A Forrester Total Economic Impact™
Study Commissioned By IBM
July 2018

The Total Economic Impact™ Of IBM Watson Studio And Watson Knowledge Catalog

Cost Savings And Business Benefits Enabled By Watson Studio And Watson Knowledge Catalog

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ABOUT FORRESTER CONSULTING

Forrester Consulting provides independent and objective research-based consulting to help leaders succeed in their organizations. Ranging in scope from a short strategy session to custom projects, Forrester's Consulting services connect you directly with research analysts who apply expert insight to your specific business challenges. For more information, visit forrester.com/consulting.

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Key Benefits

Business value generated by more effective data science projects:

Almost $3 million in operating profit

Improved data-scientist productivity:

Four data-scientist hires avoided

Technology and consulting costs saved:

Over $800,000 in cost savings

Executive Summary

Businesses today are generating a lot of data about their customers, suppliers, products, and services. Enterprises are increasingly realizing that there is crucial value locked in that data, that if discovered, could transform organizations from being simply new market entrants to disruptive entities in their vertical. Yet many enterprises aren't providing the right tools to enable their data scientists and business analysts to quickly and easily find and access that data and build effective models. Siloed tools and disjointed workflows create inefficient handoffs and manual processes that hamper productivity for data scientists, data engineers, developers, and subject matter experts. Because of this, data scientists waste their time acquiring and preparing data instead of building machine learning and predictive models. Organizations must prioritize dramatically increasing the productivity of their data scientists. The result: analyze more data and create more models to accelerate more positive business outcomes.

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

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed and surveyed several customers with years of experience using Watson Studio and Watson Knowledge Catalog and their predecessor products. Watson Studio provides a suite of tools for data scientists, application developers, and subject matter experts to collaboratively and easily work with data and use that data to build, train and deploy machine learning models at scale. Watson Knowledge Catalog powers an intelligent, self-service discovery of data, models, and more, activating them for artificial intelligence, machine learning, and deep learning. Watson Studio and Watson Knowledge Catalog integrate into a single platform that provides access to each of these tools. Users can easily search Watson Knowledge Catalog for data sets and open them in Watson Studio to perform analyses.

Key Findings

Quantified benefits. The following risk-adjusted present value (PV) quantified benefits are representative of those experienced by the organizations interviewed and surveyed:

- **Major data science projects are more effective, generating $2.5 million in incremental revenue or cost savings per project.** With improved access to data and modeling tools, data scientists can drive more value on major projects. With an average operating margin of 10%, this equates to an incremental $750,000 in operating margin per project. Organizations attribute 40% of this increase to the IBM investment.
- **Using an integrated, collaborative platform improves data-scientist productivity.** On average, organizations can avoid up to four data-scientist hires due to improved productivity. With an average $180,000 fully loaded annual compensation, this translates to a total three-year savings of $1.2 million.

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ROI
459%

Benefits PV
$5.8 million

NPV
$4.8 million

Payback
<6 months

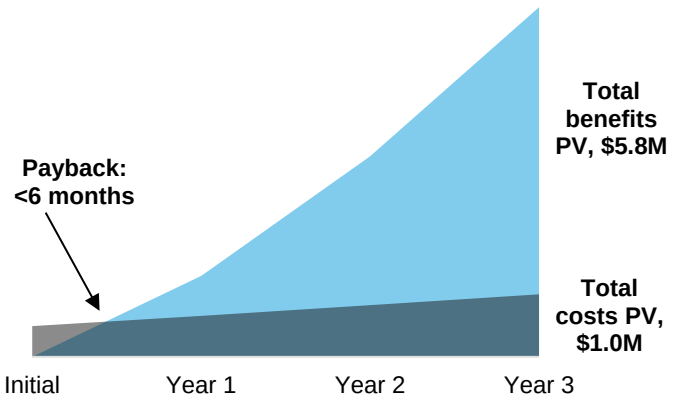
- **The IBM platform is a fully managed solution that replaces prior tools, reducing administrator overhead.** By Year 3, an average of over 3,000 administrator hours are saved per year. With an average $150,000 fully loaded annual compensation, this translates to a total three-year savings of $400,000.
- **Watson Knowledge Catalog helps organizations improve data governance policies, reducing the risk of penalties and fines from noncompliance.** On average, organizations avoid up to $270,000 in fines and penalties per year with improved rules and policies managed with Watson Knowledge Catalog.
- **Watson Studio and Watson Knowledge Catalog replace previous tools and consulting services used.** On average, organizations save $400,000 per year by replacing prior tools and using the new functionality provided by the platform to avoid consulting costs.

