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Prepared for InnoCentive

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The Total Economic Impact™ Of InnoCentive Challenges Single Company Case Study

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Executive Summary

In January 2009, InnoCentive commissioned Forrester Consulting to examine the total economic impact and potential return on investment (ROI) enterprises may realize by deploying InnoCentive Challenges. InnoCentive Challenges is an innovation solution that gives users access to InnoCentive's Web community of experts. In this solution, the users (also known as "Seekers") post a unique problem, called an InnoCentive Challenge, to the community in InnoCentive's Open Innovation Marketplace (collectively referred to as "Solvers"). The goal of an InnoCentive Challenge is to solicit solutions from the Solver community and ultimately choose the one that best fits the criteria set out by the Seeker. Challenges can be large or small, short-term or long-term. If a solution is selected as "best" by the Seeker, the Solver receives a financial award, which varies per Challenge.

This study illustrates the financial impact of using InnoCentive Challenges for open innovation in the research and development department of a large consumer products organization.

The organization interviewed as the basis for this case study is a leading consumer products company in Europe, but the group also holds strong positions in North America, Latin America, Asia, and Australasia. The organization has over 50,000 employees and over €10 billion in annual sales. InnoCentive Challenges was implemented in the Personal Care division, one of the four major divisions of the company.

Within the organization, the research and development department of the Personal Care division used the InnoCentive Challenges solution to enhance its own open innovation program. The division is also currently investigating expanding use of InnoCentive Challenges to other departments, such as marketing, within the division.

In conducting in-depth interviews with this existing customer, Forrester found that the organization achieved:

- Cost savings.
- Resource savings from a faster research process through open innovation.
- Access to a diverse network of experts.
- Fostering a more innovative research culture.
- Improved ability to frame research problems in all areas of R&D.
- Smoother IP transfer process.

Forrester calculated that the organization achieved a return on investment (ROI) of 74%, with a payback period of less than three months from the benefits quantified in the study.

In addition, Forrester believes that there are benefits associated with using InnoCentive Challenges that are extremely difficult to quantify. For example, as some solutions to client Challenges are integrated into a company's R&D process, they may contribute to significant commercial product successes and help these products go to market faster. Due to the vast amount of elements that may contribute to these commercial successes (such as the company's development process or

marketing capabilities), we have not quantified them in this case study. Nonetheless, we believe they represent significant benefit of using InnoCentive Challenges.

Purpose

The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of InnoCentive Challenges on their organizations. Forrester's aim is to clearly show all calculations and assumptions used in the analysis. Readers should use this study to better understand and communicate a business case for investing in InnoCentive Challenges.

Methodology

InnoCentive selected Forrester for this project because of its industry expertise in enterprise innovation and Forrester's Total Economic Impact™ (TEI) methodology. TEI not only measures costs and cost reduction (areas that are typically accounted for within IT) but also weighs the enabling value of a technology in increasing the effectiveness of overall business processes.

For this study, Forrester employed four fundamental elements of TEI in modeling InnoCentive Challenges:

1. Costs and cost reduction.
2. Benefits to the entire organization.
3. Flexibility.
4. Risk.

Given the increasing sophistication that enterprises have regarding cost analyses related to IT investments, Forrester's TEI methodology serves an extremely useful purpose by providing a complete picture of the total economic impact of purchase decisions. Please see Appendix B for additional information on the TEI methodology.

Approach

Forrester used a five-step approach for this study:

1. Forrester gathered data from existing Forrester research relative to InnoCentive Challenges and the Web innovation market in general.
2. Forrester interviewed InnoCentive marketing and sales personnel to fully understand the potential (or intended) value proposition of InnoCentive Challenges.
3. Forrester conducted a series of in-depth interviews with an organization which was currently using the InnoCentive Challenges solution.
4. Forrester constructed a financial model representative of the interviews. This model can be found in the TEI Framework section below.

Key Findings

Forrester's study yielded the following key findings:

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- ROI.** Based on the interviews with the organization, Forrester constructed a TEI framework for the organization and the associated ROI analysis to illustrate the areas of financial impact. As seen in Table 1, the ROI for the organization is 74% with a payback period of less than three months.
- Benefits.** The main quantified benefits for the organization were: 1) the lower cost associated with tapping a global network of experts through the InnoCentive Challenges program compared with using additional internal resources to replicate the investigation; 2) cost avoidance of pursuing open innovation through outside consultants for a percentage of the problems sent to InnoCentive Challenges; and 3) lower cost associated with using InnoCentive Challenges as compared with the costs of investigating a percentage of the problems through university channels. Forrester conservatively estimates the value of these benefits at \$1,298,955 (risk-adjusted, present value) over three years. Other benefits not quantified included fostering a more innovative research culture, improved ability to frame research Challenges, and outsourcing the IP transfer process.
- Costs.** The costs of implementing InnoCentive Challenges include: 1) the fee for the InnoCentive starter package, which includes consulting and training services for establishing best practices for open innovation around InnoCentive Challenges; 2) the fees for posting a Challenge; 3) internal resources spent on designing and posting Challenges as well as evaluating the results of a Challenge; 4) fees paid for a successful Challenge, which includes fees to the Solvers as well as fees to InnoCentive for any IP transfer processing required; and 5) administrative costs. Forrester estimates the total of these costs at \$744,993 (risk-adjusted, present value) over three years, with InnoCentive Challenge posting fees being the main component.

