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HELPING BUSINESS THRIVE ON TECHNOLOGY CHANGE

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The Total Economic Impact™ Of Using ThoughtWorks' "Distributed Agile" Approach Single Company Analysis — Financial Services

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Executive Summary

In June 2004, ThoughtWorks, Inc. commissioned Forrester Research, Inc. to examine the financial impact and potential return on investment (ROI) an enterprise might realize by engaging with ThoughtWorks for a software development project using ThoughtWorks' Distributed Agile development approach. In order to determine the impact, Forrester examined the specific costs, cost savings, flexibility, and the risk elements associated with a financial services organization that engaged with ThoughtWorks in connection with an application development project. The organization is a leading, US based insurance and financial services organization that provides annuities, defined contribution plans and life insurance with annual sales of more than \$3 billion and roughly 5,000 employees.

Purpose

The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of engaging with ThoughtWorks for projects using the Distributed Agile development approach within their own organizations. Forrester's aim is to clearly show all calculations and assumptions that go into the analysis. This study should be seen as a guide to better understand and evaluate ThoughtWorks and its Distributed Agile development methodology to determine whether it is a worthwhile investment.

Methodology

ThoughtWorks selected Forrester for this project because of its expertise in application development practices and Forrester's Total Economic Impact™ (TEI) analysis 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. 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 A for additional information on the TEI methodology.)

Approach

Forrester used a four-step approach for this study. First, Forrester interviewed ThoughtWorks marketing and sales personnel to fully understand its value proposition. Second, using input from existing Forrester research and knowledge around ThoughtWorks and the Distributed Agile development methodology, Forrester representatives conducted in-depth interviews with representatives from the insurance organization. Third, Forrester constructed a financial ROI model representative of the data collected in the interview. Fourth, Forrester created this study, which examines the estimated ROI and represents the findings derived from the customer interview and analysis process, as well as Forrester's independent research.

Key Findings

Table 1 represents a summary of the ROI that the organization projects to achieve resulting from the specific value of ThoughtWorks and the Distributed Agile development methodology. How these financial metrics are calculated is explained in subsequent sections.

Table 1: Summary Financial Results — Interviewed Organization

Summary financial results	Unadjusted (best case)	Risk-adjusted
ROI	56%	41%
Payback	13 months	15 months
Total three-year costs (NPV)	\$956,198	\$1,019,945
Total three-year cost savings (NPV)	\$1,488,817	\$1,439,190

Source: Forrester Research, Inc.

The financial metrics contained within Table 1 illustrate the incremental financial returns that are created from using ThoughtWorks for application development as part of the overall project. The return on investment calculation is based specifically on the costs of ThoughtWorks' contribution and the added benefits that are received from engaging with ThoughtWorks. As part of this analysis, Forrester also examined the different ROI of the entire project if the organization had not used ThoughtWorks and agile development. The overall return from the project if the organization had not engaged with ThoughtWorks would have been 4% over three years. The total ROI of the entire project, with the ThoughtWorks contribution, is 94%.

Disclosures

The reader should be aware of the following disclosures associated with this study:

- The study is commissioned by ThoughtWorks and delivered by the Forrester Consulting group.
- ThoughtWorks and the interviewed organization reviewed and provided feedback to Forrester, but Forrester maintained editorial control over the study and its findings and did not accept changes to the study that contradict Forrester's findings or obscures the meaning of the study.
- The customer name for the interview was provided by ThoughtWorks, Inc.
- Forrester makes no assumptions as to the potential ROI that other organizations will receive within their own environment. Forrester strongly advises that the reader use their own estimates within the framework provided in the study to determine the appropriateness of engaging with ThoughtWorks around Agile development.
- This study is not an endorsement by Forrester of ThoughtWorks or Distributed Agile development.
- The study is not a competitive product analysis.

Brief Description Of ThoughtWorks Agile Development Methodology

ThoughtWorks has invested heavily in a consistent methodology for software development and project management, based largely on Agile development techniques. All consultants are trained in the methodology and share best practices across engagements. ThoughtWorks' overall goals with this methodology are to reduce project risk by enabling visibility into the development process and responsiveness to evolving requirements, and to deliver high-quality software in less time and using fewer resources.

Summary Findings

Developing a TEI model involves a multi-step process. First, Forrester interviewed a customer within the US insurance industry that had used ThoughtWorks and its Distributed Agile development approach on a custom development project. Data provided by the organization allowed Forrester to project a three-year return of between a 41% risk adjusted ROI and 56% non risk-adjusted ROI. Forrester used the interview process to understand the distinct costs and value statements that the organization saw as a result of its engagement. Forrester then constructed a representative model based on those individual costs and value statements. The representative model makes up the main body of this study and should be used by readers as a guide when determining the ROI for their own organizations.

