The Total Economic Impact™ Of IBM's Design Thinking Practice

How IBM Drives Client Value And Measurable Outcomes With Its Design Thinking Framework

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Benefits And Costs
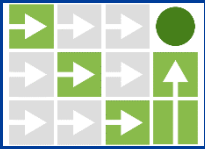
IBM's Design Thinking practice cuts costs by accelerating projects:

$20.6 million

IBM's Design Thinking practice reduces risk and increases portfolio profitability:

$18.6 million

2x
Faster time-to-market

75%
Reduced design time

33%
Reduced development time

Executive Summary

Design thinking places end users at the center of the design process and enables teams to collaborate and work more efficiently. IBM leverages this framework in their Design Thinking practice across its diverse portfolio of products and services to help clients reduce costs, increase speed, and design better solutions. IBM commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by engaging IBM's Design Thinking practice. The purpose of this study is to provide readers with a framework to evaluate design thinking's potential financial impact for both individual projects and a grander organizational transformation.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed four of IBM's Design Thinking clients and surveyed an additional 60 executives who have employed design thinking at their organizations, some with and some without IBM. These organizations turned to design thinking to address a variety of challenges:

› Refine business strategy to invest in solving the most promising opportunities while mitigating the risk of bad investments.

› Remedy an inhibiting 'No' culture by energizing and empowering employees to think creatively without fear of failure or retribution.

› Design better products to improve customer experience (CX) and sales.

› Speed up sluggish project design and execution.

› Streamline burdensome processes to reduce overhead.

Interviewees found that IBM's Design Thinking practice successfully partnered with their organizations to address these challenges and enhance culture, speed, efficiency, customer experience, and profitability.

Key Findings

Quantified benefits. The following risk-adjusted quantified benefits are representative of those experienced by the organizations interviewed:

› **Project teams doubled design and execution speed with IBM Design Thinking.** Profits from faster releases combined with reduced design, development, and maintenance costs to deliver $678K per minor project and $3.2M per major project, for $20.6M in total value.

　• **Organizations slashed the time required for initial design and alignment by 75%**. The model demonstrates cost savings of $196K per minor project and $872K per major project.

　• **Project teams leveraged better designs and user understanding to reduce development and testing time by at 33%** This equates to cost savings of $223K per minor project and $1.1M per major project.

　• **IBM's Design Thinking practice helped projects cut design defects in half.** Projects were more successful in meeting user needs, thereby reducing design defects and subsequent rework to save $77K per minor project and $153K per major project.

　• **Faster time-to-market enabled increased profits from net-new customers and the higher present value of expected profits.** Faster time-to-market increased profits by $182K per minor project and $1.1M per major project.

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ROI
301%

Benefits PV
$48.4 million

NPV
$36.3 million

› **Human-centered design improved product outcomes, reduced the risk of costly failures, and increased portfolio profitability.** Refined strategic prioritization enabled investments in solutions that were less likely to fail. Better design increased average product profits. IBM helped expand design thinking at the organization over three years to penetrate one quarter of the entire portfolio, enabling $18.6M in increased profits.

› **Cross-functional teams collaborated to share problems and find solutions, reducing costs by $9.2M in streamlined processes.**

Survey Highlights. Data from sixty survey respondents provided the following notable insights:

› Improved collaboration and business strategy drove increased customer experience and sales, streamlined processes, and reduced project labor.

› 52% of survey respondents associated IBM with design thinking.

› 72% of IBM clients utilize design thinking in most or all teams.

Unquantified benefits. The interviewed organizations experienced the following benefits, which are not quantified for this study:

› Encouraged an empowered, engaged, and happy workforce.

› Enhanced KPIs such as UI, UX, CX, NPS, and brand energy.

› Perfected internal processes for HR, sales, and beyond.

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

› Internal labor and IBM fees for projects totaled $6.8M, driven by distinct costs of $159K per minor project and $1.5M per major project.

› Transformation costs reached $5M in IBM resources and internal labor.

› Training incurred costs of $218K in IBM facilitation and internal labor.

Forrester's interviews with four existing IBM clients, data from 60 survey respondents, and subsequent financial analysis found that a composite organization based on these interviewed organizations experienced benefits of $48,360,958 over three years versus costs of $12,045,247 by engaging with IBM's Design Thinking practice, adding up to a net present value (NPV) of $36,315,711 and an ROI of 301%.

Financial Summary (Three-Year)
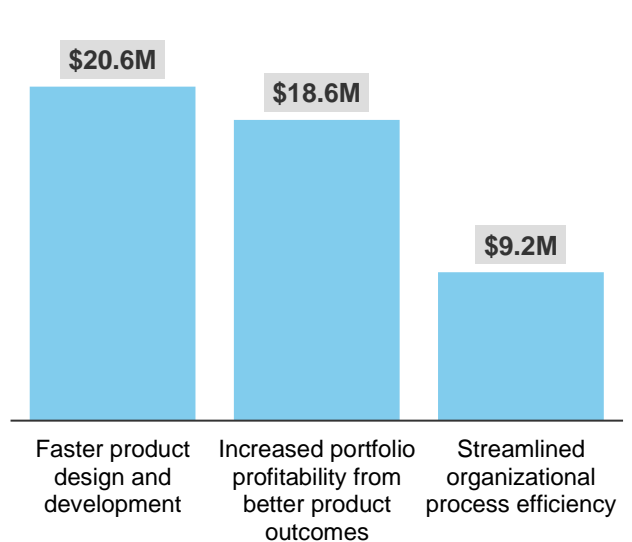
- Total benefits
- Total costs
- Cumulative net benefits

(y-axis: $50M, $40M, $30M, $20M, $10M, $0M, -$10M, -$20M)
(x-axis: Initial, Year 1, Year 2, Year 3)

Benefits (Three-Year)

$20.6M	$18.6M	$9.2M
Faster product design and development	Increased portfolio profitability from better product outcomes	Streamlined organizational process efficiency

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TEI Framework And Methodology

From the information provided in the interviews, Forrester has constructed a Total Economic Impact™ (TEI) framework for those organizations considering engaging IBM's Design Thinking practice.

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's Design Thinking practice can have on an organization:

DUE DILIGENCE
Interviewed IBM stakeholders and Forrester analysts to gather data relative to IBM's Design Thinking practice.

CLIENT INTERVIEWS
Interviewed four organizations working with IBM's Design Thinking practice to obtain data with respect to costs, benefits, and risks.

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

FINANCIAL MODEL FRAMEWORK
Constructed a financial model representative of the interviews using the TEI methodology and risk-adjusted the financial model based on issues and concerns of the interviewed organizations.

CASE STUDY
Employed four fundamental elements of TEI in modeling IBM Design Thinking's impact: benefits, costs, flexibility, and risks. Given the increasing sophistication that enterprises have regarding ROI analyses, 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.