Table 1 illustrates the risk-adjusted cash flow for the organization, based on data and characteristics obtained during the interview process. Forrester risk-adjusts these values to take into account the potential uncertainty that exists in estimating the costs and benefits of a technology investment. The risk-adjusted value is meant to provide a conservative estimation, incorporating any potential risk factors that may later affect the original cost and benefit estimates. For a more in-depth explanation of risk and risk adjustments used in this study, please see the “Risk” section.

Table 1: ROI, Risk-Adjusted

Ref.	Project cash flow	Calculation	Initial	Year 1	Year 2	Year 3	Total	PV/NPV
H1	Total costs		(\$50,000)	(\$301,070)	(\$258,337)	(\$276,570)	(\$885,977)	(\$744,993)
L1	Total benefits		\$0	\$542,355	\$482,094	\$542,355	\$1,566,805	\$1,298,955
P1	Net savings		(\$50,000)	\$241,285	\$223,757	\$265,785	\$680,828	\$553,962
P2	Return on investment	(L1-H1)/H1						74%
P3	Payback period		2.5 months					

Source: Forrester Research, Inc.

Disclosures

The reader should be aware of the following:

- The study is commissioned by InnoCentive and delivered by the Forrester Consulting group.
- InnoCentive 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.
- The customer names for the interviews were provided by InnoCentive.
- Forrester makes no assumptions as to the potential return on investment that other organizations will receive. Forrester strongly advises that readers should use their own estimates within the framework provided in the report to determine the appropriateness of an investment in InnoCentive Challenges.
- This study is not meant to be used as a competitive product analysis.

InnoCentive Challenges: Overview

According to InnoCentive, an InnoCentive Challenge is a unique problem posted by Seekers in InnoCentive's Web-based Open Innovation Marketplace. The goal of the Challenge is to solicit solutions from the Solver community and ultimately choose the one that best fits the criteria set out by the Seeker. If a solution is selected as "best" by the Seeker, the Solver receives a financial award, which varies per Challenge. Challenges can be large or small, short-term or long-term.

To meet the full range of solution requirements, InnoCentive offers four Challenge types.

InnoCentive Ideation Challenge: a global brainstorm for producing a breakthrough idea. This could include ideas for a new product line, a new commercial application for a current product, or even a viral marketing idea for recruiting new customers.

Theoretical Challenge: a design that implements an idea but is not yet a proof of concept. A solution to a Theoretical Challenge will solidify the Solver's concept with detailed descriptions, specifications, and requirements necessary to bringing a good idea closer to becoming an actual product or service.

RTP Challenge: a prototype that proves an idea. Once an organization has a theory or design for a product or service, an RTP Challenge requests that Solvers prove their solution will work within the organization's specific needs, decision criteria, and manufacturing parameters.

eRFP Challenge: a request for a partner or supplier to provide materials or expertise to help solve a business Challenge. Organizations can use the InnoCentive network to find businesses or consultants that have already developed the technology they need or have the experience to help organizations develop it themselves.

InnoCentive's team of scientists, Ph.D.s, and consultants work with the Seeker throughout the entire process to ensure the Seeker maximizes a Challenge's potential.

Analysis

As stated in the Executive Summary, Forrester took a multistep approach to evaluate the impact that implementing InnoCentive Challenges can have on an organization:

- Interviews with InnoCentive executive, marketing, sales, and service delivery personnel.
- Review and analysis by a Forrester analyst whose focus includes enterprise innovation.
- In-depth interviews with an enterprise client currently using InnoCentive Challenges.
- Construction of a common financial framework for the implementation of InnoCentive Challenges.

Interview Highlights

The organization interviewed is a global consumer goods and paper company. With headquarters in Europe, the company has a strong presence there as well as in North America, Latin America, Asia, and Australasia. The organization seeks to increase the percentage of value-added products, and the products consist almost exclusively of renewable and recyclable materials.

The organization comprises four business areas also known as divisions. The research and development department of the Personal Care division used the InnoCentive Challenges solution to enhance its own open innovation program. The organization is also currently investigating expanding the use of InnoCentive Challenges to other departments within Personal Care.