In discussions with the organization, several key drivers of benefits were uncovered:

1. The quality of the ThoughtWorks staff and their ability to handle difficult projects drove efficiency within the organization, reducing the potential for defects and rework down the road potentially associated with complex projects.
2. The use of a Distributed Agile methodology, requiring close communication between IT and business stakeholders, delivered key business requirements — and thus benefits — sooner. Business users had control from the start of the project, ensuring that key business requirements would be met. The organization noted that prioritizing benefits upfront was a key component in seeing the value of ThoughtWorks' approach.
3. The organization was using Distributed Agile development as part of project development. The organization had previously used offshore development and considered this a necessary component in maintaining cost efficiencies. In the past, the organization felt that where offshore development was successful was in cases of large, clearly defined projects with significant management support.
4. The use of a Distributed Agile development methodology was relatively new. The client hoped that it could further leverage ThoughtWorks' experiences on future internal development efforts.
5. For the organization, the alternative to engaging with ThoughtWorks was to continue leveraging a global application development consultancy with a local presence. Issues with this firm's productivity could increase the potential risk that the project would be delivered with limited functionality, given that the system had a fixed end date.
6. The organization was impressed by ThoughtWorks' willingness to share risks on the project and noted ThoughtWorks' readiness to stand behind its commitment to Distributed Agile development approaches.

Description of Organization

This section illustrates a sample ROI analysis for the organization. This model was created as a result of discussions with the organization to determine the underlying costs and benefits of engaging with ThoughtWorks for Distributed Agile development. Data contained within this model is based on information received from each of the interview participants and represents preliminary interview findings. Since this model examines just one customer, data and the financial ROI should not be seen as validation of the potential return that a given organization may achieve from the use of ThoughtWorks. Organizations must use their own data to determine their own potential return.

The organization had the following characteristics:

- The organization is a US-based insurance and financial services institution. The organization has a centrally located IT development and support staff. It currently uses external onshore and offshore consultants for a part of its application development effort.

- The organization was looking for a way to automate and streamline handling of proposals within Pension Operations. In addition, there was a need to develop a more efficient system to generate proposal and legal documents for all businesses that are quick and easy to update. Finally, the system needed to be able to track a proposal from inception to completion.
- The original scope of the project was to roll out the application within a nine-month elapsed timeframe. The original project budget was \$1.88 million. The organization saw that it was under significant time and budgetary constraints given the original project scope. Across the organization's project portfolio, this project was seen as more complex than average.
- The organization had a choice whether to develop the solution in-house using a traditional consultancy for development support or to have ThoughtWorks take on a comparable amount of the development work.
- The organization also saw the engagement with ThoughtWorks as a test of a Distributed Agile methodology. If successful, components of the Agile methodologies could be applied on subsequent internally driven application development projects.
- The project would be measured on a three-year investment life cycle.

Based on these assumptions, it is possible to construct a financial model that examines the costs and benefits of moving forward with a ThoughtWorks solution.

Costs Of The ThoughtWorks Contribution

The cost of ThoughtWorks consulting fees is a part of the overall cost of the project. Thus, it is necessary to first describe the specific cost structure around the individual project. For the purpose of this analysis, we make the following assumptions around the cost of the project and the cost of ThoughtWorks' contribution:

- The project has a two-year cost projection of an estimated \$1.88 million. This includes the cost of internal and external staff, training, hardware and software improvements. The cost of the project is accrued into the first two years, with 88% in the first year and 12% in the second year. As a result, the total cost allocation in year one is \$1.65 million and in year two is \$233,000. This includes the costs attributed to ThoughtWorks' services.
- The ThoughtWorks cost component was estimated to be 54% of the overall cost of the project. This includes the billable cost of ThoughtWorks staff as well as the indirect costs of planning for and managing of the ThoughtWorks relationship. Table 2 illustrates the ThoughtWorks and non-ThoughtWorks cost components of the project. We assume a 10% yearly discount rate on the cost of capital for the representative organization.

Table 2: Overall Project Cost — ThoughtWorks Versus Internal Project Cost

	Year 1	Year 2	Year 3	Total	PV
ThoughtWorks cost	\$970,000	\$90,000	0	\$1,060,000	\$956,198
Internal cost	\$680,099	\$143,408	0	\$823,507	\$736,791
Total project cost	\$1,650,099	\$233,408	0	\$1,883,507	\$1,692,989

Source: Forrester Research, Inc.