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Isolating IBM Design Thinking's Business Impact

Design Early, Design Right

It is essential to identify, design, and build solutions that effectively solve users' problems. Organizations must prioritize and invest in the creative design process to avoid expensive delays, gain competitive advantage, deliver exceptional customer experiences, and uphold employee morale.

If a team discovers recommends a redesign or pivot, the business would be wise to listen; yet consequences of a change increase with every project phase that elapses. While some delivery models (such as agile versus waterfall development) may be more adept at handling changes, all project types and delivery models will experience increasing costs and resistance during later phases of project work.

The Consequences Of Redesign As Project Phases Elapse

IMPACT	DESIGN	BUILD	TEST	AFTER RELEASE
Costs incurred by redesign *Fail fast, fail cheap*	$	$$	$$$	$$$$+
Time required to redesign *Beware competitors beating you to market*	Hours to days	Days to weeks	Weeks to months	Months, years, or never
Agility to pivot project strategy, design, and requirements *Resistance to change grows quickly*	› Easily and quickly gather ideas, mock up solutions, test what resonates, and define strategy.	› Changes can be accommodated with low to medium costs, though resistance begins to surface.	› Very difficult to socialize and get approval for major changes.	› Pivoting is now an entirely new project requiring new contracts, budgeting, prioritization, and approval.
Impact on team morale *Employees start energized, but become frustrated and inflexible*	› Energizing design process excites and inspires employees to be creative.	› Excited employees retain creativity as they begin to work through and solve problems.	› Employees become frustrated by rework and lose motivation. › Employees begin to lose faith in leaders.	› Pessimism abounds as employees oppose redoing entire projects. › Employees may have lost faith in leadership.
Impact on users and the bottom line *Prioritize and solve key problems to grow the business*	› Discover new opportunities. › Prioritize the most important projects. › Ensure projects meet user needs. › Maximize profits versus costs. › Deliver great UX/CX. › Cancel projects early to avoid wasted costs.	› Limited risk of project cancellation. › Limited expense for major changes. › Change course early in development to meet timelines.	› High risk of project cancellation. › Expensive to make major changes. › Users must wait much longer for project completion.	› Possibility the project is 'dead on arrival,' failing to generate revenue. › Underperforming sales, revenue, and profits. › Negative impacts on retention and acquisition. › Damaged brand image, UX, CX. › High maintenance and customer support costs.

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Design Thinking's Value Proposition

Design thinking is a framework for teams to collaborate and work more efficiently, while placing end users at the center of the design process. Organizations achieve a variety of benefits such as the following:

› Design solutions that better meet the needs of end users, to delight customers and ultimately increase profits.

› Refine business strategy by identifying and investing in the most impactful user problems to reduce business risk and improve results.

› Energize employees to be more collaborative, do better work, and achieve heightened job satisfaction.

› Discover redundant or wasteful processes to streamline efficiency.

› Complete projects faster with reduced costs and labor.

IBM's Design Thinking framework is best known for rapidly scaling these practices across geographies, organizational boundaries, and projects:

› Workshops unite diverse perspectives and democratize decisions.

› User research paired with sponsor user participation ensures teams truly understand what users want and how they will use a solution.

› Project teams stay in sync during outcome based 'hills' dotted by regular 'playbacks' to exchange feedback.

› Accelerated visioning runs through creative possibilities quickly and iteratively to create a design and architectural project framework.

Design thinking has applications in every part of an organization, and therefore it should be of no surprise that its impact varies. Yet, the core results from interviewed organizations and survey respondents are clear: impressive returns versus modest costs.

What This Study Is . . . And What It Is Not

IBM's Design Thinking practice extends across virtually their entire product portfolio, their service delivery arms, and their internal HR and CIO organizations, but the framework is consistent. In this case study, Forrester has leveraged its Total Economic Impact methodology to isolate and quantify the specific impact IBM's Design Thinking framework delivers across their products. Let's consider what that means:

› This study measures the marginal profit increases, better investments, and reduced risks that are specifically attributable to better design and faster time-to-market achieved by customers of IBM's Design Thinking practice. It does not measure the entire profit associated with a project.

› This study isolates the labor costs and fees directly attributable to the design thinking framework such as research, workshops, accelerated visioning, and sponsor users. It measures the specific reduction in total time for design and execution that is directly attributable to design thinking, not the entire cost of design and development; in fact, it does not distinguish the type of project and whether the project team is from IBM, the client, a third party, or any combination thereof.

› This study measures the initial costs and efficiency benefits for the early years of an organizational transformation that is enabled by IBM's education, training, coaching, and advocacy to teach its design thinking framework. It does not measure the impact of other consulting, business, or technology services that IBM may provide for a client.
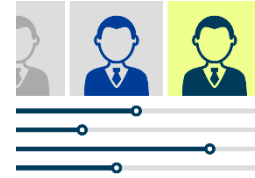
Why Design Thinking?

› Refine strategy.

› Minimize risk.

› Reduce costs.

› Energize employees.

› Improve speed.

› Design better solutions.

› Delight customers.

In this case study, Forrester has employed its Total Economic Impact methodology to isolate and quantify the specific impact that is directly attributable to IBM's Design Thinking framework, agnostic of the IBM product or team a client has engaged.

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Voice Of The Market

HOW SURVEY RESPONDENTS UNDERSTAND, INVEST IN, AND MEASURE THE IMPACT OF DESIGN THINKING AT THEIR ORGANIZATIONS

Survey Respondent Demographics

To first understand the broad perception of design thinking, Forrester conducted an online survey of 60 US-based respondents to evaluate their attitudes and experiences regarding design thinking. Respondents were not in any way aware that this survey was part of a study commissioned on behalf of IBM. The study focused on understanding organizations' perception of design thinking, the key challenges they hoped to address with the framework, and the impacts they achieved in doing so. Survey respondents were represented based on the following key demographics:

› A range of large to very large organizations and enterprises across a broad swath of industries.

- Thirty-eight percent earn between $100M and $1B in annual revenue.
- Twenty-two percent earn between $1B and $5B in annual revenue.
- Forty percent earn more than $5B in annual revenue.

› The number of employees varied, though all were staffed by at least 1,000 employees:

- Thirty-five percent are between 1,000 and 4,999 employees.
- Twenty-seven percent are between 5,000 and 19,999 employees.
- Thirty-eight percent are at organizations over 20,000 employees.

› Survey respondents primarily represented IT/technology (57%), executive management and strategy (27%), and operations (13%).

› Respondents shared high levels of seniority:

- Thirty-three percent at the director or executive director level.
- Twenty-five percent at the VP, SVP, or EVP level.
- Thirty-eight percent at the C-level (CIO, CTO, CEO, CFO).