The in-depth interviews with the organization revealed that:

- The Personal Care division has a culture that is open to “trying out new ways of working.” The organization had already identified external collaboration as an important factor in driving innovation in its division’s research and development process. For a number of years, they have cultivated relationships with universities, institutes, and other research organizations to collaborate on projects. The organization encourages its scientists to work externally, even “expects them to work this way.”
- The organization sees external collaboration as a means to secure the competitive positions of its global brands. Research and development is not centralized across the organization and is independently run in each division. “In our way of working, we realized that we have a limited amount of internal resources. It’s only natural that we go outside the company,” states the research manager for one of the competency groups within the research and development department of Personal Care.
- With the development of venues for collaboration through the Internet, it was a “strategic decision” within the research and development department of the organization’s Personal Care division to explore the Web-based capabilities available to them.
- At the time of the decision, the open innovation market was in its infancy and the organization’s innovation manager led the team to evaluate players in the field based on the capability to deliver solutions, not just contacts. From this process, the organization chose InnoCentive Challenges.

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- The organization viewed its initial partnership with InnoCentive as “taking a calculated risk,” since at the start of the project, it could not tell what percentage of the Challenges it posed would yield successful results. By viewing the funding for the project as “risk money” and the initial rollout as a learning process for open innovation through the Web, the organization was freed up to try this new method of working with minimal risk of failure. This encouraged the organization’s scientists in its research department to propose problems for Challenges and to fully participate in the open innovation program.
- The organization initially entered into a one-year contract with InnoCentive and used InnoCentive Challenges for very specific technical problems within the research department. These were in areas that the organization did not have competency in or projects that needed more resources that were not available at the time. After the first year, the organization decided to roll out the program to other areas of the Personal Care organization.
- The organization noted the importance of the guidance provided by InnoCentive’s Innovation Program Manager. Training would ensure a faster roll-out of the program of using open innovation on the Web. This training would include best practices to incorporate InnoCentive Challenges within an organization’s processes. According to the organization, changing organizational processes and culture requires more communication and consistent practice.
- Successful Challenges ranged from discovering a method for measuring specific parameters for absorbency to putting out an eRFP (electronic request for partnership) through InnoCentive’s Open Innovation Marketplace. The organization noted that in the former case, it did not have expertise in the area and the result of the Challenge was “a unique solution that we would never have come up with ourselves.” In the latter case, the organization recognized that with access to the InnoCentive network for possible partners, it was able to get double the amount of work done in the same amount of time.

TEI Framework

Introduction

From the information provided in the in-depth interviews, Forrester has constructed a TEI framework for those organizations considering implementation of InnoCentive Challenges. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that influence the investment decision.

Framework Assumptions

Table 2 lists the discount rate used in the PV and NPV calculations and time horizon used for the financial modeling.

Table 2: General Assumptions

Ref.	General assumptions	Value
	Discount rate	10%
	Length of analysis	Three years

Source: Forrester Research, Inc.

Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult with their finance department to determine the most appropriate discount rate to use within their own organizations.

In addition to the financial assumptions used to construct the cash flow analysis, Table 3 provides fully-loaded compensation (salary plus benefits) assumptions used within this analysis.

Table 3: Salary Assumptions

Ref.	Metric	Calculation	Value
A1	Hourly Compensation Per Scientist		\$67

Source: Forrester Research, Inc.

Costs

The key cost categories associated with InnoCentive Challenges are: 1) the fee for the InnoCentive startup consulting and training services; 2) the fees for posting a Challenge; 3) internal resources spent on posting Challenges and evaluating Challenge results; 4) fees paid for a successful Challenge, which includes fees to the Solvers as well as fees to InnoCentive for any IP work; and 5) administrative costs.

The project is measured on a three-year basis. The following are the cost inputs to the financial analysis.

InnoCentive Challenges Startup Consulting And Training Services

The organization noted that it takes some time to change entrenched ways of working. Open innovation through InnoCentive typically involves “new processes and new people.” InnoCentive offers consulting and training services as part of an InnoCentive Challenges engagement. This starter package includes training around best practices for open innovation, needs assessment that includes evaluating compensation and incentives, development of a marketing plan, and other consulting services. The average price for startup consulting and training services is \$50,000. InnoCentive also offers different pricing for a starter package that includes a set of Challenges.

Challenge Posting Fees

Fees for Challenge posting vary per customer, depending on the number of Challenges. Forrester uses the average Challenge fee of \$15,000 per Challenge. The three-year analysis estimates that the organization posted nine, eight, and nine Challenges in years 1, 2, and 3, respectively. The cost to post these Challenges within the organization totals \$390,000.

