upfront business workflow application migration costs.

Initial installation and deployment of the K2 platform required 640 hours of internal IT resource involvement, while subsequent annual major platform upgrades in years 2 and 3 required an additional 640 hours of internal IT

resources. Furthermore, in order to deploy the blackpearl platform on-premises, the composite organization installed blackpearl on a single server upfront. It acquired an additional server in Year 2, as it expanded the number of individuals building and using business process applications on the K2 platform. Each of these servers required \$1,800 for annual infrastructure support and maintenance.

Forrester risk-adjusted the process migration and deployment costs associated with the blackpearl platform upward by 5% to account for salary variations, the amount of time required to migrate legacy business process applications onto the K2 blackpearl platform, and the amount of time spent working on the solution's implementation and ongoing management.

TABLE 8
Process Migration And K2 Deployment Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
G1	Hardware resource costs		\$9,000		\$9,000	
G2	Infrastructure support and maintenance resource costs			\$1,800	\$3,600	\$3,600
G3	Initial internal recode POC, test on non-production environment, and deployment resource hours		640			
G4	Subsequent internal annual major upgrade deployment time, in hours				640	640
G5	Cost per hour of IT resource for deployment		\$56.25	\$56.25	\$56.25	\$56.25
G6	K2 discovery engagement to define scope of deployment		\$18,000			
G7	Average hourly cost of business application builders		\$68.75	\$62.50	\$62.50	\$62.50
G8	Existing processes / apps to be migrated and rebuilt		20			
G9	Average hours necessary for reassessment and migration, per process / app		80			
Gt	Process migration and K2 deployment costs	$(G1+G2)+(G3*G5)+((G4*G5)+(G7*G8*G9))$	\$155,000	\$1,800	\$48,600	\$39,600
	Risk adjustment	↑5%				
Gtr	Process migration and K2 deployment costs (risk-adjusted)		\$162,750	\$1,890	\$51,030	\$41,580

Source: Forrester Research, Inc.

Total Costs

Table 9 shows the total of all costs as well as associated present values (PVs), discounted at 10%. Over three years, the composite organization expects total costs to be a PV of approximately \$1.08 million.

TABLE 9
Total Costs (Risk-Adjusted)

Ref.	Cost Category	Initial	Year 1	Year 2	Year 3	Total	Present Value
Etr	K2 licensing and support costs	(\$165,375)	\$0	(\$416,250)	(\$101,250)	(\$682,875)	(\$585,454)
Ftr	Training, ramp-up, and business success program costs	(\$79,860)	(\$110,000)	(\$46,200)	(\$46,200)	(\$282,260)	(\$252,753)
Gtr	Process migration and K2 deployment costs	(\$162,750)	(\$1,890)	(\$51,030)	(\$41,580)	(\$257,250)	(\$237,881)
	Total costs (risk-adjusted)	(\$407,985)	(\$111,890)	(\$513,480)	(\$189,030)	(\$1,222,385)	(\$1,076,088)

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 blackpearl 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 composite organization’s growth strategy is contingent on the company’s ability to automate, digitalize, and optimize all of its business processes, so it can invest its effort and capital into initiatives that help win, serve, and retain clients. As such, the organization will continue to look for incremental manual and semi-manual workflows to automate and digitalize on the K2 blackpearl platform. Additionally, the company will continue to reassess, modernize, and migrate siloed legacy business process solutions onto the K2 blackpearl platform, lowering the cost and risk associated with highly complex customized business processes.

The complexities of providing for cross-business-unit applications often involve addressing data originating from multiple repositories and infrastructure stacks. K2 is built from the ground up to offer SmartObjects for simplified and streamlined data integration for many popular solutions, such as Salesforce, SAP, Dynamics, and many others, that span across entire organizations; if a more programmatic approach to integration is required, K2 also provides a REST broker. The composite organization is able to scale easier with the reusable SmartObjects modules, which enables the proliferation of more efficient applications, forms, and workflows to nearly all roles within the organization.

FLEXIBILITY IN CHOICE OF DEPLOYMENT MODEL

Like many organizations trying to reduce their physical IT footprint, the composite organization is making a shift to deploy business process automation in the cloud as part of its digital transformation strategy to augment its IT delivery. With this migration, many of its data services will also be moved. As with all migrations, there are elements of risk, especially in the breakage of linkages with custom applications. The upcoming K2 Cloud Platform offering can largely mitigate these issues with SmartObjects and familiar integration that will carry over. New deployment costs are expected to be minimal, as this is a fully managed cloud software-as-a-service (SaaS) solution provided and managed by K2. With the composite organization’s transition to the K2 Cloud Platform, it can expect to see incremental benefits such as lower annual maintenance, administration, and hardware resources expenses, along with the ability to rapidly scale its business process application environment.

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 blackpearl 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 blackpearl, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for cost and benefit estimates.