› All respondents had significant strategic authority at their organization, with 73% of respondents identifying that they "are the final decision maker for the strategic planning process" and the other 27% identifying as an influential part of the organization's strategic planning team.

› These organizations have leveraged design thinking for at least six months, broken down into the following time spans:

- Forty-five percent over two years.
- Thirty percent between one and two years.
- Twenty-five percent between six and twelve months.

> Survey respondents were not aware that the survey was part of a study commissioned on behalf of IBM.

Number of employees

How long has your organization been using design thinking?

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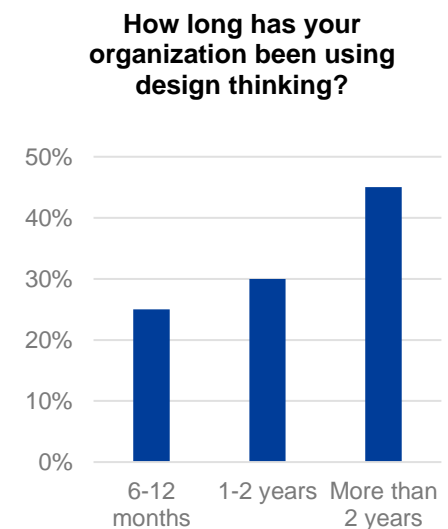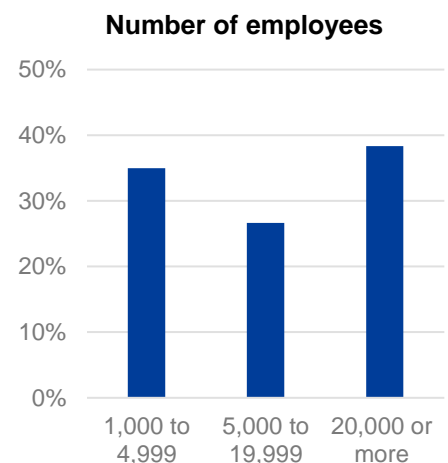
Awareness Of IBM's Design Thinking Practice

Respondents were broadly surveyed to learn who they affiliated with design thinking frameworks. IBM was the most cited organization with 52% of the 60 survey respondents associating IBM with design thinking. Further, 36% of respondents engaged directly with IBM to implement design thinking at their own organizations.

What organizations do you associate with design thinking?

IBM 52%

52% of respondents associated IBM with design thinking

36%

Engaged IBM to implement design thinking at their organization
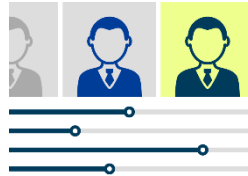
72%

Use design thinking in most or all teams at their organization
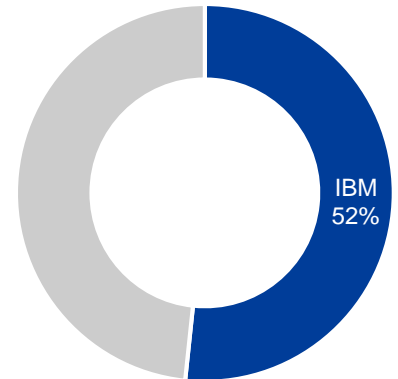
Survey respondents who engaged with IBM to support their design thinking efforts reached a higher level of maturity than those who did it themselves or with an alternative partner. Seventy-two percent of IBM's clients utilized design thinking in between 70% to 100% of their teams, whereas only 60% of others reached the same penetration.

Organizational Penetration Of Design Thinking

Percent of respondents

- Using design thinking across all teams
- Using design thinking in most teams (over 70%)
- Using design thinking in roughly half of teams (between 30% and 70%)
- Using design thinking in only a few teams (less than 30%)
- Using design thinking in only one team

■ IBM client   ■ Alternative partner or self-implemented

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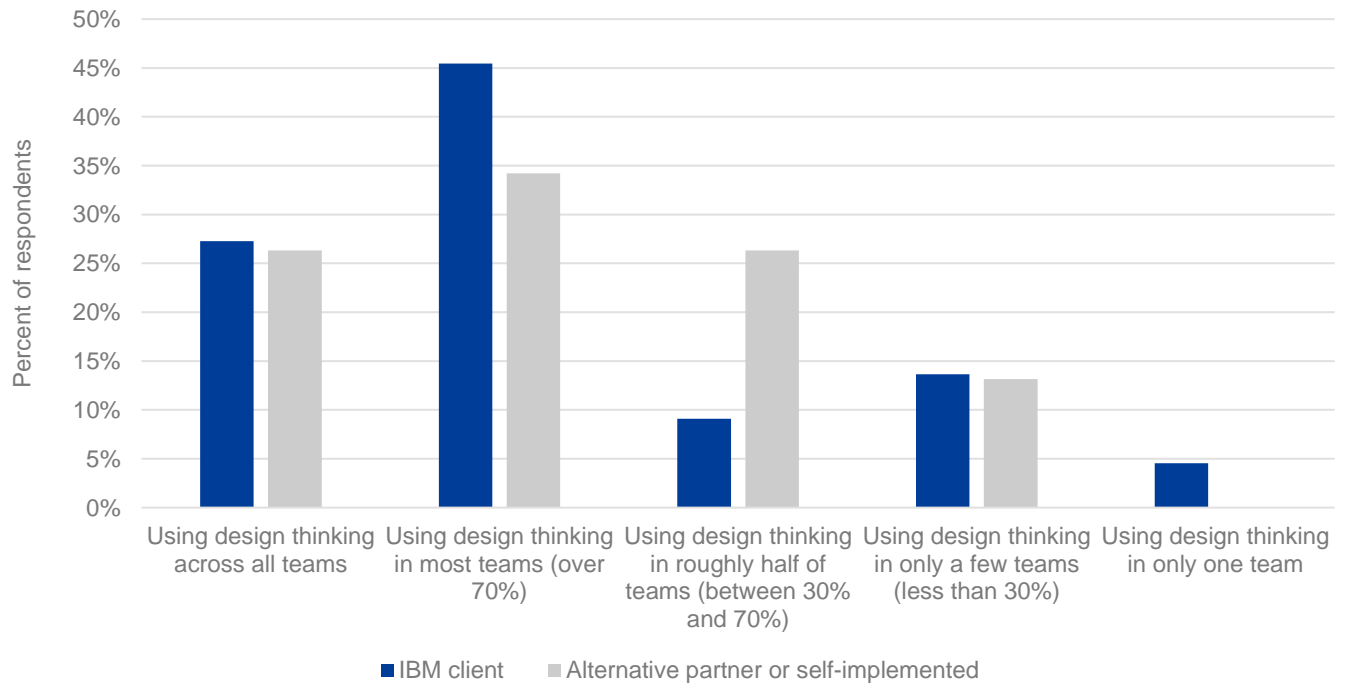
Maturity Of Design Thinking Practices

The number of employees who have participated in design thinking at respondents' organizations varied widely, with a minimum of 34 and a maximum of 12,000 — for a mean of 3,000 and a median of 1,000 employees across the sample. It can take repeated exposure and executive investment to truly convert teams, however, as respondents currently identify that 17% have reverted to their old practices after being exposed to the framework, another 22% only continue to use it in small pockets. With effort, comes success — and 28% of respondents have been successful in building a permanent, sustainable new company culture around design thinking.