Successful Challenge Fees

The organization worked closely with InnoCentive’s Innovation Program Manager to structure the Challenge and the award offered for a successful Challenge. The award amount depends on the nature of the Challenge and the solution offered. The organization estimates that the average award the organization gave for a successful Challenge is \$18,000. In addition to the award, InnoCentive charges a finder’s fee for each successful Challenge. This finder’s fee covers the work that InnoCentive undertakes on behalf of its customers to transfer IP rights for successful Challenges. The organization estimates that on average, it has paid out \$6,500 per successful Challenge in finder’s fees.

The organization reported a 50% success rate for Challenges posted on InnoCentive’s Open Innovation Marketplace. For Forrester’s three-year analysis of 26 Challenges, this translates to 13 successful Challenges. As each successful Challenge costs \$24,500 in fees (award plus finder’s fee), the cost of successful Challenge awards and fees totaled \$318,500 over three years.

Internal Labor Costs

The organization incurs costs on effort by its internal resources to screen candidates for the InnoCentive Challenges program and to formulate the Challenges that are ultimately posted. Time and effort is also spent by the organization scientists in evaluating the solutions posted by InnoCentive’s network of experts.

The organization categorizes the RTP, Theoretical, and Ideation Challenges it has posted as large, medium, and small, respectively. The organization estimates that large Challenges require 40 hours of formulation time with 10 hours of evaluation time per answer. With answers averaging at three for large Challenges, the total estimated hours spent per large Challenge is 70 hours. For medium Challenges, the organization estimates 20 hours of formulation time with 3 hours of evaluation time per answer. With answers averaging at eight for medium Challenges, the total estimated hours spent per medium Challenge is 44 hours. For small Challenges, the organization estimates 5 hours of formulation time with 1 hour of evaluation time per answer. With answers averaging at 40 for small Challenges, the total estimated hours spent per small Challenge is 45 hours.

The organization also estimates that the percentage of large, medium, and small Challenges that it has posted through InnoCentive number 10%, 65%, and 25%, respectively. At a fully burdened hourly compensation of \$67 per hour, this translates into an internal labor cost of \$81,613 over three years.

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Table 4: Internal Labor Costs — Challenge Posting And Evaluation

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3	Total
A1	Hourly rate per person		\$67				
A2	Hours per small Challenge		45				
A3	Percentage of Challenges		25%				
A4	Hours per medium Challenge		44				
A5	Percentage of Challenges		65%				
A6	Hours per large Challenge		70				
A7	Percentage of Challenges		10%				
A8	No. of Challenges			9	8	9	
At	Internal labor costs — Challenge posting and evaluation	$A1 * A8 * ((A2 * A3) + (A4 * A5) + (A6 * A7))$		28,251	25,112	28,251	
Ato	Total (original)			(\$28,251)	(\$25,112)	(\$28,251)	(\$81,613)

Source: Forrester Research, Inc.

Administrative Costs

The organization estimates that one full-time equivalent (FTE) spends 10% per year on general account maintenance and administration of the InnoCentive relationship and the InnoCentive Challenges program. This internal effort is also supplemented by 40 hours of work by other members within the Personal Care research department. At a fully burdened hourly compensation of \$67, this translates to administrative costs of \$14,472 per year.

Total Costs

Table 5 summarizes all costs associated with the organization's implementation of InnoCentive Challenges.

Table 5: Total Costs

Costs	Initial	Year 1	Year 2	Year 3	Total
InnoCentive startup consulting and training services	(50,000)				(50,000)
Challenge posting fees		(135,000)	(120,000)	(135,000)	(390,000)
Internal labor costs — Challenge posting and evaluation		(28,251)	(25,112)	(28,251)	(81,613)
Successful Challenge fees		(122,500)	(98,000)	(98,000)	(318,500)
Administrative costs		(14,472)	(14,472)	(14,472)	(43,416)
Total	(\$50,000)	(\$300,223)	(\$257,584)	(\$275,723)	(\$883,529)

Source: Forrester Research, Inc.

Benefits

According to the organization, the main benefit of using InnoCentive Challenges has been to gain access to a diverse network of experts resulting in a faster research process at a lower cost than the alternative of using additional internal resources to explore solutions or going to an outside consultant or university institution to find external collaborators.

“We work on projects with different alternatives. For example, we have three alternatives, and sometimes we have resources to only explore two. Working with InnoCentive has given us the opportunity to work on all three.” - Research Manager, Bio Science, Personal Care Division

Cost Savings — Internal Resources

The organization uses InnoCentive Challenges to work on parts of large research projects. These parts could range from very specific questions to a certain research area within the project to sourcing a supplier for project components. The organization posts Challenges to get access to the competence it needs for parts of a project that is in a new area of research for the organization

Without InnoCentive, the organization's research and development department would have had to essentially start up the process of acquiring this competence — either through hiring, requisitioning more internal resources from other parts of the organization, or requiring its scientists to work more hours. The organization noted that this alternative scenario of going to internal resources would be applicable to 80% of the problems it posted on InnoCentive Challenges.