Costs. The organizations experienced the following risk-adjusted PV costs:

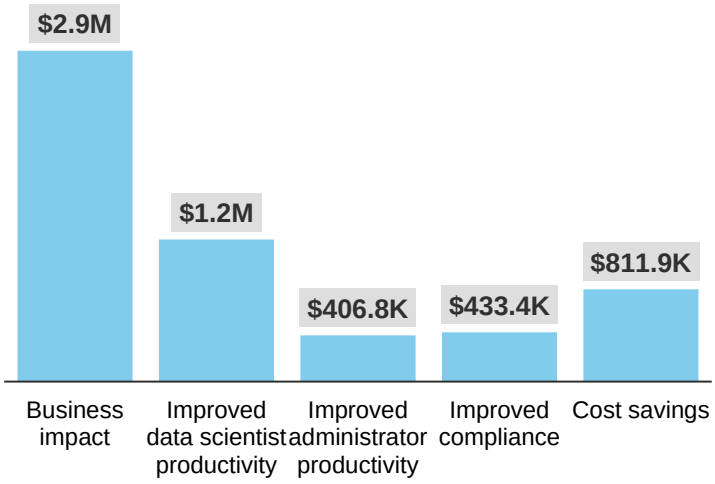
- **Organizations pay for Watson Studio and Watson Knowledge Catalog licenses.** License costs are based on the number of authorized users and the number of capacity hours utilized per month.
- **Organizations pay for professional services and spend incremental time on the implementation and initial models.** On average, organizations spend $100,000 on professional services for the implementation and two months of incremental time to build initial models. Between formal and on-the-job training, new users spend on average three days in training.

Forrester's interview with one existing customer, survey of 32 organizations, and subsequent financial analysis found that an organization based on these customers experienced benefits of $5.8 million over three years versus costs of $1 million, adding up to a net present value (NPV) of $4.8 million and an ROI of 459%.

Financial Summary



Benefits (Three-Year)



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TEI Framework and Methodology

From the information provided in the interviews and survey, Forrester has constructed a Total Economic Impact™ (TEI) framework for those organizations considering implementing IBM Watson Studio and Watson Knowledge Catalog.

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 IBM Watson Studio and Watson Knowledge Catalog can have on an organization:

The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

DUE DILIGENCE
Interviewed IBM stakeholders and Forrester analysts to gather data relative to Watson Studio and Watson Knowledge Catalog.

CUSTOMER INTERVIEWS AND SURVEY
Interviewed one organization and surveyed 32 organizations using Watson Studio, Watson Knowledge Catalog, and equivalent products to obtain data with respect to costs, benefits, and risks.

COMPOSITE ORGANIZATION
Designed a composite organization based on characteristics of the interviewed and surveyed organizations.

FINANCIAL MODEL FRAMEWORK
Constructed a financial model representative of the interviews and survey 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 IBM Watson Studio and Watson Knowledge Catalog's impact: benefits, costs, flexibility, and risks. Given the increasing sophistication that enterprises have regarding ROI analyses related to IT investments, Forrester's TEI methodology serves to provide a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

DISCLOSURES

Readers should be aware of the following:

This study is commissioned by IBM 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 IBM Watson Studio and Watson Knowledge Catalog.

IBM 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.

IBM provided the customer name for the interview but did not participate in the interview. Survey participants were sourced from a Forrester partner.

The Watson Studio And Watson Knowledge Catalog Customer Journey

BEFORE AND AFTER THE WATSON STUDIO AND WATSON KNOWLEDGE CATALOG INVESTMENT

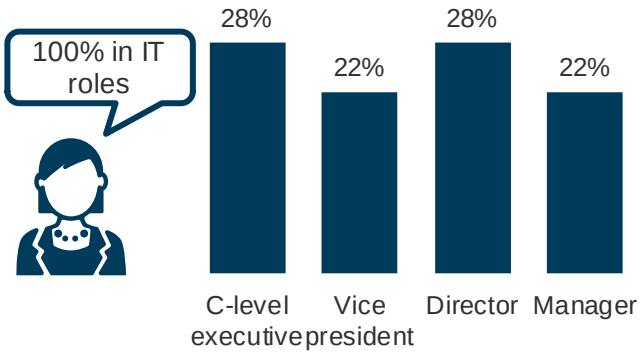
Interviewed Organization

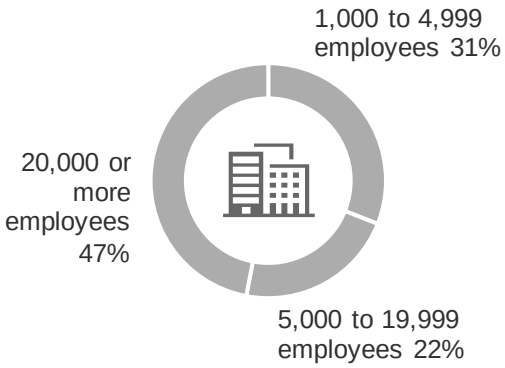
For this study, Forrester conducted an interview with an IBM Watson Studio and Watson Knowledge Catalog customer. The interviewed customer includes the following:

- An insurance organization based in the United States with more than 2,500 employees.
- The organization has been using Watson Studio and its predecessor product, Data Science Experience, for one year and Watson Knowledge Catalog and its predecessor product, Data Catalog, for six months.
- The organization currently has five users for Watson Studio and for Watson Knowledge Catalog.