Which of the following best describes the maturity of your organization's design thinking practice and how it has changed the way your teams work?
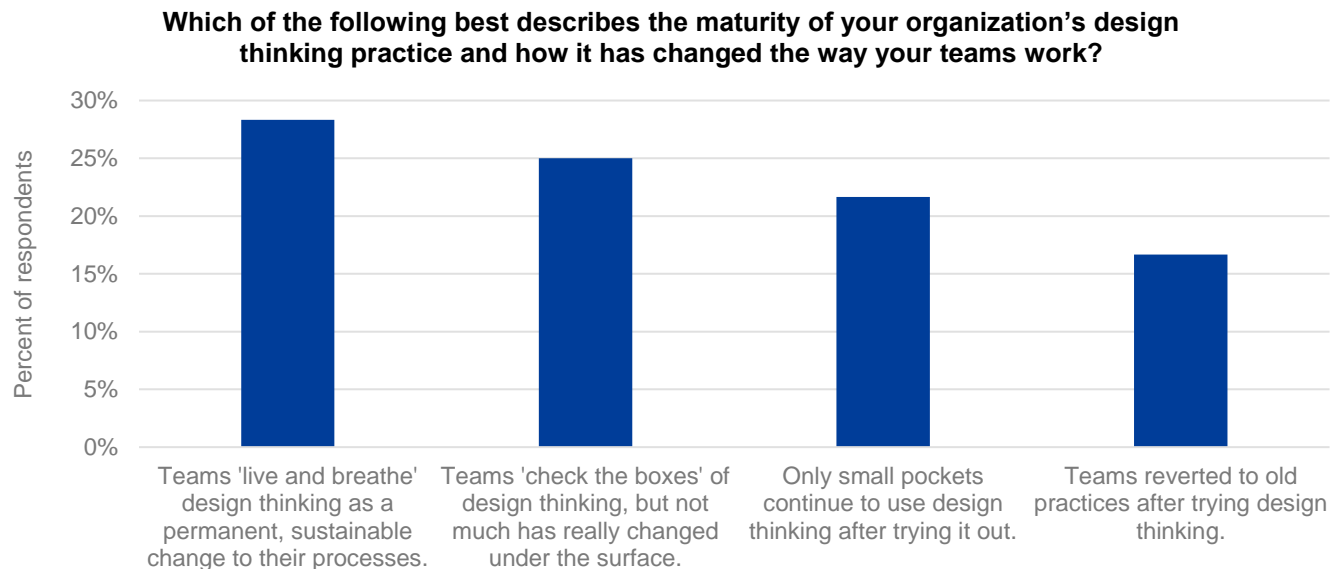
Surveyed organizations are achieving increasing adoption, as 78% of all respondents identified that design thinking's adoption has increased over the past two years, with only 7% seeing a decrease in its usage.

How has your company's use of design thinking changed over the past one to two years?

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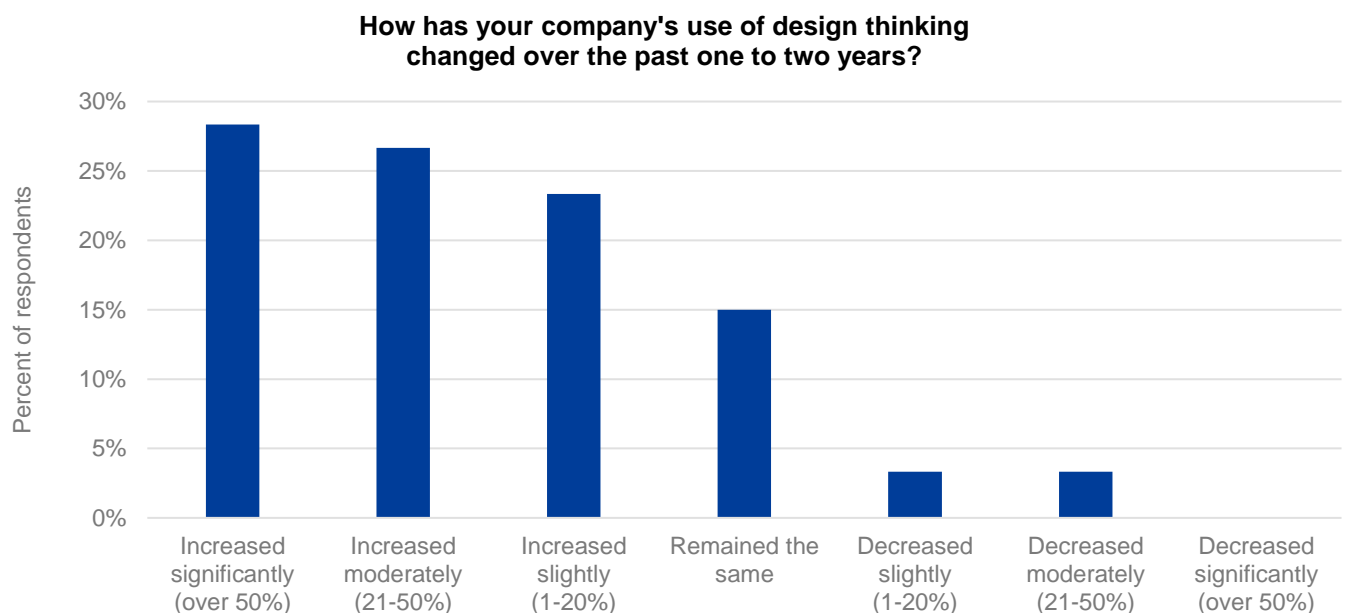
Drivers Of Adoption

Respondents identified a variety of significant challenges faced by their organizations prior to introducing the design thinking framework:

How serious were the following challenges prior to using design thinking?