The organization estimates that, for large Challenges, the internal effort exploring and replicating the results would have cost the organization three scientists working five months. At 147 hours per month, alternative internal effort for a large Challenge is 2,205 hours. For medium Challenges, the organization estimates this alternative internal effort at two scientists working for three months, or 882 hours. For small Challenges, the organization estimates internal effort at one scientist working for one month, equivalent to 147 hours.

The organization characterizes the percentage of large, medium, and small Challenges at 10%, 65%, and 25%, respectively.

At a fully burdened compensation of \$67 per hour for a scientist, the total savings from using InnoCentive Challenges instead of internal resources saved the organization \$1,157,454 over three years.

Table 6: Cost Avoidance — Internal Resources

Ref.	Metric	Calculation	Year 1	Year 2	Year 3	Total
A1	Hours per small Challenge		147			
A2	Percentage of total Challenges		25%			
A3	Hours per medium Challenge		882			
A4	Percentage of total Challenges		65%			
A5	Hours per large Challenge		2,205			
A6	Percentage of total		10%			

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	Challenges					
A7	No. of Challenges (80%)		7	6	7	
A8	Hourly rate per person		\$67			
At	Cost avoidance — internal resources	$((A1*A2)+(A3*A4)+(A5*A6))*A7*A8$	400,657	356,140	400,657	
Ato	Total (original)		\$400,657	\$356,140	\$400,657	\$1,157,454

Source: Forrester Research, Inc.

Access To Network — Cost Avoidance Of Outside Consultants

The organization estimates that without the access to a network of experts through InnoCentive Challenges, the organization would have gone to outside consultants for 10% of the problems posted as a Challenge. Average fees for working with outside consultants are estimated at \$50,000 per engagement cost and \$5,000 in travel fees. The organization also estimates that it would have spent 90 hours of internal resources time working with these consultants.

By using InnoCentive Challenges, the organization has avoided a total cost of \$158,678 for outside consultants.

Table 7: Access To Network — Outside Consultants

Ref.	Metric	Calculation	Year 1	Year 2	Year 3	Total
A1	Hourly rate per person		\$67			
A2	Number of hours		90			
A3	Cost for outside consultant		\$50,000			
A4	Travel costs		\$5,000			
A5	No. of Challenges		9	8	9	
A6	Percentage of projects that would have used outside consultants		10%			
At	Access to network — cost avoidance of outside consultants	$((A1*A2)+(A3+A4))*A5*A6$	54,927	48,824	54,927	
Ato	Total (original)		\$54,927	\$48,824	\$54,927	\$158,678

Source: Forrester Research, Inc.

Access To Network — Cost Avoidance Of University Grants

The organization estimates that without the access to a network of experts through InnoCentive Challenges, the organization would have gone to institutions such as universities and other large research institutes for 10% of the problems posted as Challenge. This collaboration would have taken the form of awarding research grants to explore a particular problem or field.

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The organization estimates the average costs of working with a university or research institute at \$100,000 with an additional \$5,000 in travel fees. The organization also estimates that it would have spent 150 hours of its internal resources working with the institutions to establish and structure these grants as well as coordinate any transfer of patent rights resulting from the research.

By using InnoCentive Challenges, the organization has avoided a total cost of \$299,130 for the alternative of using university grants over a three-year analysis.

Table 8: Access To Network — University Grants

Ref.	Metric	Calculation	Year 1	Year 2	Year 3	Total
A1	Hourly rate per person		\$67			
A2	Number of hours		150			
A3	Cost for universities		\$100,000			
A4	Travel costs		\$5,000			
A5	No. of Challenges		9	8	9	
A6	Percentage of projects that would have used outside consultants		10%			
At	Access to network — cost avoidance of university grants	$((A1*A2)+A3+A4)*A5*A6$	103,545	92,040	103,545	
Ato	Total (original)		\$103,545	\$92,040	\$103,545	\$299,130

Source: Forrester Research, Inc.

Total Benefits

The organization's expected total quantified benefits from InnoCentive Challenges are summarized in the table below.

Table 9: Total Benefits

Benefits	Initial	Year 1	Year 2	Year 3	Total
Cost avoidance — internal resources		400,657	356,140	400,657	1,157,454
Access to network — cost avoidance of outside consultants		54,927	48,824	54,927	158,678
Access to network — cost avoidance of university grants		103,545	92,040	103,545	299,130
Total		\$559,129	\$497,004	\$559,129	\$1,615,262

Source: Forrester Research, Inc.

Additional Benefits Not Quantified

“InnoCentive has given us new tools and new ways of working. It is stimulating for a scientist to work this way.” – Research Manager, Bio Science, Personal Care Division

The organization identified the following benefits of using InnoCentive Challenges but was not able to quantify these benefits at this time.