For the purpose of this analysis, we assume that the ThoughtWorks cost will be used as a basis for the investment in the ROI calculation.

Benefits And Savings Of Engaging With ThoughtWorks Agile Development

In speaking with the organization, Forrester discovered several benefits of the use of Distributed Agile development within their environment. First, ThoughtWorks teams drove efficiency within the customer's IT organization by minimizing the potential that unforeseen changes or errors would increase in overall project cost. In addition, moving critical functionality to the start of the project had the effect of increasing the speed with which benefits were achieved. This second benefit can potentially impact areas outside of IT since benefits attributable to the entire organization will be realized sooner.

IT project efficiency was also a benefit. The organization stated that even though its initial impression was that the ThoughtWorks component would come in at a higher initial cost than existing alternatives (e.g., in-house development, previously employed consultants), the efficiency created by the ThoughtWorks engagement resulted in lower overall cost due in part because of less rework after the first release. This was a result of the quality of the ThoughtWorks employees and the fact that use of their existing knowledge base reduced the amount of development errors and downstream changes compared to previous development projects. Smaller increments build on one another, since it is possible to learn from earlier iterations and apply those experiences to subsequent iterations. This, in turn, increased the productivity of the customer's development staff, allowing them to assign fewer internal resources over the life of the project and more time to other initiatives.

For the purpose of this analysis, the organization assumed that one area where reduction in errors ties directly into the final internal and external costs was around the reduction in subsequent rework. Table 3 provides an estimate in the reduction in internal effort created by ensuring that the risk of errors or failure has been reduced.

Table 3: ThoughtWorks Contribution To IT Efficiency

Cost to manage			
Number of FTEs to support before			5
Number of FTE to support after			3
		Hours per year	Cost per hour
Cost per worker	\$ 124,800	2,080	\$ 60
Total yearly cost savings			\$ 249,600

Source: Forrester Research, Inc.

This savings was primarily driven by ThoughtWorks' ability to simplify the application development process, reducing the number of Java classes from 179 to 17. Using these savings as a guide, we can estimate the cost differential between the ThoughtWorks and non-ThoughtWorks solution. Using the sample \$1.8 million engagement (net present value of \$1.7 million), as stated above, the cost of a comparatively complex project would be roughly a net present value of \$2.3 million, 37% more expensive than the ThoughtWorks solution. Table 4 illustrates these savings. For this analysis, it is assumed that the direct cost per hour per resource is less for the alternative; the fact that the organization would have to devote more resources to the project increases its overall cost compared to the ThoughtWorks solution.

Table 4: Project Efficiency Savings With ThoughtWorks

	Year 1	Year 2	Year 3	Total	PV
Cost with ThoughtWorks	\$1,650,099	\$233,408	\$0	\$1,883,507	\$1,692,989
Cost with alternative	\$1,929,939	\$483,008	\$249,600	\$2,662,547	\$2,341,198
Savings from ThoughtWorks	\$249,600	\$249,600	\$249,600	\$748,800	\$620,718

Source: Forrester Research, Inc.

Time to benefit also was a positive. In addition to driving IT efficiency, ThoughtWorks’ use of Distributed Agile development sped up the time to implementation and therefore allowed the organization to realize business benefits sooner. The organization indicated several factors that led to this benefit. First, ThoughtWorks’ ability to understand the business needs upfront and help its clients to prioritize specific functionality allowed key benefits to be realized early. This created further buy-in from the business side and reduced the risk of scope creep. In addition, ThoughtWorks’ experienced staff was adept at handling complex development projects, thus reducing the risk that project benefits might not be achieved. The customer also noted that the ThoughtWorks worked overtime to meet the fixed time requirements of the project. Table 5 illustrates the ramp up time between the project using ThoughtWorks and a project without including ThoughtWorks.

Table 5: Percent Complete

Date	% complete with ThoughtWorks	% complete alternative
3 months	45%	10%
6 months	75%	20%
8 months	100%	50%
12 months	100%	75%
14 months	100%	100%

Source: Forrester Research, Inc.

For the purpose of this analysis, the following steps were used to determine the magnitude of this benefit for the representative organization. First, it is necessary to understand the amount of benefits created as a result of the overall project. Table 6 illustrates the percent breakdown of benefits resulting from the overall pension plan project.

Table 6: Percent Breakdown Of Benefits For Overall Development Project

Benefits of application		ThoughtWorks	Alternative
Manageability	64%	\$2,088,956	\$1,533,584
End user improvements	15%	\$497,370	\$365,139
Standard form updates	21%	\$678,911	\$498,415
		\$3,265,237	\$2,397,137

Source: Forrester Research, Inc.