Legend: ■ Not challenging ■ Mildly challenging ■ Very challenging

Categories (top to bottom):
- Excessive costs or overhead
- Gathering project requirements
- Lack of shared vision
- Low employee engagement
- Making decisions
- Missed collaborative opportunities
- Poor employee morale
- Poor team relationships
- Projects did not solve actual needs
- Quality concerns
- Siloed team/employee efforts
- Slow market adaptation
- Slow releases
- Unnecessary or redundant work

X-axis: 0% 20% 40% 60% 80% 100%
Percent of respondents

In the face of these challenges, survey respondents turned to design thinking. Their reasons are broad: customer satisfaction tops the list at 38%, followed by better identification and prioritization of business strategy and a reduction in time-to-market, both at 32%. Process efficiencies were essential as well, such as improved productivity, improved internal collaboration, and reduced waste and overhead.

What were your organization's top three priorities or business objectives for introducing design thinking?

Categories (top to bottom):
- Improve customer satisfaction
- Identify and prioritize strategic business opportunities
- Reduce time-to-market
- Improve productivity
- Increase sales
- Improve internal collaboration
- Identify and eliminate waste
- Reduce overhead
- Improve employee satisfaction

X-axis: 0% 10% 20% 30% 40%
Percent of respondents

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Instrumenting Change

Survey respondents identified common challenges to rolling out a successful design thinking initiative. Resistance to change was first and foremost — from employees, from teams, and from leadership. People were accustomed to their normal ways of doing things and needed to be exposed to the design thinking framework first, then nurtured and encouraged to slowly build adoption.

What challenges do you face in generating interest for design thinking?

Challenge	Percent of respondents
Employees resistant to change	~32%
Teams resistant to collaborating	~27%
Employees doubt effectiveness of Design Thinking	~22%
Leadership is resistant to change	~22%
Perceived difficulty for remote/dispersed teams	~20%
Leadership doubts effectiveness of Design Thinking	~20%
Leadership does not believe investment is worthwhile	~8%

Percent of respondents

Investment in design thinking went primarily into broad, strategic ventures for business strategy (58%) and organizational restructuring (33%). Operations saw significant investment towards process improvement (35%), and software development, product, and marketing all saw noteworthy investment priority of over 25%. Underlying all investments were the desires to invest in stronger business ventures, improve efficiency, and ultimately deliver better customer experience.

In what aspects of your business did you implement design thinking?

Aspect	Percent of respondents
Business strategy	~58%
Operations	~35%
Organizational redesign or restructuring	~33%
Software development	~29%
Product	~29%
Marketing	~29%
New CX experiences	~25%
Services delivery	~23%
Sales	~20%
Partner integration	~18%

Percent of respondents

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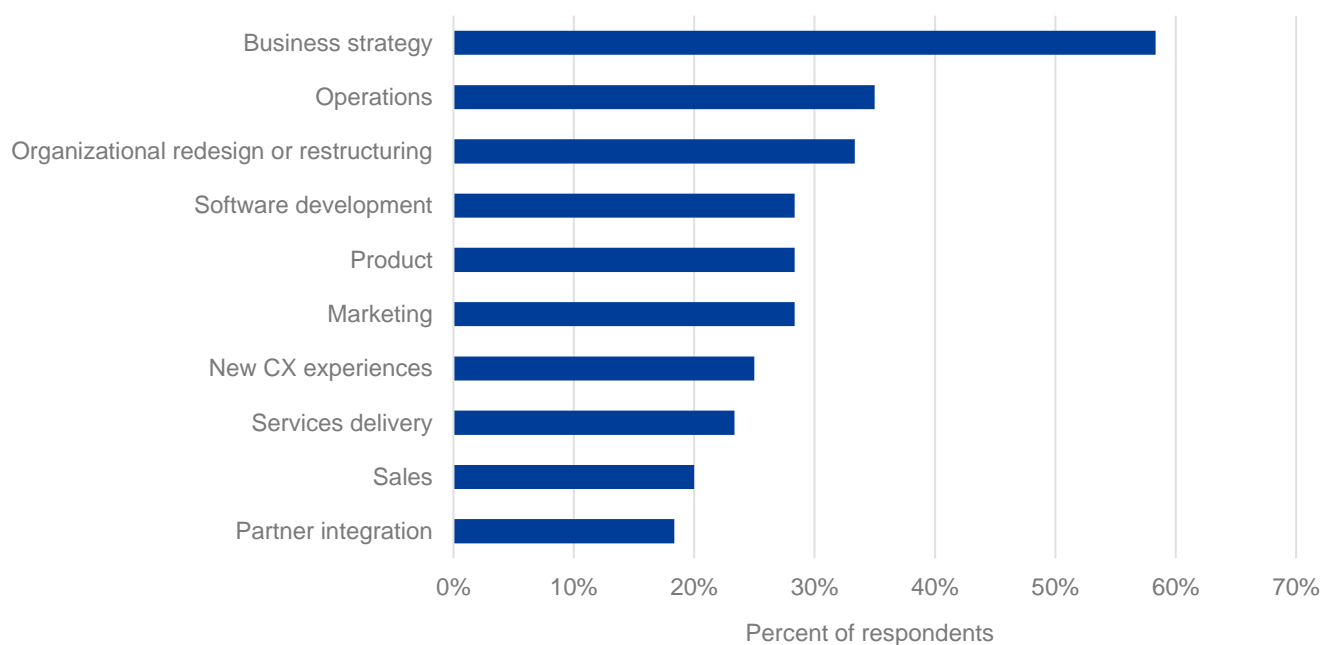
Business Impacts

Ultimately, survey respondents identified significant positive effects for key organizational initiatives through the use of design thinking. Whether discovering, prioritizing, or solving the top strategic efforts or coming to a better understanding of employees and customers through collaboration, respondents consistently identified positive impacts of between 68% to 92% on these initiatives as shown here:

Does design thinking help with the following business initiatives?

Legend: ■ Strongly agree ■ Agree ■ Neutral ■ Disagree ■ Strongly disagree

Categories (top to bottom):
- Align teams around a common mission
- Discover new products or strategies
- Enable business growth
- Gather more diverse ideas and opinions
- Get buy-in from leadership
- Implement business or product strategy
- Improve customer experience
- Improve employee experience
- Improve internal collaboration
- Prioritize business or product strategy
- Prioritize good ideas versus top-down initiatives
- Run projects more efficiently
- Understand customers better
- Understand employees better

X-axis: Percent of respondents (0% to 100%)

Respondents were also able to identify direct, measurable business, and financial outcomes such as the following:

› The clearest financial impacts were achieved by eliminating waste and streamlining processes, with elimination of redundant processes achieved by 50% of respondents and elimination of unnecessary features, products, or services achieved by 47%. This was accompanied by an increase in employee productivity (experienced by 37% of respondents), streamlined processes (32%), reduced or reallocated headcount (28%), and reduced overhead (23%).

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› Faster processes resulted in faster time-to-market (experienced by 35% of respondents), faster/more efficient consensus building (28%), and a variety of reductions in effort for development, project management, and QA/testing experienced by 18% to 13% of respondents.