TABLE 10
Benefit And Cost Risk Adjustments

Benefits	Adjustment
Labor cost reduction through the use of junior-level and nondeveloper business professionals in lieu of senior-level developers	↓ 5%
Business process application management efficiency gains	↓ 5%
Quicker realization of business productivity gains from added process efficiencies	↓ 20%
Costs	Adjustment
Training, ramp-up, and business success program costs	↑ 10%
Process migration and K2 deployment costs	↑ 5%

Source: Forrester Research, Inc.

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:

- The degree to which organizations realize business productivity improvements is contingent on the current level of digitalization and business process modernization and automation in each organization’s business environment.
- The degree to which productivity savings translate to business benefits depends on how much saved time workers apply to other value-add business activities.

The following implementation risks that affect costs are:

- Training, ramp-up, and business success program expenses will vary depending on senior-level developer, junior-level developer, and nondeveloper business analyst salaries and the skill sets of your existing internal resources.
- Process migration and deployment costs will vary with the actual number, position, and tenure of people working on the project, the amount of time spent during initial deployment and subsequent major upgrades and the number and state of legacy business process applications being moved onto the K2 blackpearl platform.

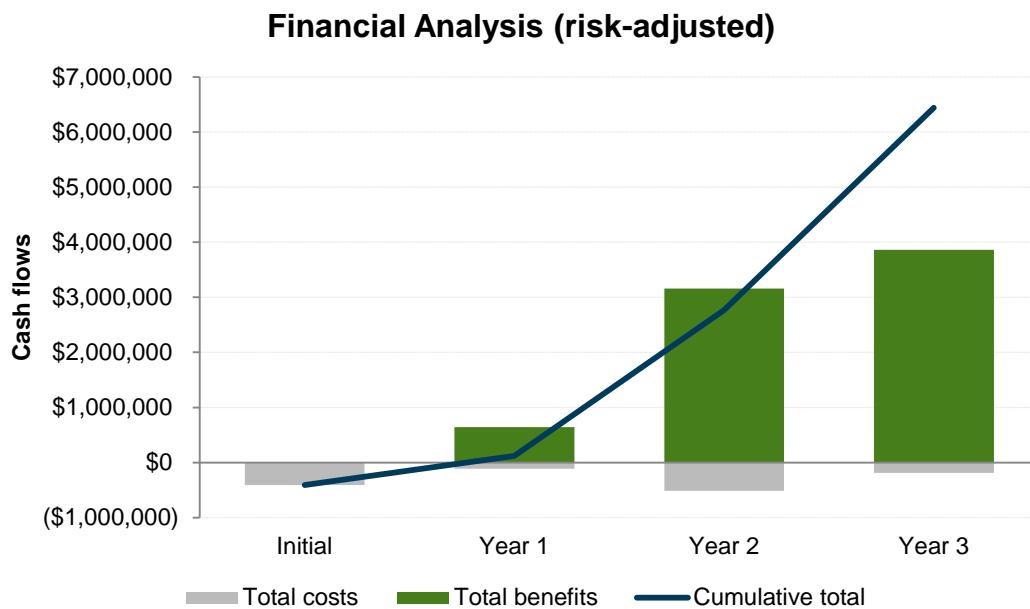
Table 10 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates for the composite organization. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

Financial Summary

The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the composite organization's investment in the K2 blackpearl 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 Risks section to the unadjusted results in each relevant cost and benefit section.

FIGURE 3
Cash Flow Chart (Risk-Adjusted)



Source: Forrester Research, Inc.

TABLE 11
Cash Flow (Risk-Adjusted)

Summary	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total costs	(\$407,985)	(\$111,890)	(\$513,480)	(\$189,030)	(\$1,222,385)	(\$1,076,088)
Total benefits	\$0	\$642,990	\$3,157,000	\$3,862,910	\$7,662,900	\$6,095,889
Total	(\$407,985)	\$531,100	\$2,643,520	\$3,673,880	\$6,440,515	\$5,019,801
ROI						466%
Payback period (months)						9.2

Source: Forrester Research, Inc.