Surveyed Organizations

For this study, Forrester surveyed 32 IT decision makers based in the United States:





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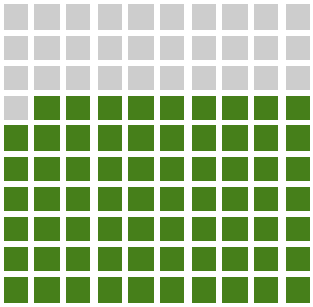
Key Challenges

The interviewed and surveyed organizations shared several challenges with their prior environment, including:

- **Siloed tools were expensive to maintain, and functionality gaps were filled by costly external consultants**. On average, organizations used between two to five tools for data science. These tools were not integrated, creating barriers to efficiency in data science tasks. Organizations also struggled to maintain these different tools, spending more time on version control and compatibility issues. When the tools lacked functionality to perform robust analyses, or when organizations lacked the skill to build models in these less user-friendly tools, organizations would turn to external consultants to build models at a significant cost. One organization said: "IBM was willing to assist us with any code help. Resources were an issue, and now we have technical capability that we didn't have without purchasing Watson Studio, without consultants and their fees. IBM has given me their expertise for the small cost of the application."
- **With data stored in several locations, data scientists spent a majority of their time finding and accessing data to use in data science projects.** On average organizations had ten different data sources, repositories, or databases. Data scientists would have to log in to different systems to search for and extract data. Data scientists would spend most of their time trying to figure out what data the organization had, accessing that data, and preparing the data to use in models. Some organizations implemented barriers to access with unproductive governance standards. One organization said: "The main issue is that you have no access to anything ever, right? You stumble over something all the time as an analyst and you're continually trying to find ways around the bureaucracy."
- **Difficulties in accessing data, using data in modeling tools, and writing code in existing tools limited data-scientist productivity.** Data scientists are a valuable and expensive resource for organizations (read more here). The more time a data scientist can spend building models, the more valuable insights an organization can receive to use in important business strategy decisions. Yet with teams working across siloed tools, struggling to find and access the data they need to build effective models (and spending too much time wrangling code in existing data science tools) data scientists spend too little time actually building models. One organization said, "I needed to be able to process greater volumes of data quickly and be independent of the latency issues and the bureaucracy that currently exists."

> "IBM was willing to assist us with any code help. Resources were an issue, and now we have technical capability that we didn't have without purchasing Watson Studio, without consultants and their fees. IBM has given me their expertise for the small cost of the application."
>
> *Financial informatics analyst, insurance company*

Siloed tools make collaboration between different roles difficult and time-consuming



69% agree

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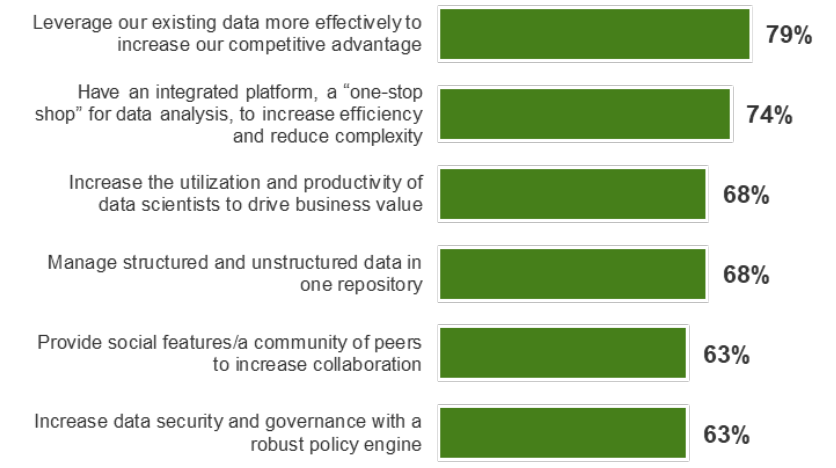
"What were your company's top 5 priorities/business objectives for introducing Watson Studio and/or Watson Knowledge Catalog?"



Base: 19 IT and business decision makers using Watson Studio and/or Watson Knowledge Catalog

Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, July 2018

› **Despite the time and cost spent to support and use these different tools, the insights delivered from models did not improve.** Survey respondents said that the single biggest challenge they faced prior to their Watson investment was that, "there were valuable insights in existing data, but it was too difficult for data scientists to find or access that data." In a fractured environment that uses multiple non-integrated tools, the ability to work collaboratively and to access data to build the most effective models is significantly diminished. In order to gain a competitive advantage, the organizations needed to streamline processes to make data more accessible, provide tools to support data-scientist productivity, and provide a platform that encourages collaboration.

"[The programming language] can be a real pain because the code gets kind of plunky if you start to build more analytical functions. You can spend three or four days writing code. There's the burden of writing code in [that language] which may work in [one database] but not work in [another database], and then putting it in the [analytics tool]. And on top of that, there's all the privacy concerns with the data, and so there's always something to think about to slow you down. I needed to be able to process greater volumes of data quickly and be independent of the latency issues and the bureaucracy that currently exists."

Financial informatics analyst, insurance company

Key Results

Key results from the Watson Studio and Watson Knowledge Catalog interview and survey include:

› **With an integrated platform, organizations can reduce the cost of analytical toolsets, administration overhead, and external consulting.** Organizations can replace some existing analytics tools and integrate data and modeling tools in one platform, creating a "one stop shop" for data analysis. In a managed-cloud environment, infrastructure and administration costs are significantly reduced, and data scientists can access new environments immediately. Open source tools can be used in a managed environment, reducing compatibility and version control issues. With improved functionality, the platform can bring more advanced analytical work in-house and reduce reliance on expensive consultants.