› These improvements were tied to an increase in employee engagement and improved employee satisfaction scores experienced by 33% and 13% of respondents respectively.

› Customer engagement was improved for 43% of respondents, along with increased sales (28%), customer productivity (23%), customer life-time value (22%), and customer experience scores (20%).

The complete list of outcomes reported by respondents is shown here:

Which Outcomes Have You Actually Achieved As A Result Of Design Thinking?		
RANK	OUTCOME	% OF RESPONDENTS REPORTING EACH OUTCOME
1	Elimination of redundant processes across teams	50%
2	Elimination of unnecessary features, products, or services	47%
3	Increased customer engagement	43%
4	Improved employee productivity	37%
5	Faster time-to-market	35%
6	Increased employee engagement	33%
7	Streamlined processes	32%
8	Increased number of customers	30%
9	Faster/more efficient consensus building	28%
10	Increased sales	28%
11	Reduced or reallocated headcount	28%
12	Improved customer productivity	23%
13	Reduced overhead	23%
14	Increased customer life time value	22%
15	Improved customer experience scores	20%
16	Reduced development effort for an equivalent or better outcome	18%
17	New discoveries or revised business strategy	18%
18	Reduced project management effort for an equivalent or better outcome	17%
19	Reduced number of development cycles for an equivalent major release	15%
20	Reduced QA and/or testing effort for an equivalent or better outcome	13%
21	Shorter/faster development cycles	13%
22	Improved employee satisfaction scores	13%
23	Reduced expenses with third party providers	13%
24	Reduced number of defects per development cycle	12%
25	Reduced development efforts due to architecture standardization	5%

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Perceptions And Looking To The Future

Survey respondents shared similar understandings of design thinking, albeit with varying jargon. Their perceptions were highly positive, muted only by the challenge of building sustainable adoption within their organizations. It takes significant time and effort, especially without the help of a partner like IBM, to not only introduce design thinking to employees but to embed it to the point that it transforms culture.

› One highly mature respondent shared that, "Design thinking is a core pillar of our organization that we practice daily."

› Another has had successes, but shared challenges in extending design thinking across the organization, "The culture has not changed, but we are hopeful it will make a difference." Another shared, "A few ideas have been adopted here and there with minor cultural changes."

The impacts on how teams work was essential to success, as respondents described:

› "Collaboration has improved markedly" for one, while for another it "streamlines the way we do business to achieve cost efficiencies."

› Employees were empowered and energized, as one described, "Design thinking establishes much more ambitious goals but gives people the buy-in to accomplish them."

› Design thinking drove employees to do their best, "It makes people want to involve all stakeholders to develop a more effective product."

› Standardization of design, architecture, and processes were common achievements, as one respondent explained, "Design thinking enforces consistent behaviors to finding improvements and efficiency across all business lines."

These organizations are looking to the future with the goal of expanding and deeply embedding the practice of design thinking.

› One respondent shared, "We need to expand the practice deeper into our organization", while another recognized their current shortcomings, "Our company needs to achieve quantum leaps in fostering creativity."

› Organizations are turning to design thinking to improve product development, for "new products that leverage collaboration across divisions" and that "match our capabilities and customer needs."

Overall, respondents are looking to the future to extend initial successes with design thinking into a broad, sustainable practice across their organizations. Success in this initiative requires investment, and where possible, a sophisticated partner to encourage best practices. When looking to a partner, respondents pointed first and foremost to IBM.

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IBM's Client Journey

BEFORE AND AFTER THE DESIGN THINKING INVESTMENT

Interviewed Organizations

For this study, Forrester conducted interviews with four IBM Design Thinking clients. Interviewed clients include the following:

INDUSTRY	REGION & SIZE	IBM'S TEAM	DESIGN THINKING INVESTMENT	INTERVIEWEES
Health and human services	North America 25-50K employees	IBM iX	Successful releases in a cornerstone program sparked initiatives organization-wide	› Chief information officer › Director, business design
Financial services	Global $5-20B revenue 25-50K employees	IBM services	Conducting a major, executive-led organizational transformation after achieving impressive outcomes in several pilot projects	› SVP, technology services › VP, business technology › Product team manager
Financial services	Asia Pacific $1-5B revenue 5-10K employees	Cloud garage	Exceptional pilot team results led to major investment in transforming product and operations teams	› Director, digital products
Manufacturing	Asia Pacific $1-5B revenue 10-20K employees	Mobile solutions	Successful pilot sparked early-stage initiatives organization-wide	› Head of transformation › Innovation lead

Key Challenges

Interviewees identified key challenges holding back their organizations:

› **Projects were slow, frustrating, and employees were resistant to change.** The director of digital products at a financial services company shared: "It was mind boggling how slow we were. We used to need all of these one-on-one conversations with different business units, technical and operational reviews, and a huge series of handoffs." He continued, "In our traditional approach, we'd get halfway through a delivery cycle and come up with a better way to solve the problem, but people would defend their turf vigorously and refuse to change course." The impact on morale was significant, as he explained: "Frustration with executives at our company was at an all-time high due to costs and risks. Our processes had become so big, so risk averse, that even simple work took forever."

› **The 'No' culture held organizations back.** Some companies felt they were stuck in a rut, as one interviewee described: "We used to have a No culture where the objective of a good employee was to raise an issue that they saw and tell their manager, 'Hey, I think we got a real problem here.' The manager would reply, 'Well done, thank you for pointing that out, you saved us from making a big mistake.' Without any purpose or deliberate intent, we had a counterproductive, negative culture built around tiptoeing through a minefield. None of us looked around at the time to say, 'How much goodness are we taking out of what we do by trying to never make the same mistake twice?' We weren't part of the solution, and we weren't enjoying ourselves."

> "Our internal process had become too big and risk adverse. Even simple stuff took forever."
>
> *Director of digital products, financial services*

> "Constituents were asking for easier, more accessible services. We brought in IBM to help us eliminate redundant questions, empower front-line employees, and ultimately make the process better."
>
> *Director of business design, health and human services*

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> **Poor design resulted in diminished user experience, and ultimately, lost revenue.** One interviewee described how important it is to deeply understand users: "Customers can shop anywhere and do anything, and can change their mind in a second. The real value in design thinking is bringing their thoughts and feelings to the table so we can solve their problems and deliver a great experience."

Engaging IBM

The interviewed organizations engaged with IBM's Design Thinking practices as part of a variety of investments.

> **Organizations brought design thinking to a wide variety of teams and use cases.** As one financial services company described, "Design thinking isn't just limited to software. It's getting people together, doing collective problem solving, and having to explain your problems to people outside your realm. It makes the problem clearer for you and leads to new ways to look at it."