K2 blackpearl: Overview

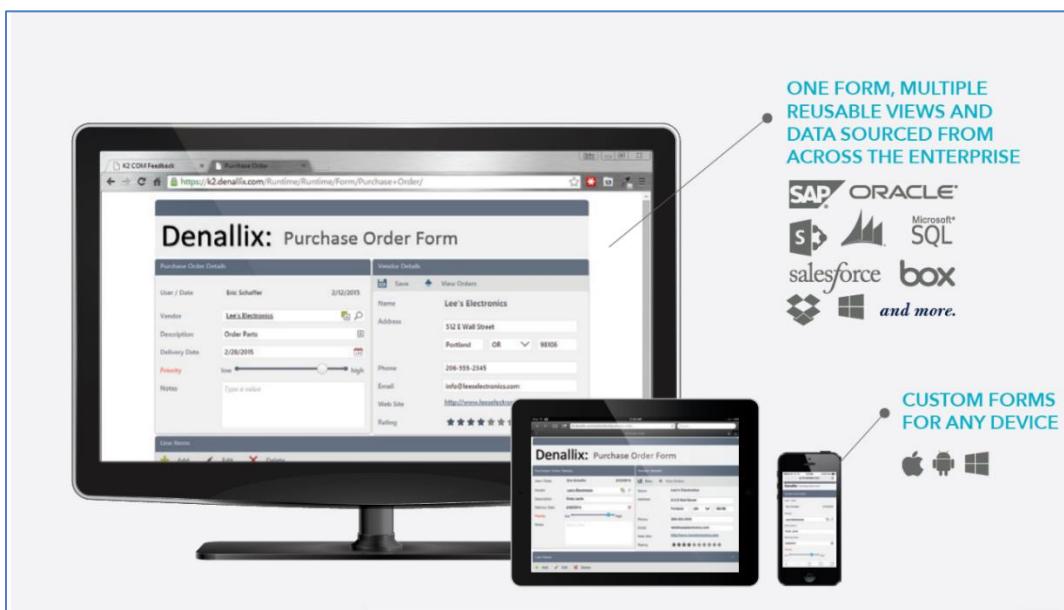
The following information is provided by K2. Forrester has not validated any claims and does not endorse K2 or its offerings.

K2 turns complex work into powerful business process applications. With K2's business process application platform, organizations can use visual designers to rapidly build and deploy low-code applications that are agile, scalable, and reusable, resulting in modern processes that quickly and easily connect people, data, decisions, and systems. K2 delivers information to the right people at the right time, empowering them to accelerate their work and become more efficient online, offline, and from any device.

K2 blackpearl® enables customers to build, run, and scale their business applications — from simple workflows for expense claims or travel authorization to complex business-critical applications such as case management, contracts management, or any other processes that meet their business needs, the low-code way.

K2 blackpearl® offers an enterprise-ready business process application platform with:

- Workflows that can be built rapidly with little to no code using our intuitive visual designers.
- Powerful, fully customizable SmartForms to capture and display information on any device and can be reused across any of your apps.
- Data integration from line-of-business systems, cloud platforms and SaaS service any application using our patented SmartObjects. REST or web services.
- Apps that are mobile ready with a simple click. Mobilize your workforce with the K2 Mobile app, now available on any device, online and offline.
- Customizable reports and dashboards that enable data-driven business decisions and eliminate bottlenecks.
- A centralized, intuitive and customizable WorkDesk where it's easy to review and action all pending tasks and approvals across all business applications to reduce complexity and boost productivity.
- Preconfigured, fully functional sample applications, called SmartStarters, built by K2 to help customers quickly get started creating apps for common scenarios.



K2 blackpearl is helping to address the challenges faced by customers by empowering them to:

1. Work smarter, increase agility and accelerate business.

K2 blackpearl is helping customers to significantly reduce IT backlogs by enabling tech-savvy users to accelerate the creation of business applications using visual designers and reusable components.

2. Boost productivity from anywhere on any device.

K2 blackpearl is helping customers to transform their businesses by improving operational efficiency and staff productivity by delivering information and work to them in real-time, enabling them to engage from any device — wherever they may be.

3. Manage for today, future-proof for tomorrow. K2 is helping customers connect to the many systems they currently own while successfully setting them up for the future and there is no need for “rip and replace”.

Around the world, there are more than a million people in 80+ countries using K2 to save money, reduce risk and grow revenue. Large and mid-size enterprise customers alike have seen the value of business and IT working hand-in-hand when driving solutions instead of traditional IT-led efforts. To see how customers are automating their business processes more quickly and digitally transforming their business visit <http://www.k2.com/customers>.

TEI Framework And Methodology

INTRODUCTION

From the information provided in the interviews, Forrester has constructed a Total Economic Impact (TEI) framework for those organizations considering implementing the K2 blackpearl business application platform. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision.

APPROACH AND METHODOLOGY

Forrester employed four fundamental elements of TEI in modeling K2's blackpearl platform: benefits, costs, flexibility, and risks.

Forrester took a multistep approach to evaluate the impact that K2 blackpearl can have on an organization (see Figure 2). Specifically, we:

- Interviewed K2 marketing and sales, along with Forrester analysts, to gather data relative to the blackpearl platform and the marketplace for low-code application development platforms and business process management solutions.
- Interviewed three organizations currently using K2's blackpearl platform to obtain data with respect to costs, benefits, and risks.
- Designed a composite organization based on characteristics of the interviewed organizations (see the Analysis section of this document for a description of the organization).
- 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 as applied to the composite organization.
- 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.

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.

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: 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 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 C: 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 Source: "The Business Impact Of Customer Experience, 2014," Forrester Research, Inc., March 27, 2014.