For this analysis, the organization expected to achieve roughly a 94% return on the overall project. So, for example, if the present value cost of the overall project was estimated to be \$1.7 million, the present value benefits would equate to roughly \$3.3 million ($(3.3-1.7)/1.7 = 94\%$). Table 6 illustrates the cash flow that is achieved from the overall project.

Table 7: Project Cash Flow With ThoughtWorks

With ThoughtWorks	Year 1	Year 2	Year 3	Total	PV
Cost of project	\$1,650,099	\$233,408	\$0	\$1,883,507	\$1,692,989
Benefits received	\$1,313,000	\$1,313,000	\$1,313,000	\$3,939,000	\$3,265,237
Cash flow	-\$337,099	\$1,079,592	\$1,313,000	\$2,055,493	\$1,572,247

Source: Forrester Research, Inc.

We therefore assume that roughly \$1.3 million in benefits are realized in each year of analysis.

Conversely, if the representative organization chose not to engage with ThoughtWorks, the time to realize benefits would be lengthened, therefore reducing the total amount of benefits achieved within the three-year timeframe and extending the payback for the project.

During the interview process, the organization noted that time to benefit was a key determinant in choosing ThoughtWorks. For the purpose of this analysis, the organization assumed, based on statements by the alternative vendor, that the benefits would be delayed six months using an alternative, similar-sized project, causing the ramp up time to receive benefits to be extended. The cash flow for that project appears in Table 8.

Table 8: Project Cash Flow With Alternative Development Solution

With alternative	Year 1	Year 2	Year 3	Total	PV
Cost of project	\$1,899,699	\$483,008	\$249,600	\$2,632,307	\$2,313,707
Benefits received	\$656,500	\$984,750	\$1,313,000	\$2,954,250	\$2,397,137
Cash flow	-\$1,243,199	\$501,742	\$1,063,400	\$321,943	\$83,430

Source: Forrester Research, Inc.

The decrease in benefits as well as increase in cost from reduction in efficiency causes this project to realize a minimal return on its investment. Benefits are created, but they are less than in the ThoughtWorks case and costs are higher due in part to the reduced efficiency as compared to the ThoughtWorks project.

The resulting net present value savings for both IT efficiency and time-to-market savings equate to \$1,488,817 over three years, which is the difference in the cash flow between Table 7 and Table 8.

Risks Associated With Estimates Of Costs And Benefits

Risk-adjusted and non risk-adjusted ROI are both discussed in this study. Risk assessments provide a range of possible outcomes, based on the risks associated with IT projects in general and specific risks relative to moving toward a new technology solution. In this study, Forrester discovered that engaging with ThoughtWorks was a relatively low-to-medium risk endeavor, as expressed by the interviewed organizations as compared to similar past projects that were undertaken without ThoughtWorks assistance.

Risk factors are used in TEI to widen the possible outcomes of the costs and benefits (and resulting savings) associated with a project. Since the future cannot be accurately predicted, there is risk inherent in any project. TEI captures risk in the form of risks to benefits and risks to costs.

The following general risks were considered in this study:

- Lack of organizational buy-in to measure and track specific benefits created by engaging with ThoughtWorks.
- Lack of sufficiently trained internal staff to interact and meet the requirements of a ThoughtWorks-driven project.
- Failure to reduce, transfer, or redeploy IT support and business unit headcount made redundant in a ThoughtWorks-driven project.
- Changing external market conditions that may decrease time-to-market benefit estimates.

The following risks associated with distributed development projects were considered in this study:

- There is a risk that costs will be greater than anticipated. Experience indicates that implementing projects across two or more sites will be a significant risk factor for cost. Large teams add even more risk.
- There is a risk that benefits will not be realized as expected due to lack of accurate and/or effective communication between distributed groups.

If a risk-adjusted ROI still demonstrates a compelling business case, it raises confidence that the investment is likely to succeed since 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 value considering risk. Assuming normal success at mitigating all risk, the risk-adjusted numbers should more closely reflect the expected outcome of the investment.

Table 9: Summary Financial Risk-Adjusted Results – Interviewed Organization

Summary financial results	Unadjusted (best case)	Risk-adjusted
ROI	56%	41%
Payback	13 months	15 months
Total three-year costs (NPV)	\$956,198	\$1,019,945
Total three-year cost savings (NPV)	\$1,488,817	\$1,439,190
Total three-year net savings (NPV)	\$532,619	\$419,245

Source: Forrester Research, Inc.