> **IBM demonstrated a nuanced understanding of client problems.** The vice president of business technology at a financial services company shared why they turned to IBM: "We presented our problem and what we're looking to do, and IBM showed that they really heard what our problem was. They grasped it early."

> **IBM delivered a sophisticated design thinking framework.** A director of digital products shared: "My team used a form of design thinking for years, so we weren't new to it when IBM came to us. We were skeptical it would be any different, but we gave them a shot and let them facilitate a workshop. What came out was remarkable — it knocked my socks off." He continued, "I have used design techniques, facilitators, and designers from various companies over the years. The quality of who IBM put on the ground and the difference that makes to the outcome is incredible. They really have blown me away."

> **Pilot successes led to larger engagements.** The innovation lead at a manufacturer described that, "This is the first time our organization was introduced to human-centered design, and we have committed to building it as a real capability across the organization." A financial services company similarly explained, "As a result of our pilot program's success, we entered into a two-year engagement with IBM to take their UX and design thinking resources into our organization to train our employees and stand up this capability across the entire company."

Key Results

The interviews and survey revealed that organizations achieved key results by engaging with IBM for design thinking engagements, such as:

> **Design better.** The head of transformation at a manufacturer explained, "It is important to be able to just think differently, look at a challenge differently, and really ensure that we bring the end user and the customer to the heart of a project."

> **Reduce risk.** This was essential to one financial services company: "You actually reduce risk with design thinking by validating your idea and whether the solution you build will actually hit the mark and solve the problem. With traditional techniques, you have much more risk of discovering necessary changes too late that end up costing a fortune."

"Other vendors tried to show us a solution right away, whereas IBM said, 'We're not even going to attempt to provide you a solution yet. We're going to go through the design thinking process to really understand what you need.'"

VP of business technology, financial services

"Long gaps between releases cause sizeable disappointment when users don't see features they really want, because they know how long it could be until the next release. We are faster by pairing design thinking with agile, so even if their need is not in the newest release, it doesn't mean it's far away."

Director of business design, health and human services

"Design thinking pays for itself before you've even started cutting code."

Director of digital products, financial services

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- **Slash time-to-market.** As the director of digital products for one financial services company described, "We developed a product using design thinking and had it in our customer's hands in under eight weeks. If we had used traditional techniques, we wouldn't have even finished the business requirements yet." He continued, "We are able to deliver so much quicker and cheaper with design thinking."

- **Cut costs.** For one financial services company, "If you compare the average design phase with design thinking to traditional techniques, you're looking at maybe $150K in costs instead of $300K or $400K — and there's no way we would get anywhere near the same outcome."

- **Streamline processes.** One interviewee described how significant even a single workshop could be: "We had a workshop with about 30 people and four facilitators and we discussed the biggest pain points in operations. The team sat around asking about each other's problems and if they'd thought about it in certain ways. We walked out of that workshop and a week later the team had taken all of the advice — they solved three or four of the biggest pain points they had in operations."

- **Energize employees and align teams.** Empowered employees work together to solve problems, as the CIO for a health and human services organization described: "We've been impressed how our groups came together, talked, and gave respect to each other's ideas and feedback. Design thinking has enabled us to bring together business and IT as one integrated team." Ultimately, this changes company culture for the better leading to higher workplace satisfaction.

- **Demonstrate project value.** As the vice president of business technology at a financial services firm shared: "We have to fight for funding every year. Design thinking gives us a great platform to fight for that funding, because we have something tangible, whereas most projects can't articulate what they're getting. We've been able to get executives to say, 'I'm not going to be the one to cut that project', which has allowed us to extend projects to really see the full value."

Modeling The Composite Organization

Based on the interviews, Forrester constructed a TEI framework, a composite organization, and an associated ROI analysis that illustrates the areas financially affected. The composite is representative of the four companies that Forrester interviewed and is used to present the aggregate financial analysis. The composite organization that Forrester synthesized from the client interviews has the following characteristics:

- Fortune 1000-sized global financial services enterprise with an estimated $2B in annual revenue and 3,000 employees. It offers 100 products to its customers and clients.

- The organization conducts a pilot design thinking project with IBM to redesign one of their key products with the goals of decreasing costs, improving speed, and ultimately driving increased profits.

- Successful completion of the pilot program leads the organization to expand the engagement to a myriad of projects in years 2 and 3.

- Leadership identifies design thinking as an opportunity to improve its business and turns to IBM for support. It begins a design thinking transformation by establishing a design team that partners with IBM to train employees, educate stakeholders, and ultimately advocate for a deep company-wide embrace of the design thinking framework.

"We brought IBM in for a pilot program — they demonstrated that design thinking was a faster and better way to align, vision, and deliver the MVP. We got our pilot from design to delivery in less than nine months, when most other projects take 18 to 24 months, or are never even completed."

SVP of technology services, financial services

"We turned to design thinking to remind our employees why they got in the game in the first place: to solve problems, and to see a smile on their customer's face."

Director of digital products, financial services

Key assumptions
Fortune 1000-sized global enterprise with $2 billion in revenue, 100 products, and 3,000 employees.

Success of a pilot project leads to 26 more projects and the beginning of a company-wide design thinking transformation supported by IBM.

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Per-Project Financial Analysis

QUANTIFIED BENEFIT AND COST DATA FOR A SINGLE PROJECT

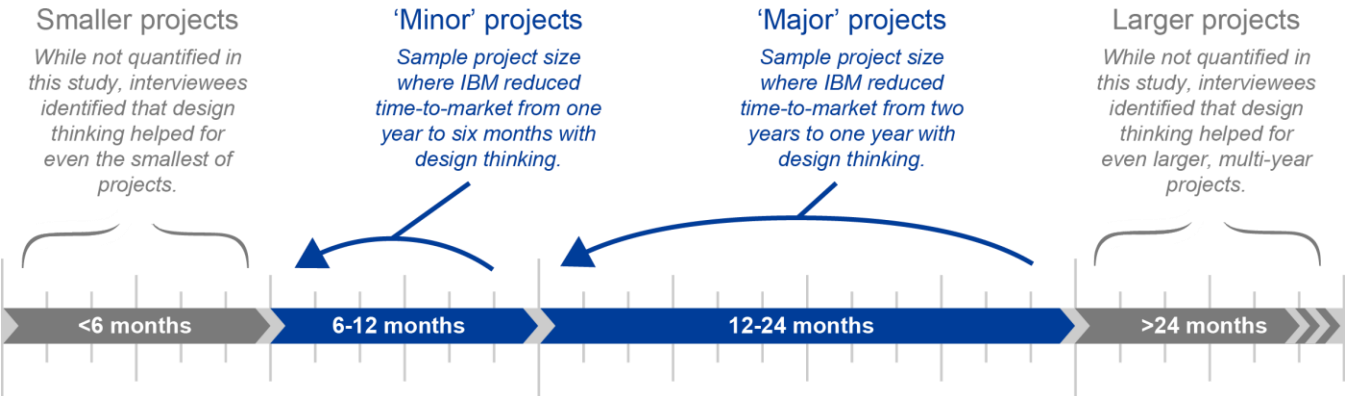## Benefits And Costs Of Leveraging IBM Design Thinking On A Project

