

FORRESTER®

The Total Economic Impact™ Of SAP Cloud Platform Rapid Application Development by Mendix

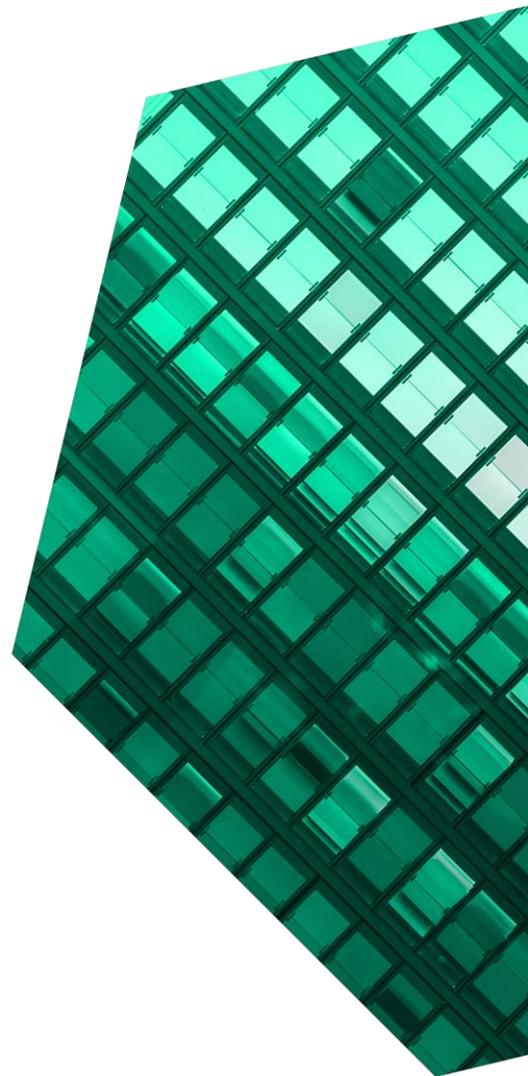
Cost Savings And Business Benefits
Enabled By SAP CP RAD by Mendix

AUGUST 2020

Table Of Contents

Consulting Team: Nick Mayberry

Executive Summary	1
The SAP CP RAD By Mendix Customer Journey .	6
Key Challenges	6
Investment Objectives	7
Composite Organization	7
Analysis Of Benefits	8
Reduced Cost To Develop Applications Internally .	8
reduced Time-To-Value From Applications.....	10
Reduced Cost Of Outsourced Application Development	12
Unquantified Benefits	13
Flexibility.....	13
Analysis Of Costs	15
Cost Of Licensing Fees	15
Cost Of Planning And Implementation	16
Cost Of Training	17
Financial Summary	18
Appendix A: Total Economic Impact	19



ABOUT FORRESTER CONSULTING

Forrester Consulting provides independent and objective research-based consulting to help leaders succeed in their organizations. For more information, visit forrester.com/consulting.

© 2020, Forrester Research, Inc. All rights reserved. Unauthorized reproduction is strictly prohibited. Information is based on the best available resources. Opinions reflect judgment at the time and are subject to change. Forrester®, Technographics®, Forrester Wave, RoleView, TechRadar, and Total Economic Impact are trademarks of Forrester Research, Inc. All other trademarks are the property of their respective companies.

Executive Summary

SAP CP RAD by Mendix is a low-code application development platform that accelerates development processes and the time-to-value of applications. Interviewed organizations achieved application development acceleration rates between **four times** and **12 times**, with an average reduction in development time of **88%** and a **94%** average reduction in cost to develop. Customers decreased internal application development resources per application by **50%** and diminished outsourced application development costs by **63%**.

SAP commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by utilizing [SAP Cloud Platform Rapid Application Development by Mendix](#) (SAP CP RAD by Mendix). The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of SAP CP RAD by Mendix on their organizations. SAP CP RAD by Mendix is a low-code application development tool that leverages visual development, modular development components, and close integration with SAP to accelerate customer organizations' time to develop and, by extension, the time-to-value of using these applications.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed two customers with experience using SAP CP RAD by Mendix. For the purposes of this study, Forrester aggregated the experiences of the interviewed customers and combined the results into a single [composite organization](#).

Prior to using SAP CP RAD by Mendix, the customers used code-heavy, text-based programming environments. As business demand for applications exceeded IT resources, the use of these time-intensive programming environments negatively impacted operational efficiency for both application developers as well as for organization employees more broadly. It left customers with lengthy application development timelines compounded by

KEY STATISTICS



Return on investment (ROI)

203%



Net present value (NPV)

\$2.96M

increasing business demand for applications. This generated persistent and growing application backlogs.