› **Having an integrated platform also increases access to data, collaboration, and data-scientist productivity.** Using Watson

"What we're doing is making the capability of our own company better, more self-sufficient, with advanced analytics instead of having consultants to do so."

Financial informatics analyst, insurance company

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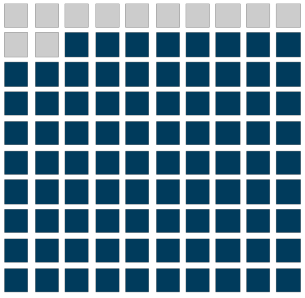
Knowledge Catalog and Watson Studio together creates efficiency throughout the data-science life cycle. Subject matter experts, data engineers, developers, and data scientists work together more efficiently to operationalize data. A unified interface provides seamless access to each of the tools, and data scientists can easily search the Knowledge Catalog for their data sets and open them in Watson Studio to start creating a model. The organization's data is in one place with Knowledge Catalog, structured and unstructured data, and administrators, data stewards, and chief data officers can easily create rules and policies to remain in compliance with security regulations and restrict access to sensitive information. Data scientists can quickly search the Knowledge Catalog for data, dramatically reducing the burden of acquiring and preparing data sets. Data scientists can then use programming languages they are familiar with in Watson Studio, as well as have access to new algorithms and programs. Collaborative features like access to a community of peers and shared resources increases skills development and speeds up model development. With time savings, data scientists can experiment more and build more models. With a click of a button, data scientists can deploy models into applications. Knowledge workers in analytical positions, or "citizen data scientists" also benefit from improved access to data and low-code modeling tools like SPSS Modeler.

- **Improving productivity across AI teams creates substantial business value.** By increasing access to data, improving collaboration between roles, and increasing the speed at which data scientists can build models, data scientists can spend more time generating and delivering valuable insights. Data scientists can also use Watson Studio to generate dashboards to more effectively share insights with business decision makers. One organization said: "I'm continually trying to communicate the financial picture to people. What does this look like? What story is it telling? It's part of business intelligence, because we've got ideas of things that we know will work, and now we can go about the task of proving it."

"Having an inclusive platform-based data scientist toolset with Watson Studio, eliminates a lot of boundaries within the organization that prevents newer technologies from being utilized. I've heard from other insurance colleagues that they'd love to use machine learning and other advanced analytics, but the selection of tools is so vast, training so varied, purchasing so complex, that they don't have the ROI to get it going. Governance strategies in organizations often serve to slow this way down. Watson Studio simplified the issues. That's how we were able to get ROI from machine learning and prove it out to others. I suspect in five years our analysis will be heavily dependent on machine learning as a result. It's already having tremendous impact on my internal customers, and I think that'll spread."

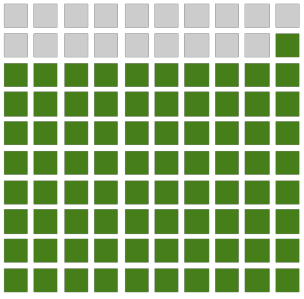
Financial informatics analyst, insurance company

Enterprises that improve access to data via an enterprise repository, unlocking the value of existing data, will be at a competitive advantage.



88% agree

Enterprises that optimize data scientist utilization, generating more effective and frequent business insights, will be at a competitive advantage.



81% agree

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Composite Organization

Based on the interviews and survey, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas financially affected. The composite organization is representative of the company that Forrester interviewed and the 32 organizations Forrester surveyed, and it is used to present the aggregate financial analysis in the next section. The composite organization that Forrester synthesized from the customer data has the following characteristics:

Description of composite. The composite organization is a global organization with 12,600 employees and $3.1 billion in annual revenue. The organization was previously using five different data science tools and has ten different data sources. The organization has a team of ten data scientists at the start of the investment in Watson Studio and Watson Knowledge Catalog

Deployment characteristics. The organization deploys both Watson Studio and Watson Knowledge Catalog via the IBM cloud. The organization integrates Watson Knowledge Catalog with existing data sources and replaces some prior analytics tools with Watson Studio. Ten data scientists are authorized users in the first year, growing to 14 data scientists by Year 3.

Key assumptions:

› 10 data scientists, growing to 14 by Year 3

› Using both Watson Studio and Watson Knowledge Catalog

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	Business impact	$720,000	$1,200,000	$1,680,000	$3,600,000	$2,908,490
Btr	Improved data-scientist productivity	$342,000	$513,000	$684,000	$1,539,000	$1,248,775
Ctr	Improved administrator productivity	$89,775	$178,125	$236,906	$504,806	$406,816
Dtr	Improved security and compliance	$90,000	$180,000	$270,000	$540,000	$433,434
Etr	Cost savings	$237,500	$332,500	$427,500	$997,500	$811,890
	Total benefits (risk-adjusted)	$1,479,275	$2,403,625	$3,298,406	$7,181,306	$5,809,405

Business Impact

One of the most significant benefits for interviewed and surveyed customers is the ability to efficiently generate and communicate important insights to business decision makers.