Conclusions

This study is meant to provide the reader with a framework in examining the costs and benefits of engaging with ThoughtWorks using ThoughtWorks Distributed Agile approach. Data derived from an individual customer interview corroborates Forrester Research findings around the potential for Agile development to drive cost efficiencies within a given environment. The core tenets of Agile development — short iterative cycles, empowered teams, constant reprioritization of requirements, and strong business participation — all lead to increased benefits. Delivering core requirements in shorter timeframes leads to increased financial benefits. Increasing team efficiency reduces both development and maintenance costs, and frees the development organization to address other projects. Each of these can be quantified using Forrester's TEI model.

Not every project is a good fit for Agile or Distributed Agile development, but ThoughtWorks has demonstrated that applying Agile processes and strong project management can potentially be a benefit to high-risk projects. Its emphasis on hiring and retaining highly skilled staff is also a key success factor.

Appendix A: Total Economic Impact™ Primer

Total Economic Impact™ is primarily a common language tool, designed to capture and properly communicate the value of IT initiatives in a common business language. In so doing, TEI considers four elements of any initiative:

1. Benefits
2. Costs (sometimes referred to as total cost of ownership (TCO))
3. Flexibility
4. Risk

The figure below shows the TEI methodology conceptually. Benefits, flexibility, and costs are considered, through the filter of risk assessment, in determining an expected ROI for any given initiative.

Benefits

Benefits represent the *value* delivered to the business by the proposed project. Oftentimes, IT project justification exercises focus on cost (e.g., TCO) and cost reductions. Among industry leaders, IT is deployed as an offensive weapon, with value expectations greater than simple cost reduction, especially when those cost reductions tend to focus within IT. TEI captures the value proposition of the proposed project by measuring the benefits against the incurred costs.

All benefits captured by TEI must be traceable back to one or more critical success factors (CSFs). These CSFs are directly linked to a higher-level business strategy. If a proposed technology investment generates benefits that cannot be satisfactorily linked to a CSF, then it will not be included as a benefit for the organization in the model. In these cases, TEI requires that the benefit be discarded.

Under TEI, benefits may only accrue to the business units. “Benefits” derived through cost reductions within IT accrue as negative TCO to the IT budget, thereby showing a reduced TCO. (TCO is considered by TEI to be a single-dimension, cost-centric focus on the IT budget.)

The TEI process begins with a discovery of potential benefit areas. A representative from the organization under examination who has the ability to capture the benefit in question must validate each benefit captured during discovery. In other words, values cannot arbitrarily be assigned to a benefit if that person is not in a position to deliver that benefit should the project be approved.

Additionally, projects that are expected to deliver business value require some effort on the part of the business to realize that value. That effort may be in the form of training, organizational change or a modification of existing business processes. Therefore, TEI requires dialog with the business leaders actually responsible for making the necessary changes, in order to capture the proposed benefit during the justification phase. TEI captures this dialog in the form of the names of the individuals, which validates the value calculation of each benefit.

Within TEI, each benefit entered has a specific capture date. Although the benefit may be captured over time, TEI requires the specification of a date when most of the benefit has been captured. TEI will then place the value delivered in the appropriate time frame within the project.

Costs

Costs represent the investment necessary to capture the value, or benefits, of the proposed project. IT or the business units may incur costs. These may be in the form of fully burdened labor, subcontractors or

materials. Additionally, costs consider all the investment and expenses necessary to deliver the value proposed.

Flexibility

Flexibility, as defined by TEI, represents investing in additional capacity that can, for some future additional investment, be turned into business benefit — for instance, an investment in an enterprisewide upgrade of the desktop word processor application where the primary driver may be standardization (to increase efficiency) and licensing (to decrease IT costs). However, a collaborative workgroup feature may translate into greater worker productivity when the organization is ready to absorb the discipline necessary to capture that benefit. The collaboration feature does not promise benefit during this phase of the project and must be captured later, incorporating additional investment, most likely in the form of training. However, the existence of the option has a present value that can be estimated. The flexibility component of TEI captures that value.

Risk

Risks are used to widen the possible outcomes of the project. Since the future cannot be accurately predicted, there is risk inherent in any project. TEI captures risk in the form of risks-to-benefits and risks-to-costs.

Risks-to-benefits considers all possible risks to each possible benefit. Likewise, risks-to-costs considers all possible risks to each possible cost. Then, a range is chosen by applying best judgment for each cost and benefit, based on the set of risks assigned to each cost and benefit. The range is entered in the form of a low estimate, a most likely value and a high estimate. For example, the risks to a cost may result in a range from the expected value as the low estimate, to two times the expected value as the high for a particular cost (representing a potential two times cost overrun).

Appendix B: Forrester Copyright

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