After the investment in SAP CP RAD by Mendix, the customers accelerated their application development processes by an average of 14 months. Key results from the investment include a reduction in time to develop applications, a reduction in internal resources needed to develop applications, an improvement in time-to-value of these applications, and a reduction in outsourced development expenses.

Reduction in internal development costs

94%



KEY FINDINGS

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

- **Reduction in internal application development costs of 94%.** The average application development timeline decreased by 88%, from 16 months to two months, while the internal development resources per application decreased by 50%. Over three years and a cumulative total of 24 applications developed, the shorter and less resource-intensive development cycle is worth approximately \$2.4 million to the composite organization.
- **Reduction in time-to-value from applications of 88%.** The shortened application development time led to an improved time-to-value of newly developed applications. For the composite organization, three-quarters of developed applications achieve a 5% productivity increase for an average of 100 end-user employees each. Over three years and with an assumed 30% productivity recapture rate, the reduced time-to-

value from applications is worth approximately \$1.6 million to the composite organization.

- **Reduction in cost of outsourced application development of 63%.** The increase in application development speed allowed the interviewed organizations to reduce their reliance and expenses on outsourced application development. For the composite organization, assuming it previously outsourced 50% of its applications, each application costs \$100,000, and it reduces the use of outsourced development by 75% by Year 3, it is able to reduce outsourced application expenses by 63% for a total three-year present value of \$413,685.

Unquantified benefits. Benefits not quantified for this study include:

- **Improved collaboration with business partners.** With accelerated development times, the interviewed organizations were able to incorporate feedback from business stakeholders more quickly than in their prior environments. This improved collaboration resulted in enhanced

“ In close to two years, we’ve built and rolled out 24 applications. Without SAP CP RAD by Mendix, we would not have gotten to half that number.”

— Senior manager of enterprise applications, retail

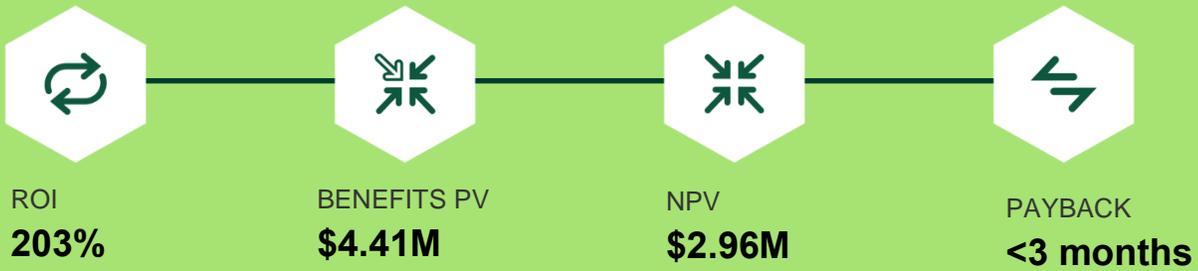
iteration, more agile development, more experimentation, and increased creativity in application development.

- **Increased time-to-value of revenue-generating apps.** Accelerating application development led to improved time-to-value. Although both interviewed customers only developed employee applications, customer applications developed in an accelerated fashion could bring revenue generated by those applications forward in time by 14 months.

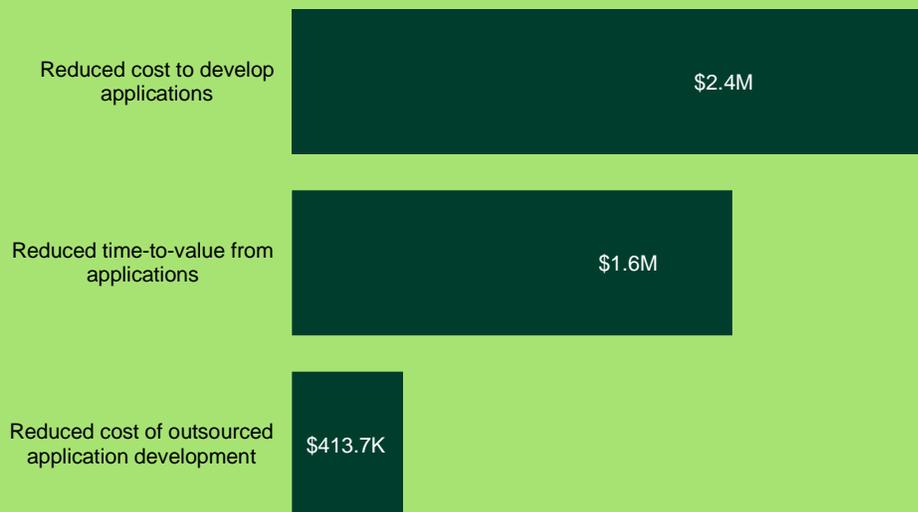
Costs. Risk-adjusted PV costs include:

- **Cost of licensing.** SAP CP RAD by Mendix is priced on a per-end-user basis. Assuming end users increase from 400 to 1,200 over three years, the total three-year cost of licensing is \$1,355,612.
- **Cost of planning and implementation.** Planning and implementation span approximately one week, and they require internal and optional external resources. The total cost of planning and implementation is \$26,840.
- **Cost of training.** Training costs include both the time costs of internal resources being trained as well as the cost of an external consultant. Training costs are \$76,560.

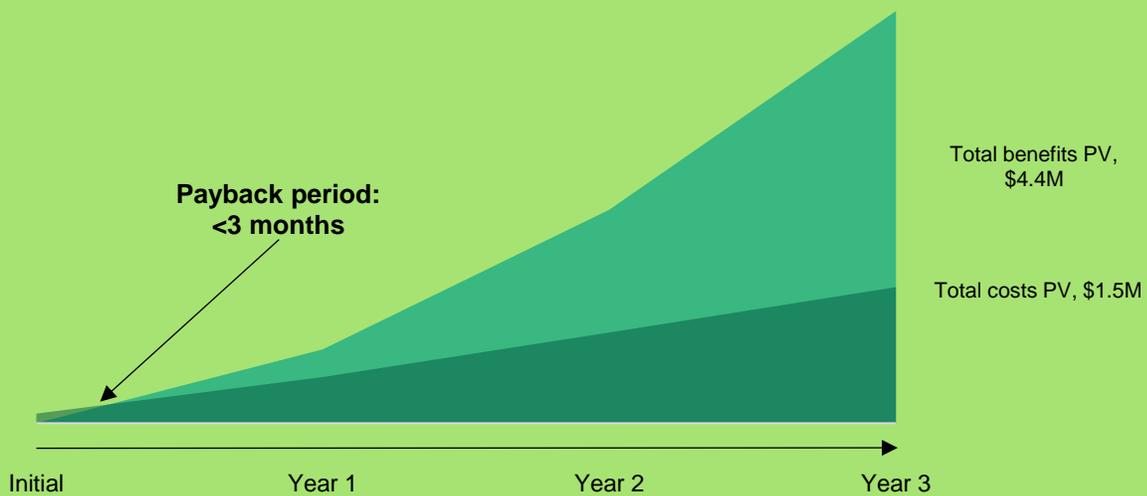
The customer interviews and financial analysis found that the composite organization experiences benefits of \$4.41 million over three years versus costs of \$1.46 million, adding up to a net present value (NPV) of \$2.96 million and an ROI of 203%.



Benefits (Three-Year)



Financial Summary



TEI FRAMEWORK AND METHODOLOGY

From the information provided in the interviews, Forrester constructed a Total Economic Impact™ framework for organizations considering an investment in SAP CP RAD by Mendix.

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 SAP CP RAD by Mendix can have on an organization.

DISCLOSURES

Readers should be aware of the following:

This study is commissioned by SAP 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 SAP CP RAD by Mendix.

SAP 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.

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



DUE DILIGENCE

Interviewed SAP stakeholders and Forrester analysts to gather data relative to SAP CP RAD by Mendix.



CUSTOMER INTERVIEWS

Interviewed two decision makers at organizations using SAP CP RAD by Mendix to obtain data with respect to costs, benefits, and risks.



COMPOSITE ORGANIZATION

Designed a composite organization based on characteristics of the interviewed 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 interviewed organizations.



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 SAP CP RAD By Mendix Customer Journey

■ Drivers leading to the SAP CP RAD by Mendix investment

Interviewed Organizations			
Industry	Region	Interviewees	Revenues FTEs Developers
Food and agriculture	EMEA	Manager of ICT	\$250 million in revenue 800 FTEs 2 developers
Retail	North America	Senior manager of business systems Senior manager of enterprise applications Application developer	\$20 billion in revenue 25,000 FTEs 20+ developers

KEY CHALLENGES

Before investing in SAP CP RAD by Mendix, the interviewed customers were relying on code-heavy application development environments and using outsourced development resources to speed application development timelines.