- The effectiveness of organizations' data science projects increases with Watson Studio and Knowledge Catalog. One hundred percent (100%) of survey respondents said that the increase in "effectiveness of models in driving business value" drove "some" or "a lot" of benefit for their organization. Organizations also experience an increase in the accuracy of their models by, on average, 6%.
- Watson Knowledge Catalog allows organizations to improve the speed and ease to data access. This allows data science teams to quickly acquire and prep useful data for their projects that was previously hidden in their various data sources.
- Watson Studio enables data scientists to increase their productivity in building models, and data scientists can use Watson Studio to experiment and iterate more efficiently.
- Data scientists can also improve their skill set with access to new tools and a community of peers. This allows many organizations to begin to in-source predictive modeling instead of relying solely on descriptive models. One organization started doing their own predictive analyses after their deployment and said: "We're now seeing that the changes made are financially substantial. I mean it was going to be a lot of money, like tens of million. And that's what we're seeing right now."
- Organizations also use Watson Studio to help convey insights to business decision makers. One organization said: "The dashboards will really help me because it's a really fast and easy way to create a great visualization that can be accessed by anyone, instead of using Excel spreadsheets. This looks better, and it doesn't clutter up your email."

The table above shows the total of all benefits across the areas listed below, 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 almost $6 million.

"We went from descriptive to trying to figure out what-if, trying to predict what would happen. IBM pre-packaged some codes to help get our feet wet. Then last year, I was able to turn over analysis to tell a business owner how much money his ideas were going to be worth. He was [making changes] for this year. And we're now seeing that those changes that he made are financially substantial."

Financial informatics analyst, insurance company

For the composite organization, Forrester assumes that:

- There are three major data science projects in Year 1, and this increases to seven projects by Year 3.
- Each major project generates $750,000 in net incremental business value. This equates to $2.5 million in incremental revenue or cost savings per project, with an average 10% operating margin.
- Forty percent (40%) of this incremental value delivered per project is attributed to the IBM investment.

Risks that affect these benefit estimates include:

- The ability to improve data access will depend on the data imported into the Knowledge Catalog and the access rules and policies that are implemented.
- Data science team effectiveness will depend on the degree of collaborative effort and the ability to develop new skills and learn new functionality.
- The number of major data science projects undertaken will depend on each individual business and the value placed on generating and incorporating data insights.

To account for these risks, Forrester adjusted this benefit downward by 20%, yielding a three-year risk-adjusted total PV of $2.9 million.

$2.5 million in incremental revenue or cost savings per project, equal to $750,000 in net operating profit per project

Impact risk is the risk that the business or technology needs of the organization may not be met by the investment, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for benefit estimates.

Business Impact: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
A1	Number of major projects per year	Interview/survey	3	5	7
A2	Average incremental business value per project	Interview/survey	$750,000	$750,000	$750,000
A3	Attribution to IBM Watson Studio and Knowledge Catalog	Interview/survey	40%	40%	40%
At	Business impact	A1*A2*A3	$900,000	$1,500,000	$2,100,000
	Risk adjustment	↓20%			
Atr	Business impact (risk-adjusted)		$720,000	$1,200,000	$1,680,000

Improved Data-Scientist Productivity

To achieve the incremental business value of the previous benefit category, data scientists leverage the functionality of the integrated IBM platform to improve their productivity.

- Before using an integrated platform, data scientists would use multiple tools to connect to data in many different systems and, based on the difficult governance of data across these disparate systems, may need to rely on IT to get access to important data. Then data scientists would spend significant time importing that data and preparing it for analysis. This left too little time for actual analytics work.
- With the integrated IBM platform, everyone works from a single unified interface, reducing manual work and hand offs and increasing the ability to collaborate. It's easier for administrators and data stewards to

set access rules and policies, and data scientists can share resources so that they don't always have to start building models from scratch. Subject matter experts work more efficiently with data scientists to validate the success of models, data engineers can better help data scientists transform models into production quality systems, and developers can more quickly build AI applications that meet business needs. Organizations can support the entirety of the data science life cycle, from refining data to production, all in one platform.

- With Watson Knowledge Catalog, organizations can handle structured and unstructured data in one platform, and they can capture and share models, dashboards, and notebooks. Data scientists save a significant amount of time on finding and preparing data.
- With Watson Studio, data scientists can: collaborate on the same model even if they are using different languages; use their favorite open source tools; and have access to machine learning, deep learning, and AI services. Data scientists or "citizen data scientists" who don't want to code or don't know how can use SPSS Modeler's drag-and-drop interface to build sophisticated analyses, helping organizations overcome the low supply of technical data scientists by leveraging these data savvy knowledge workers.
- One organization said, "The short keys help speed along learning the code quickly — something that would have taken me two days to write before, I can do it in an hour or two now." The interviewee also said: "The speed in which it ran [in Watson Studio] was much faster. So, it's not just that building it is faster, it's also, that once it runs, it runs pretty well. It saved a lot of time waiting on the results, playing with it, running results, playing with it, running results."
- The interviewee also noted: "I was making changes. It only took me like 20 or 30 minutes to make these changes and then resubmit and get the new analysis, while I was on the phone talking with them. Whereas in the [previous tool], it would have been like, 'Okay, this is going to take me until the end of the week.'"