Fostering A More Innovative Culture

The organization saw the InnoCentive Challenges program as another way to encourage a more innovative culture within the organization. Working with InnoCentive is stimulating for the organization's scientists, as they gain access to new tools for open innovation. Having a part of their project chosen as an InnoCentive Challenge is also seen as an advantage, as it subjects their projects to peer review. A successful Challenge gives the scientists the benefit of knowing that they were able to define and formulate their project problems to a global network of peers. On the other hand, a Challenge that has no suitable answer gives the scientists the satisfaction of knowing they exhausted all avenues in their research.

Improved Ability To Frame Research Challenges

InnoCentive scientists worked closely with the organization scientists through workshops to train the organization to identify and formulate Challenges. The organization stated that through the process of working with InnoCentive, the organization scientists have improved their ability to frame research Challenges. The organization noted, “InnoCentive has a good way of working here. We are getting better at problem definition, which we can use both internally and externally. We learn a methodology we can use with other parts of our work.” By developing the skills of framing specific research questions through the InnoCentive Challenges program, scientists are then able to bring these skills to other parts of their work in the research and development process, which ultimately enables the organization to get results faster.

Smoother IP Transfer Process

The organization also noted that working with InnoCentive Challenges brings the benefit of a smoother IP transfer process. The organization no longer has to spend time and effort on the legal processes of regulating and transferring IP rights for a solution. This would have added more time to the research process if the organization had to collaborate externally without InnoCentive. There are also savings associated with IP lawyers' fees that the organization has avoided by going through InnoCentive. While not quantified in this study, readers can choose to apply their own costs for internal labor and lawyer fees, when calculating the benefit of a smoother IP transfer process.

Risk

Risk is the third component within the TEI model; it is used as a filter to capture the uncertainty surrounding different cost and benefit estimates. If a risk-adjusted ROI still demonstrates a compelling business case, it raises confidence that the investment is likely to succeed because the risks that threaten the project have been taken into consideration and quantified. The risk-adjusted numbers should be taken as “realistic” expectations, since they represent the expected values considering risk. In general, risks affect costs by raising the original estimates, and they affect benefits by reducing the original estimates.

For the purpose of this analysis, Forrester risk-adjusts cost and benefit estimates to better reflect the level of uncertainty that exists for each estimate. The TEI model uses a triangular distribution method to calculate risk-adjusted values. To construct the distribution, it is necessary to first

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estimate the low, most likely, and high values that could occur within the current environment. The risk-adjusted value is the mean of the distribution of those points.

For example, take the case of internal labor costs for Challenge posting and evaluation. The \$81,668 value used in this analysis can be considered the “most likely” or expected value. Internal labor costs may vary based on the nature of the Challenge. This variability represents a risk that must be captured as part of this study. Forrester uses a risk factor of 110% on the high end, 100% as the most likely, and 100% on the low end. This has the effect of increasing the cost estimate to take into account the fact that original cost estimates are more likely to be revised upward than downward. Forrester then creates a triangular distribution to reflect the range of expected costs, with 103% as the mean (103% is equal to the sum of 110%, 100%, and 100% divided by three). Forrester applies this mean to the most likely estimate, \$81,668, to arrive at a risk-adjusted value of \$84,118.

Risk adjustments for benefits reduce the original benefits estimates. For example, Forrester applies a risk range of 90% on the low end of the estimate and 100% on the most-likely and high end for cost savings from the alternative of using internal resources. This has the effect of reducing the benefit estimate by 3%, equal to 97% of the original value.

The following risks were considered in this study:

- **Implementation risks.** Internal labor costs required to post and evaluate Challenges may vary according to the different types of Challenges involved.
- **Variability in labor savings.** This is due to the variability in internal resources needed to investigate and resolve different Challenges.
- **Variability in cost avoidance for outside experts.** This is due to the requirements of the different Challenges for the outside resource used.

The following tables show the values used to adjust for uncertainty in cost and benefit estimates. Different cost and benefit estimates have different levels of risk adjustments depending on variability and other factors. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

Table 10: Risk Factors — Costs

Costs	Original estimate	Low	High	Mean
InnoCentive starter pack — consulting and training services	100%	100%	100%	100%
Challenge posting fees	100%	100%	100%	100%
Internal labor costs — Challenge posting and evaluation	100%	100%	110%	103%
Successful Challenge fees	100%	100%	100%	100%
Administrative costs	100%	100%	100%	100%

Source: Forrester Research, Inc.

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Table 11: Risk Factors — Benefits

Benefits	Original estimate	Low	High	Mean
Cost avoidance — internal resources	100%	90%	100%	97%
Access to network — cost avoidance of outside consultants	100%	90%	100%	97%
Access to network — cost avoidance of university grants	100%	90%	100%	97%

Source: Forrester Research, Inc.