They struggled with these common challenges:

- Protracted application development timelines.** The customers described a pre-investment environment with lengthy application development timelines. Several factors impacted these timelines, including:
 - Time-intensive coding processes utilizing text-based programming environments.
 - The practice of rewriting similar code from scratch in multiple applications.
 - The steep learning curves of code-heavy development environments.
 - Complexity in updating applications.
 - Complexity in deploying apps for use by business end users.
- Application development backlogs.** The increasing demands of business users for more applications compounded protracted application development timelines. As this business demand

“It was taking a long time to develop apps internally, and we started to experience an application backlog. We needed a solution to develop apps more quickly while providing a rich user experience.”

Senior manager of enterprise applications, retail

outstripped IT resources, the interviewed customers experienced extensive application backlogs. For example, the senior manager of enterprise applications from the retail industry reported a five- to six-year backlog for application development.

“SAP CP RAD by Mendix enabled us to speed up all application development. But a core driver for us was the ability to quickly leverage all our SAP data and transactions in newly built apps.”

Senior manager of business systems, retail

INVESTMENT OBJECTIVES

The interviewed organizations searched for a solution that could:

- Quickly leverage the data and transactions already in their SAP systems to provide extended capabilities to their SAP platforms.
- Provide a modern user interface (UI) for both application developers and business end users.
- Reduce the time it takes to develop applications.

COMPOSITE ORGANIZATION

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

Description of composite. The global organization operates in the retail industry with \$3 billion in annual revenue and 4,000 full-time employees. It has a lean but talented team of 10 application developers and it has supplemented this team by relying on outsourced development resources with mixed results. However, a persistent application backlog continues to grow as business units discover additional development needs. The firm fears it may fall behind competitors if it cannot deploy important, time-saving applications to employees across its organization soon. It is looking for a solution to speed up application development, get applications into employees' hands faster, and better control the functionality and quality of these employee applications by relying less on outsourced development.

Deployment characteristics. Although the organization is looking to clear its backlog of applications as quickly as possible, it is taking a phased approach with its low-code development

platform. Its goal is to develop a total of 24 applications using the platform over the course of three years. Approximately three-quarters of these applications are aimed at making an average of 100 employee end users each more efficient in their daily tasks. Lastly, the organization aims to shift all application development in house over time, providing better control over both these applications and the strategic future of the business.

Key assumptions

- **\$3B annual revenue**
- **4,000 FTEs**
- **10 developers**
- **100 employee end users per app**
- **50% of applications previously outsourced**

Analysis Of Benefits

■ Quantified benefit data as applied to the composite

Total Benefits						
Ref.	Benefit	Year 1	Year 2	Year 3	Total	Present Value
Atr	Reduced cost to develop applications internally	\$491,625	\$983,250	\$1,474,875	\$2,949,750	\$2,367,631
Btr	Reduced time-to-value from applications	\$340,200	\$680,400	\$1,020,600	\$2,041,200	\$1,638,379
Ctr	Reduced cost of outsourced application development	\$37,688	\$150,750	\$339,188	\$527,625	\$413,685
	Total benefits (risk-adjusted)	\$869,513	\$1,814,400	\$2,834,663	\$5,518,575	\$4,419,695

REDUCED COST TO DEVELOP APPLICATIONS INTERNALLY

Evidence and data. The interviewed customers saw reduced costs from developing applications internally with SAP CP RAD by Mendix. The solution brings developer time savings by abstracting development away from the underlying code, and it enables a modular, drag-and-drop approach to programming. Developers can leverage off-the-shelf components or build custom components to reuse in future applications, expediting their development. Further acceleration is achieved by close integration with SAP, allowing for simple inclusion of SAP system calls and one-click deployment to various runtime environments.

The manager of ICT from the food and agriculture industry was impressed by the “raw speed” of the

platform, sharing that his organization has seen application development accelerated between five times and 12 times. For example, he described his development team building an application to monitor insect population growth for the firm’s partner farmers in the span of 10 days.

“It took me 2 hours to build an application all by myself, and I have not been developing for 25 years.”

Manager of ICT, food and agriculture

Customer-Reported Application Development Acceleration Rates

Customer	Application use case	Est. prior time to develop	New time to develop	Acceleration rate
Retail	Field operations	12 months	3 months	4x
Food and agriculture	Field health	50 days	10 days	5x
Retail	Customer care	18 months	2 months	9x
Food and agriculture	Quality assessment	30 months	2.5 months	12x

The senior manager of enterprise applications from the retail industry cautioned that the amount of acceleration achieved by SAP CP RAD by Mendix “really depends on the complexity of the desired application and on the skills of the developer in question.” However, this customer saw application development acceleration rates ranging from four times to nine times.