For the composite organization, Forrester assumes that:

- In Year 1, the organization can avoid two data-scientist hires due to the improved productivity of existing staff and the improved ability to use knowledge workers or "citizen data scientists." This increases to four hires avoided by Year 3.
- The average fully loaded annual data-scientist compensation (including benefits) is $180,000.

Risks that affect these benefit estimates include:

- The improvement in data-scientist productivity will depend on the opportunity for efficiency in the prior environment and the adoption of the IBM platform.

To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year risk-adjusted total PV of $1.2 million.

"Data scientists are more productive due to the IBM investment."

"The length of data science projects is shorter due to the IBM investment."

Improved data-scientist productivity leads to four new hires avoided.

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Improved Data-Scientist Productivity: Calculation Table					
REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
B1	Data-scientist hires avoided	Interview/survey	2	3	4
B2	Average data scientist fully loaded compensation	Assumption	$180,000	$180,000	$180,000
Bt	Improved data-scientist productivity	B1*B2	$360,000	$540,000	$720,000
	Risk adjustment	↓5%			
Btr	Improved data-scientist productivity (risk-adjusted)		$342,000	$513,000	$684,000

Improved Administrator Productivity

The Watson Studio and Watson Knowledge Catalog products are fully managed on the IBM cloud, drastically reducing the amount of administrator overhead compared to the prior environment.

- Organizations noted that previous tools required system administration overhead, and the ability to replace those tools with Watson Studio or Watson Knowledge Catalog reduced the burden on administrators.
- One organization said: “It's substantial. The fact that it is self-managed was a huge deal with trying to get the purchase approved. I didn’t have to hire someone, because the admin would have screamed like, ‘We don't have time.’ Being fully managed by IBM was a huge piece of getting something done fast and being able to do it.”
- The organization also said, “Watson Studio and Knowledge Catalog always works, right? I’m good friends with the admin. [Our previous tool] — I mean, it’s a substantial part of the work that he does.”

For the composite organization, Forrester assumes that:

- In Year 1, administrators save a total of 1,310 hours, up to 3,458 hours saved by Year 3.
- The average fully loaded annual administrator compensation (including benefits) is $150,000, or $72 per hour.

Risks that affect these benefit estimates include:

- The ability to replace existing systems or tools with Watson Studio or Watson Knowledge Catalog.

To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year risk-adjusted total PV of $400,000.

Up to almost 3,500 administrator hours avoided by Year 3.

Improved Administrator Productivity: Calculation Table					
REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
C1	Administrator savings (hours)	Interview/survey	1,310	2,600	3,458
C2	Average administrator fully loaded compensation	$150,000/2,080	$72	$72	$72
Ct	Improved administrator productivity	C1*C2 (rounded)	$94,500	$187,500	$249,375
	Risk adjustment	↓5%			
Ctr	Improved administrator productivity (risk-adjusted)		$89,775	$178,125	$236,906

Improved Security And Compliance

One of the previous barriers to data was access controls. With a fractured environment, organizations' approaches to data governance could place unnecessary restrictions on the use of data.

- Watson Knowledge Catalog helps organizations' data stewards and chief data officers govern and anonymize data and control access and use. Organizations get more transparency into their data and how people use it. Its active policy engine applies layers of governance and control, and sensitive data can be automatically masked, ensuring that data is used correctly.
- With improved governance of data, organizations can avoid penalties and fines associated with fast changing regulations.

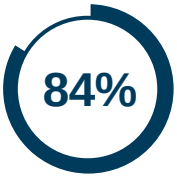
For the composite organization, Forrester assumes that:

- The composite organization avoided an average of $300,000 in fines per year by Year 3.

Risks that affect these benefit estimates include:

- The security and data governance efforts implemented in the prior environment and the ability to use Watson Knowledge Catalog to improve data governance.

To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year risk-adjusted total PV of $433,000.



"Security and compliance has improved due to the IBM investment."

Improved Security And Compliance: Calculation Table					
REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
Dt	Improved security and compliance	Interviews/survey	$100,000	$200,000	$300,000
	Risk adjustment	↓10%			
Dtr	Improved security and compliance (risk-adjusted)		$90,000	$180,000	$270,000

Cost Savings

In addition to enabling the benefits above, the Watson Studio and Watson Knowledge Catalog investment helps to lower overall costs.

› Organizations can replace prior analytics tools with Watson Studio and augment previous metadata management tools with Watson Knowledge Catalog. One organization said, “Once we have the IBM solution fully implemented, I would never open [our previous tool] again.”

› Organizations can also in-source model development from previously used consulting services.

For the composite organization, Forrester assumes that:

› The organization can save $100,000 per year on prior tool costs.

› The organization can save up to $350,000 on avoided consulting by increasingly insourcing work done by consultants over the three-year analysis.

Risks that affect these benefit estimates include:

› The number of analytics tools utilized in the prior environment, the ability to replace those tools with this investment, and the extent to which consulting services were used for predictive modeling.

To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year risk-adjusted total PV of $812,000.