The risk factors in Tables 10 and 11 are applied to the benefits and costs listed earlier, resulting in the risk-adjusted cost and benefit values in Tables 12 and 13:

Table 12: Total Costs — Risk-Adjusted

Cost	Step 1:	Low	High	Step 2:	
	Original estimate			Risk adjustment %	value
InnoCentive starter pack — consulting and training services	\$50,000	\$50,000	\$50,000	100%	\$50,000
Challenge posting fees	\$390,000	\$390,000	\$390,000	100%	\$390,000
Internal labor costs — Challenge posting and evaluation	\$81,613	\$81,613	\$89,774	103%	\$84,061
Successful Challenge fees	\$318,500	\$318,500	\$318,500	100%	\$318,500
Administrative costs	\$43,416	\$43,416	\$43,416	100%	\$43,416

Source: Forrester Research, Inc.

Table 13: Total Benefits — Risk-Adjusted

Benefit	Step 1:	Low	High	Step 2:	
	Original estimate			Risk-adjustment %	value
Cost avoidance — internal resources	\$1,157,454	\$1,041,709	\$1,157,454	97%	\$1,122,731
Access to network — cost avoidance of outside consultants	\$158,678	\$142,810	\$158,678	97%	\$153,918
Access to network — cost avoidance of university grants	\$299,130	\$269,217	\$299,130	97%	\$290,156

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

Forrester identified the following areas that present flexibility options for the organization through InnoCentive Challenges:

- As the organization expands the application of InnoCentive Challenges to other areas apart from research and development in the Personal Care division, the organization has the opportunity to see cost savings and a faster development process for projects in marketing, procurement, etc.

The analysis conservatively uses the benefits and cost figures from medium Challenges, which make up 65% of the InnoCentive Challenges for the organization, for flexibility calculations. The benefit of avoiding the cost of internal resources for medium Challenges is 882 hours multiplied by \$67 per FTE hour or \$59,094 benefit per Challenge. The cost includes the Challenge posting fees of \$15,000, the internal labor cost of a medium Challenge at 44 hours or \$2,948 per Challenge and the successful Challenge fees using the 50% success rate of the organization.

The flexibility analysis assumes that expansion of the InnoCentive Challenges program to other areas in the division will conservatively result in 20 more Challenges over two years. The total benefit value of these 20 Challenges is \$1,181,880. The total cost to implement these 20 Challenges is \$604,000.

The flexibility component of TEI captures that value using either the financial industry standard Black-Scholes or the binomial option pricing models. With a two-year time frame to use this option, Forrester values the above flexibility option at \$684,027. This value exists in addition to risk-adjusted benefits and ROI described in this analysis.

Table 14: Flexibility Analysis: Expansion Of Challenges Program

Ref.	Metric	Calculation	Per Period
A1	Asset value (benefit — cost avoidance of internal labor)		\$1,181,880
A2	Cost to acquire (labor, posting fees and successful award fees)		\$603,960
A3	Expiration (time to expire, in years)		2.0
At	Flexibility	Black-Scholes Model	\$684,027

Source: Forrester Research, Inc.

The value of flexibility is unique to each organization, and the willingness to measure its value varies from company to company (see Appendix A for additional information regarding the flexibility calculation). Please note that the values calculated above exist in addition to risk-adjusted benefits described in this case study analysis; Forrester has not included the option value in the ROI calculations.

TEI Framework: Summary

Considering the financial framework constructed above, the results of the costs, benefits, risk, and flexibility sections using the representative numbers can be used to determine a return on investment, net present value, and payback period. Table 14 shows the consolidation of the numbers for the organization.

Table 15: Total Costs And Benefits, Non-Risk-Adjusted

Ref.	Project cash flow	Calculation	Initial cost	Year 1	Year 2	Year 3	Total	PV/NPV
H1	Total costs		(\$50,000)	(\$300,223)	(\$257,584)	(\$275,723)	(\$883,529)	(\$742,963)
J1	Total benefits		\$0	\$559,129	\$497,004	\$559,129	\$1,615,262	\$1,339,128
K1	Net savings			\$258,907	\$239,420	\$283,407	\$731,734	\$596,165
L1	ROI	(J1-H1)/H1						80%

Source: Forrester Research, Inc.

Table 16 shows the risk-adjusted values, applying the risk-adjustment method indicated in the risks section.

Table 16: Total Costs And Benefits, Risk-Adjusted

Ref.	Project cash flow	Calculation	Initial cost	Year 1	Year 2	Year 3	Total	PV/NPV
E1	Total costs		(\$50,000)	(\$301,070)	(\$258,337)	(\$276,570)	(\$885,977)	(\$744,993)
F1	Total benefits		\$0	\$542,355	\$482,094	\$542,355	\$1,566,805	\$1,298,955
G1	Net savings			\$241,285	\$223,757	\$265,785	\$680,828	\$553,962
H1	ROI	(F1-E1)/E1						74%

Source: Forrester Research, Inc.