While experiencing a boost to application development speed, the interviewed customers also achieved reductions in development costs by scaling down development resources assigned to each application. The senior manager of enterprise applications from the retail industry reported: “Not only would we have never cleared our application backlog without SAP CP RAD by Mendix, but we would have been using twice to thrice the number of resources to do it.”

“It’s a really fast development tool with a relatively flat learning curve. My team was trained and productive on the platform in less than a week.”

Senior manager of enterprise applications, retail

Modeling and assumptions. Based on the customer interviews, Forrester estimates for the composite organization:

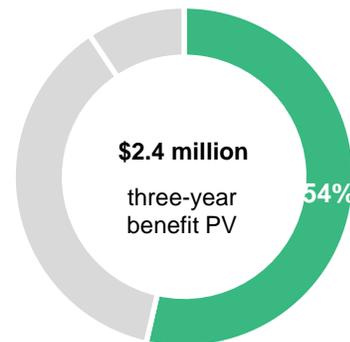
- Two developers previously developed each application. This is reduced to one developer per application.
- The average fully burdened annual rate for a developer is \$125,000.

Risks. The actual improvement in application development costs will vary based on:

- The number of applications developed annually.
- The average previous timeline for application development.
- The amount of internal resources previously devoted to developing each application.

To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of \$2.4 million

Reduced cost to develop applications internally: 54% of total benefits



- Four applications developed in Year 1, increasing to eight applications in Year 2 and 12 applications in Year 3.
- It previously developed 50% of applications internally.
- Developers previously spent 80% of their time on development-related tasks over the course of 16 months. This is reduced to two months.

Reduced Cost To Develop Applications Internally: Calculation Table

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
A1	Number of applications developed annually	Interviews	4	8	12
A2	Percent of applications previously developed in house	Assumption	50%	50%	50%
A3	Prior developer time needed to develop an application	Interviews: 80% * 16 months	1.1	1.1	1.1
A4	Prior number of developers required to develop an application	Interviews	2	2	2
A5	New developer time needed to develop an application	Interviews: 80% * 2 months	0.13	0.13	0.13
A6	New number of developers required to develop an application	Interviews	1	1	1
A7	Fully burdened annual rate per developer	Industry average	\$125,000	\$125,000	\$125,000
At	Reduced cost to develop applications internally	$(A1 \cdot A2 \cdot A3 \cdot A4 \cdot A7) - (A1 \cdot A2 \cdot A5 \cdot A6 \cdot A7)$	\$517,500	\$1,035,000	\$1,552,500
	Risk adjustment	↓5%			
Atr	Reduced cost to develop applications internally (risk-adjusted)		\$491,625	\$983,250	\$1,474,875
Three-year total: \$2,949,750			Three-year present value: \$2,367,631		

REDUCED TIME-TO-VALUE FROM APPLICATIONS

Evidence and data. As the interviewed organizations succeeded in deploying applications more rapidly, they reduced the time-to-value related to those applications. Both customers mainly utilized SAP CP RAD by Mendix to develop employee applications that were aimed at streamlining and, in some cases, automating employees’ workloads.

For example, the customer from the food and agriculture industry developed an application aimed at tracking local humidity and temperature, advising farmers of the potential risk of fungi. This saved these end users valuable time they previously spent tracking the data themselves and enabled them to spend more time on tasks like pest control. This same customer also developed a payment settlement application that automated the settlement process and reduced the workload of its finance department.

“SAP CP RAD by Mendix has allowed us to quickly develop and deploy apps to field employees, saving them valuable time and costs. But it is not just time savings. We also have prevented data loss this way.”

Senior manager of enterprise applications, retail

Similarly, the customer from the retail industry developed an application for use by its employees responsible for real estate acquisition. The application allowed these users to capture locations, photos, notes, municipal information, and utility data related to potential real estate acquisitions. In addition to preventing the loss of this information, the

application reduced the time spent at each location and the number of trips needed to accurately survey locations. This customer also developed applications to streamline vehicle care operations and fuel purchasing.

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

- An average decrease in application development time of 14 months.
- Three-quarters of newly developed applications are aimed at streamlining employee operations.
- Each application has an average target user base of 100 employees.
- Each application improves employee efficiency by an average of 5%.
- The average fully burdened annual rate for each of these employees is \$70,000.
- A productivity recapture rate of 30%.

Risks. The improved efficiency responding to unplanned network outages will vary with:

- The number of newly developed applications that streamline employee operations.
- The number of employees using these applications.
- The ability of these applications to increase employee efficiency.
- The average fully burdened annual rate of these employees.

To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$1.6 million.