> “Once we have the IBM solution fully implemented, I would never open [our previous tool] again.”
>
> *Financial informatics analyst, insurance company*

Cost Savings: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
E1	Cost saved by replacing prior tools	Interview/survey	$100,000	$100,000	$100,000
E2	Cost saved by avoiding consulting costs	Interview/survey	$150,000	$250,000	$350,000
Et	Cost savings	E1+E2	$250,000	$350,000	$450,000
	Risk adjustment	↓5%			
Etr	Cost savings (risk-adjusted)		$237,500	$332,500	$427,500

Flexibility

The value of flexibility is clearly unique to each customer, and the measure of its value varies from organization to organization. There are multiple scenarios in which a customer might choose to implement Watson Studio and Watson Knowledge Catalog and later realize additional uses and business opportunities, including:

› **Expanding the use of Watson Studio to more users and more lines of business.** Increasing the use of Watson Studio to generate more insights will provide additional productivity and business impact benefits.

› **Expanding the use of Watson Knowledge Catalog to include additional data sources.** The more data that can be included in Watson Knowledge Catalog, the more value will be delivered through increased productivity, improved security and compliance, and increased access to data to generate insights.

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

> Flexibility, as defined by TEI, represents an investment in additional capacity or capability that could be turned into business benefit for a 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.

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
Ftr	IBM license costs	$0	$187,000	$211,200	$235,400	$633,600	$521,405
Gtr	Implementation and training	$510,423	$0	$4,777	$4,777	$519,977	$517,960
	Total costs (risk-adjusted)	$510,423	$187,000	$215,977	$240,177	$1,153,577	$1,039,365

IBM License Costs

The table above shows the total of all costs across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total costs to be a PV of just over $1 million.

This is a direct cost to IBM to use Watson Studio and Watson Knowledge Catalog.

For the composite organizations, Forrester assumes that:

- The organization initially has 10 authorized users for Watson Studio, increasing to 14 by Year 3. With the initial fee, the organization can have up to 500 users for Watson Knowledge Catalog.
- The organization pays $11,000 per instance for Watson Studio and Watson Knowledge Catalog together.
- The organization uses 5,000 capacity hours per month, on average, for both Watson Studio and Watson Knowledge Catalog.

Risks that affect these cost estimates include:

- Software license costs are variable depending on the selected cost tier, volume discounts, and discounts based on other products licensed from the same vendor.

To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year risk-adjusted total PV of just over $520,000.

Implementation risk is the risk that a proposed investment may deviate from the original or expected requirements, resulting in higher costs than anticipated. The greater the uncertainty, the wider the potential range of outcomes for cost estimates.

IBM License Costs: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
F1	Number of authorized users	Interviews/survey		10	12	14
F2	Watson Studio and Catalog costs	per instance		$11,000	$11,000	$11,000
F3	Capacity hours per month	Assumption		5,000	5,000	5,000
F4	Cost per capacity hour	Assumption		$0.50	$0.50	$0.50
Ft	IBM license costs	(F1*F2)+ (F3*F4*12*2)	$0	$170,000	$192,000	$214,000
	Risk adjustment	↑10%				
Ftr	IBM license costs (risk-adjusted)		$0	$187,000	$211,200	$235,400

Implementation And Training

With this being a fully managed solution, the implementation and administration costs were not very high.

- Organizations use professional services to set up the solutions and provide help with building and deploying initial models. On average, organizations spend two months on upfront work for the initial models before productivity improvements begin.
- One organization said, “administration-wise, we were able to implement this application software into our enterprise without any administration cost.”
- Organizations mention that in addition to more formal training with IBM onsite, data scientists also have on-the-job training. Watson Studio is built on popular open source tools that many data scientists already use, so the learning curve is short.

For the composite organization, Forrester assumes that:

- The organization uses professional services to help with the implementation, paying $100,000 for those services before go-live.
- The organization spends two months on initial incremental time to build the first models.
- The organization estimates that new hires spend three days on both formal and on-the-job training.

Risks that affect these cost estimates include:

- Implementation and training costs will vary significantly based on the skill level in the prior environment.

To account for these risks, Forrester adjusted this cost upward by 15%, yielding a three-year risk-adjusted total PV of $518,000.