It is important to note that values used throughout the TEI Framework are based on in-depth interviews with a current InnoCentive Challenges customer by Forrester. Forrester makes no assumptions about the potential return other organizations might realize within their respective environments. Forrester strongly advises that readers use their own estimates within the framework provided in this study to determine the expected financial impact of implementing InnoCentive Challenges.

Study Conclusions

Forrester's in-depth interviews with an InnoCentive Challenges customer yielded several important observations:

- Based on information collected in interviews with current Challenges customers, Forrester found that organizations can realize benefits in the form of achieving a faster research process at a lower cost than the alternative of using additional internal resources to explore solutions or going to an outside consultant or university institution to gain access to experts.
- Other benefits not quantified include fostering a more innovative culture within the organization, improved ability to frame research Challenges, and an easier process of transferring IP rights.
- The organization also noted instances wherein results from the InnoCentive Challenges were “unique solutions that we would have never come up with ourselves.” With open innovation through InnoCentive Challenges, the organization gains access to expertise and competence in new areas made available through InnoCentive’s global network.

The financial analysis provided in this study illustrates the potential way an organization can evaluate the value proposition of InnoCentive Challenges. Based on information collected in in-depth customer interviews, Forrester calculated a three-year, risk-adjusted ROI of 74% for the organization with a payback period of less than three months. All final estimates are risk-adjusted to incorporate potential uncertainty in the calculation of costs and benefits.

In addition, Forrester believes that there are benefits associated with using InnoCentive Challenges that are extremely difficult to quantify. For example, as some solutions to client Challenges are integrated into a company's R&D process, they may contribute to significant commercial product successes. Due to the vast amount of elements that may contribute to these commercial successes (such as the company's development process or marketing capabilities), we have not quantified them in this case study. Nonetheless, we believe they represent significant benefit of using InnoCentive Challenges.

Based on these findings, companies looking to implement InnoCentive Challenges can see cost savings and greater access to a network of experts. Using the TEI framework, many companies may find the potential for a compelling business case to make such an investment.

Table 17: ROI, Original And Risk-Adjusted

Summary financial results	Original estimate	Risk-adjusted
ROI	80%	74%
Payback period (months)	2.3 months	2.5 months
Total costs (PV)	(\$742,963)	(\$744,993)
Total benefits (PV)	\$1,339,128	\$1,298,955
Total (NPV)	\$596,165	\$553,962

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.

The TEI methodology consists of four components to evaluate investment value: benefits, costs, risks, and flexibility. For the purpose of this analysis, the impact of flexibility was not quantified.

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 forms 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.

Risk

Risk measures the uncertainty of benefit and cost estimates contained within the investment. Uncertainty is measured in two ways: the likelihood that the cost and benefit estimates will meet the original projections and the likelihood that the estimates will be measured and tracked over time. TEI applies a probability density function known as "triangular distribution" to the values entered. At a minimum, three values are calculated to estimate the underlying range around each cost and benefit.

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 enterprisewide 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 in time. However, having the ability to capture that benefit has a present value that can be estimated. The flexibility component of TEI captures that value.

Appendix B: Glossary

Discount rate: The interest rate used in cash flow analysis to take into account the time value of money. Although the Federal Reserve Bank sets a discount rate, companies often set a 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 organization 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 net present value of cash flows.

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

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

A Note On Cash Flow Tables

The following is a note on the cash flow tables used in this study (see the Example Table below). The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1. Those costs are not discounted. All other cash flows in Years 1 through 3 are discounted using the discount rate shown in Table 2 at the end of the year. Present value (PV) calculations are calculated for each total cost and benefit estimate. Net present value (NPV) calculations are not calculated until the summary tables and are the sum of the initial investment and the discounted cash flows in each year.

Example Table

Ref.	Category	Calculation	Initial cost	Year 1	Year 2	Year 3	Total

Source: Forrester Research, Inc.

Appendix C: About The Project Manager

Michelle Bishop Consultant

Michelle Bishop is a consultant with Forrester's Total Economic Impact (TEI) consulting practice. The TEI methodology focuses on measuring and communicating the value of IT and business decisions and solutions as well as providing an ROI business case based on the costs, benefits, risks, and flexibility of investments.

Prior to joining Forrester, Michelle held leadership roles in operations, technology, and marketing in such large organizations as Shell Corporation and Avaya, Inc. At Shell, she was a product manager for LPG retail distribution initiatives as well as project lead for quality and information security at Shell Philippines. While working at Avaya, she led the inventory reduction program and consulted on various aftermarket operations projects. Michelle also came to Forrester with process improvement and account management experience in high growth startups in media and digital services.

Michelle holds a B.S. in Industrial Engineering from the University of the Philippines and an MBA from the MIT Sloan School of Management.