Reduced Time-To-Value From Applications: Calculation Table					
Ref.	Metric	Calculation	Year 1	Year 2	Year 3
B1	Decrease in application delivery time in years	Interviews: 16 months to 2 months	1.2	1.2	1.2
B2	Number of SAP CP RAD by Mendix-developed applications improving employee efficiency	Assumption; $3/4 * A1$	3	6	9
B3	Employees affected	Assumption: $B2 * 100$	300	600	900
B4	Average improvement to efficiency from automating and streamlining work with SAP CP RAD by Mendix applications		5%	5%	5%
B5	Average employee fully burdened annual rate	Forrester research	\$70,000	\$70,000	\$70,000
B6	Productivity recapture rate		30%	30%	30%
Bt	Reduced time-to-value from applications	$B1 * B3 * B4 * B5 * B6$	\$378,000	\$756,000	\$1,134,000
	Risk adjustment	↓10%			
Btr	Reduced time-to-value from applications (risk-adjusted)		\$340,200	\$680,400	\$1,020,600
Three-year total: \$2,041,200			Three-year present value: \$1,638,379		

REDUCED COST OF OUTSOURCED APPLICATION DEVELOPMENT

Evidence and data. The interviewed customers relied less on outsourced development resources after investing in SAP CP RAD by Mendix. The use of such resources was aimed at reducing application development timelines and the application backlogs they caused. By investing in SAP CP RAD by Mendix, the customers were able to bring application development back in house, reporting both better control over the applications themselves and, importantly, better control over the strategic future of their organizations.

“If we want to control the future of the company in terms of technology, then we’ve got to get to a place where we can in-house our application development. That’s another benefit of SAP CP RAD by Mendix: control of our destiny.”

Senior manager of business systems, retail

Modeling and assumptions. Based on the customer interviews, Forrester estimates for the composite organization:

- Outsourced resources developed 50% of applications.
- The average cost of these outsourced applications is \$100,000.
- There’s a reduction in the use of outsourced resources by 25% in Year 1, 50% in Year 2, and 75% in Year 3.

“In terms of application development, we’re building more and buying less.”

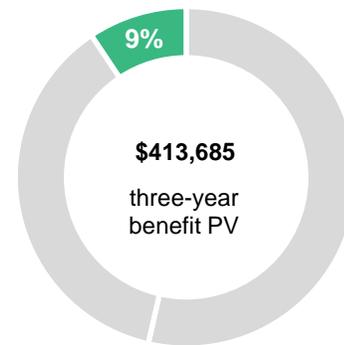
Manager of ICT, food and agriculture

Risks. The actual improvement in outsourced application development costs will vary based on:

- The amount of reliance on outsourced resources for application development.
- The average cost per application of outsourced development resources.
- The percent reduction in outsourced resources over time.

To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$413,685.

Reduced cost of outsourced application development: 9% of total benefits



Reduced Cost Of Outsourced Application Development: Calculation Table					
Ref.	Metric	Calculation	Year 1	Year 2	Year 3
C1	Number of applications developed annually	A1	4	8	12
C2	Prior percent of applications developed with outsourced resources	Assumption	50%	50%	50%
C3	Average cost of an outsourced application		\$100,000	\$100,000	\$100,000
C4	Cost to develop each application in house	A5*A6*A7	\$16,250	\$16,250	\$16,250
C5	Reduction in outsourced development	Assumption	25%	50%	75%
Ct	Reduced cost of outsourced application development	$((C1*C2*C3)-(C1*C2*C4))*C5$	\$41,875	\$167,500	\$376,875
	Risk adjustment	↓10%			
Ctr	Reduced cost of outsourced application development (risk-adjusted)		\$37,688	\$150,750	\$339,188
Three-year total: \$527,625			Three-year present value: \$413,685		

UNQUANTIFIED BENEFITS

Additional benefits that customers experienced but were not able to quantify include:

- Improved collaboration with business partners.** After implementing SAP CP RAD by Mendix, the interviewed customers experienced improved collaboration between application developers and business users. Because development times were accelerated, developers were able to receive feedback from business units and incorporate it more quickly than in their prior environments. This improved collaboration resulted in a more iterative way of working, the adoption of more agile development practices, and increased experimentation and creativity in the application development process.
- Increased time-to-value of revenue-generating apps.** Like the Reduced Time To Value Of Applications benefit, customers could also potentially experience increased time-to-value from any SAP CP RAD by Mendix-developed applications aimed at customers. Business value

in this case might be calculated by taking the additional profit generated by such applications and bringing it forward by the 14-month reduction in application development time that customers reported.

“SAP CP RAD by Mendix enabled us to move from a waterfall development model to agile development. It’s been quite liberating.”