Two months:
Initial incremental time to build first models

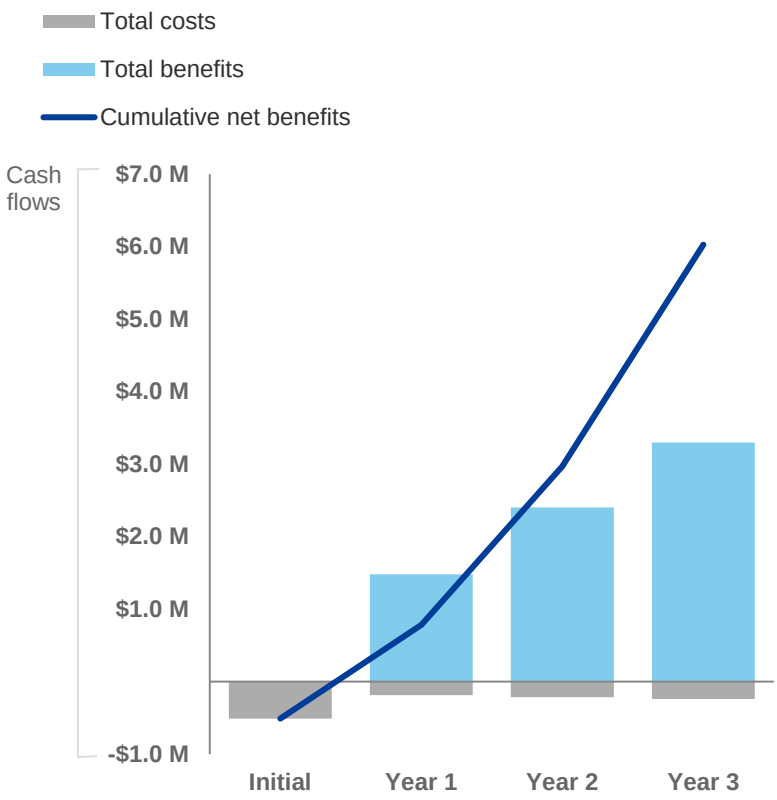
Implementation And Training: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
G1	Implementation cost, professional services	Interview/survey	$100,000			
G2	Additional time to build initial models (days)	Two months	47			
G3	Training days for new users	Interview/survey	3			
G4	Number of new users	Assumption	10	0	2	2
G5	Average daily data scientist fully loaded compensation	$180,000/260	$692	$692	$692	$692
Gt	Implementation and training	G1+((G2+G3)* G4*G5)	$446,154	$0	$4,154	$4,154
	Risk adjustment	↑15%				
Gtr	Implementation and training (risk-adjusted)		$510,423	$0	$4,777	$4,777

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 Table (Risk-Adjusted)

	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Total costs	($510,423)	($187,000)	($215,977)	($240,177)	($1,153,577)	($1,039,365)
Total benefits	$0	$1,479,275	$2,403,625	$3,298,406	$7,181,306	$5,809,405
Net benefits	($510,423)	$1,292,275	$2,187,648	$3,058,229	$6,027,729	$4,770,040
ROI						459%
Payback period						<6 months

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IBM Watson Studio And Watson Knowledge Catalog: Overview

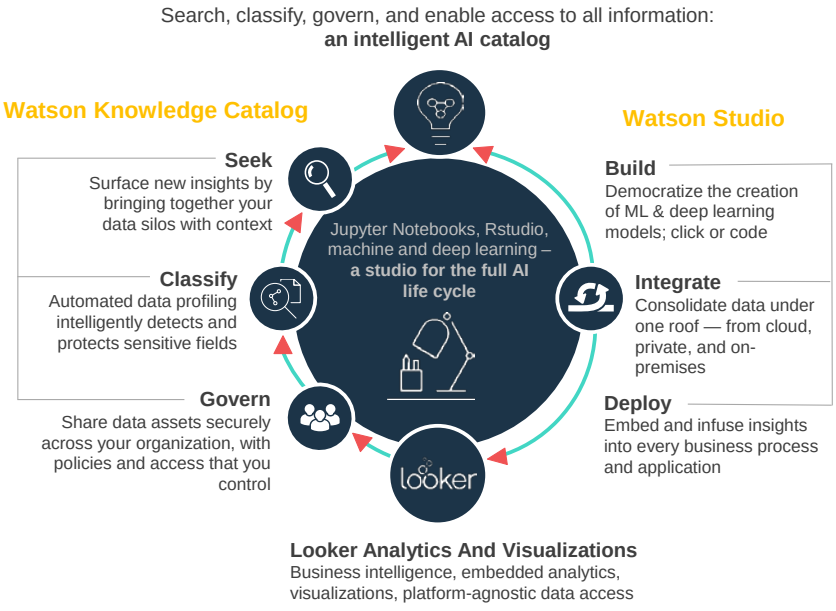
The following information is provided by IBM. Forrester has not validated any claims and does not endorse IBM or its offerings.

IBM Watson® Studio is an integrated platform on IBM Cloud that supports complete data analytics and AI life cycle required to infuse AI into your business. Built with best of open source and IBM products, it provides a suite of tools for data scientists, application developers, and subject matter experts to collaboratively and easily work with data and use that data to build, train, and deploy machine learning models at scale.

IBM Watson® Knowledge Catalog, is an intelligent cataloging service that knowledge workers, including data scientists, can use to index all the available knowledge assets in their business, on-premises or on cloud. This includes open and third-party data, as well as dashboards, data and machine learning models, connections, notebooks, and more, to activate them for analytics, machine learning, and deep learning.

Integrated platform for data analytics and AI workflow

Watson Studio and Watson Knowledge Catalog



Machine and deep learning:

› Craft models and compare results

› Run experiments backed by automated life cycle management

› Direct integration with **Watson Machine Learning** for the latest in deep learning techniques

Open source technologies:

› Powered by Jupyter **Notebooks** and Apache Spark. Supports your favorite languages and tools: Python, Scala, and R.

Easy visualizations:

› Design and train machine learning models without a single line of code.

› **Visual modeling tools** allow you to quickly identify patterns, gain insights, and make decisions faster.

All-in-one experience:

› **Collaborate** across teams by bringing together data and talent under one roof

› Deploy your models directly to the web with application-friendly APIs

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Appendix A: Total Economic Impact

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

Total Economic Impact Approach

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

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

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

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

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

Present value (PV)

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

Net present value (NPV)

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

Return on investment (ROI)

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

Discount rate

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

Payback period

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