Manager of ICT, food and agriculture

FLEXIBILITY

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

- **Transition to SAP S/4HANA.** The retail interviewee said their organization plans to transition from its current SAP HANA solution to SAP S/4HANA. Without SAP CP RAD by Mendix, the customer expects that it would have to rewrite all the extensions it currently has in SAP's Advanced Business Application Programming (ABAP) language, which would be a time-consuming process. With SAP CP RAD by Mendix, the customer expects to rewrite these extensions utilizing low-code development, speeding its full transition to SAP S/4HANA and the time-to-value of any associated benefits.

“In terms of future savings, we won't have to spend time rewriting our custom-developed SAP apps in ABAP. We'll be using SAP CP RAD by Mendix to recreate those, reducing our conversion time to SAP S/4HANA and any costs for expensive contractors.”

*Senior manager of business systems,
retail*

Flexibility in times of crisis. The interviewed customers reported that the increased flexibility provided by SAP CP RAD by Mendix protected their ability to continue application development during the COVID-19 pandemic. The manager of ICT from the food and agriculture industry reported: “It has not impacted our development at all. We are working from home, and we continue to have the same philosophy of rapid, agile development.”

- **Citizen development.** The customers also reported that SAP CP RAD by Mendix is so easy to use that they plan to allow business stakeholders to begin developing applications themselves. The senior manager of business systems from the retail industry shared: “We

currently have one citizen developer onboard, but we expect to expand the program in the near future once it's a bit more mature.” Citizen development carries the possibility of reducing application development costs even further if these citizen developers cost less per hour of development than professional developers do.

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

Analysis Of Costs

■ Quantified cost data as applied to the composite

Total Costs							
Ref.	Cost	Initial	Year 1	Year 2	Year 3	Total	Present Value
Dtr	Cost of licensing fees	\$0	\$432,000	\$576,000	\$648,000	\$1,656,000	\$1,355,612
Etr	Cost of planning and implementation	\$26,840	\$0	\$0	\$0	\$26,840	\$26,840
Ftr	Cost of training	\$76,560	\$0	\$0	\$0	\$76,560	\$76,560
	Total costs (risk-adjusted)	\$103,400	\$432,000	\$576,000	\$648,000	\$1,759,400	\$1,459,012

COST OF LICENSING FEES

Evidence and data. Currently, SAP CP RAD by Mendix is priced on a monthly per-user basis. In this case, users are employee end users who have access to the developed applications. The interviewed organizations achieved per-user price savings as the user base scaled.

For current pricing, customers should contact SAP directly.

Modeling and assumptions. Forrester estimates for the composite organization:

- On average, each newly developed application has a user base of 100 employees.

Risks. The cost of licensing fees will vary with:

- The total number of end users of newly developed applications.

As Forrester priced the composite organization directly with SAP, risk has not been incorporated into this cost, yielding a three-year, risk-adjusted total PV (discounted at 10%) of \$1.4 million.

Cost Of Licensing Fees: Calculation Table

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
D1	Total FTEs provided access to cloud platform applications	A1*100		400	800	1,200
D2	Annual cost per user			\$1,080	\$720	\$540
Dt	Cost of licensing fees	D1*D2	\$0	\$432,000	\$576,000	\$648,000
	Risk adjustment	↑0%				
Dtr	Cost of licensing fees (risk-adjusted)		\$0	\$432,000	\$576,000	\$648,000
Three-year total: \$1,656,000			Three-year present value: \$1,355,612			

COST OF PLANNING AND IMPLEMENTATION

Evidence and data. The interviewed customers reported a one-week planning and implementation process. This process required approximately six stakeholders including a core developer, an SAP internal consultant, and four business stakeholders for various percentages of their time. The customers also reported using an external implementation consultant for executing its most vital applications.

“There’s nothing I experienced working with SAP CP RAD by Mendix that I would’ve needed to have known beforehand. There was not a single bad surprise.”

Manager of ICT, food and agriculture

Modeling and assumptions. Forrester estimates for the composite organization include:

- One week of core developer time at a fully burdened hourly rate of \$60.
- One week of internal SAP consultant time at a fully burdened hourly rate of \$40.
- Two hours each of four business stakeholders’ time at a fully burdened hourly rate of \$50.
- A one-time external implementation consultant fee of \$20,000.

Risks. The cost of planning and implementation will vary with:

- The number, time committed, and fully burdened hourly rate of the internal stakeholders involved in planning and implementation.
- The choice to use an external implementation consultant.

To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV of \$26,840.

Cost Of Planning And Implementation: Calculation Table						
Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
E1	Core developer time required in hours	1 FTE x 1 week	40			
E2	Fully burdened hourly rate for core developer	A7/2,080	\$60			
E3	Internal SAP consultant time required in hours	1 FTE x 1 week	40			
E4	Fully burdened hourly rate for internal SAP consultant		\$40			
E5	Business stakeholders time required	4 FTEs x 2 hours	8			
E6	Fully burdened hourly rate for business stakeholders		\$50			
E7	Subtotal internal time cost of planning and implementation	$E1 * E2 + E3 * E4 + E5 * E6$	\$4,400			
E8	Cost of external implementation consultant for vital applications		\$20,000			
Et	Cost of planning and implementation	E7+E8	\$24,400	\$0	\$0	\$0
	Risk adjustment	↑10%				
Etr	Cost of planning and implementation (risk-adjusted)		\$26,840	\$0	\$0	\$0
Three-year total: \$26,840			Three-year present value: \$26,840			

COST OF TRAINING

Evidence and data. Customers reported training costs related to both the time cost of training and the use of an experience consultant during training and early development. Training time amounted to two days for internal staff using an online training tool. The experience consultant was on hand during this training and remained on premises during the first two months of development to transfer knowledge and support developers.

Modeling and assumptions. Forrester estimates for the composite organization include:

- Two days of training attended by all 10 developers.
- A fully burdened hourly rate per developer of \$60.
- Two months of external experience consultant time at a rate of \$1,000 daily.

Risks. The cost of licensing fees will vary with:

“Working alongside another senior and external party really helped the team to quickly start being very productive.”

Manager of ICT, food and agriculture

- The amount of training required and the number of attendees at training.
- The fully burdened hourly rate of training attendees.
- The choice of using an external experience consultant and the associated cost.

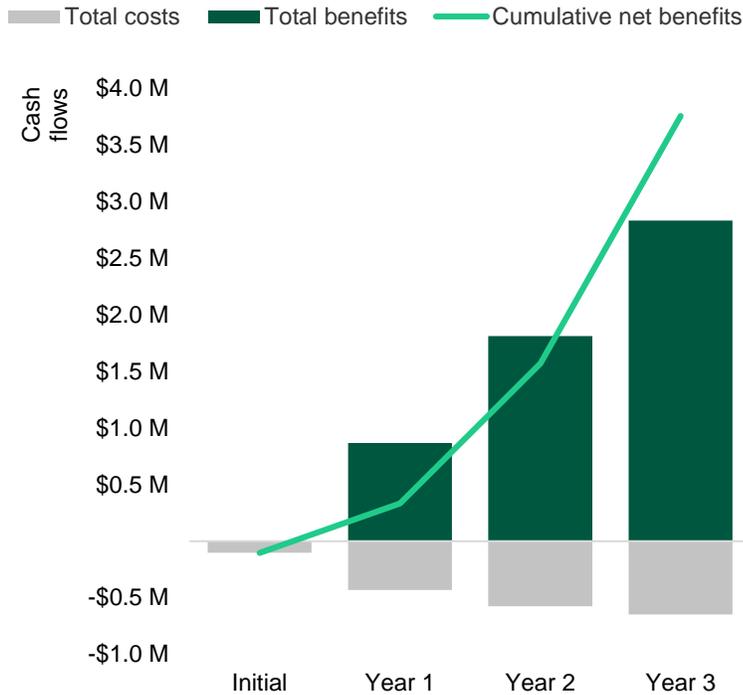
To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV of \$76,560.

Cost Of Training: Calculation Table						
Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
F1	Length of training per developer in hours	Interviews: 2 days	16			
F2	Number of developers	Composite	10			
F3	Fully burdened hourly rate for developers	E2	\$60			
F4	Cost of external experience consultant	Interviews: 2 months at \$1,000 daily	\$60,000			
Ft	Cost of training	$(F1 * F2 * F3) + F4$	\$69,600	\$0	\$0	\$0
	Risk adjustment	↑10%				
Ftr	Cost of training (risk-adjusted)		\$76,560	\$0	\$0	\$0
Three-year total: \$76,560			Three-year present value: \$76,560			

Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)



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

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

Cash Flow Analysis (Risk-Adjusted Estimates)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total costs	(\$103,400)	(\$432,000)	(\$576,000)	(\$648,000)	(\$1,759,400)	(\$1,459,012)
Total benefits	\$0	\$869,513	\$1,814,400	\$2,834,663	\$5,518,575	\$4,419,695
Net benefits	(\$103,400)	\$437,513	\$1,238,400	\$2,186,663	\$3,759,175	\$2,960,683
ROI						203%
Payback period (months)						<3

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."



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.

FORRESTER®