REF.	BENEFIT	'MINOR' PROJECT	'MAJOR' PROJECT
PAt	Reduced design costs	$196,272	$872,325
PBt	Reduced development and testing costs	$222,783	$1,138,534
PCt	Reduced maintenance costs	$76,628	$153,255
PDt	Increased profit from faster time-to-market	$182,096	$1,050,240
	Total benefits per project (risk-adjusted)	**$677,779**	**$3,214,355**
	Design thinking costs per project (risk-adjusted)	($159,118)	($1,533,861)
	Net benefits per project (risk-adjusted)	**$518,661**	**$1,680,494**

Survey respondents and interviewees identified that design thinking slashed time-to-market by over 50% for a myriad of project types, such as software development, care giving, and go-to-market sales planning. Interviewees described that this impact held true across projects of all sizes, with scopes ranging from a two-person team for only one week to an ongoing three-year engagement. Furthermore, design thinking enabled flexible scalability of project scope and timeline to change based on information and strategy identified during the design process.

For this analysis, Forrester has demonstrated the impact of IBM's Design Thinking practice on a typical agile product development team. Readers should be aware that similar effects would apply to projects beyond product development. The impact has been analyzed for both minor and major scale projects based on the following assumptions:

Interviewees identified benefits from IBM Design Thinking for projects ranging anywhere from one week to three years.

Interviewees Engaged With IBM's Design Thinking Practice For Projects Of Every Size

Smaller projects

While not quantified in this study, interviewees identified that design thinking helped for even the smallest of projects.

'Minor' projects

Sample project size where IBM reduced time-to-market from one year to six months with design thinking.

'Major' projects

Sample project size where IBM reduced time-to-market from two years to one year with design thinking.

Larger projects

While not quantified in this study, interviewees identified that design thinking helped for even larger, multi-year projects.

| <6 months | 6-12 months | 12-24 months | >24 months |

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› **A minor project is typically built by a single team over 40 weeks and expects $2M in profits. IBM's Design Thinking practice enables them to reduce time to completion to only 20 weeks.**

- IBM conducts a three-day workshop paired with one week of accelerated visioning, and their work is the launching point for the problem statement, design collateral, and road map.
- The organization independently continues to leverage design thinking throughout the agile design and development process.
- The team is led by a product manager and includes 12 developers, four testers, two designers, and an extended 12-person cross-functional team. Not all team members are fully devoted to the project at all times, depending on project phase.

› **A major project is typically built by two teams over 100 weeks and expects $4M in profits. IBM's Design Thinking practice enables them to cut time-to-completion to only 50 weeks.**

- IBM conducts ten weeks of intensive user research, workshops, visioning, and designing that results in finalized road maps and design collateral.
- The organization continues to leverage design thinking throughout development with limited involvement from IBM.
- The teams are comprised of two product managers, 24 developers, four testers, four designers, and an extended 18-person cross-functional team. Not all team members are fully devoted to the project at all times, depending on project phase.

Please note that this case study leverages the terms "users" and "end users" to refer to either the customers or employees who will benefit from project completion. While every organization and project targets different audiences, the design and development processes share much in common. Therefore, for the sake of simplicity, the analysis in this study does not distinguish between the two.

'Minor' project:

- One agile product team.
- Expected profit of $2M.
- IBM conducts a three-day workshop and seven days of accelerated visioning.
- Reduces projected time-to-market from 40 to 20 weeks.

'Major' project:
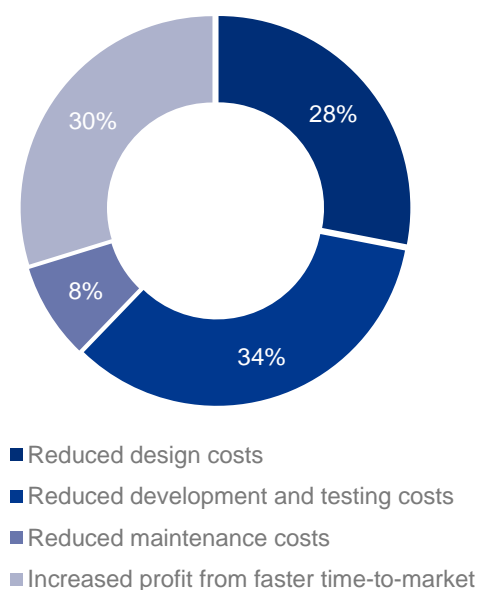
- Two agile product teams
- Expected profit of $4M.
- Engages IBM for 10 weeks of research and design.
- Reduces projected time-to-market from 100 to 50 weeks.

Per-Project Financial Analysis
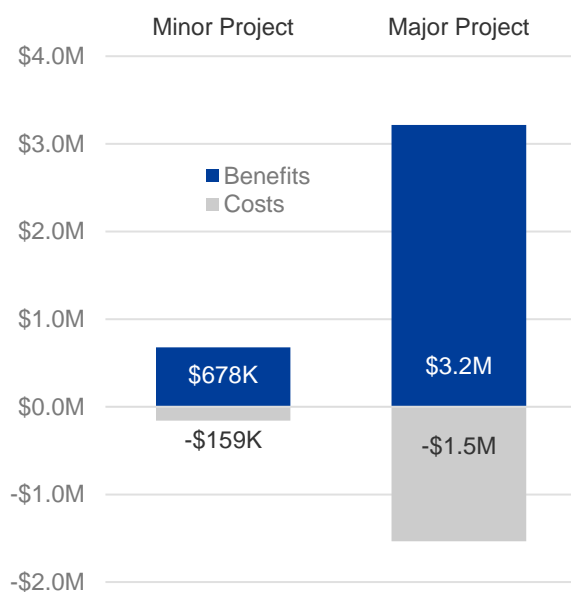
Per-Project Benefit Breakdown

- Reduced design costs
- Reduced development and testing costs
- Reduced maintenance costs
- Increased profit from faster time-to-market

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Reduced Design Costs

The clients interviewed for this study identified that IBM's Design Thinking practices were highly sophisticated, and that they were very successful in coaching and delivering excellent results.

› **IBM was essential to the process.** The vice president of business technology at a financial services company shared, "IBM doesn't just lead a workshop; they follow up and make it matter afterwards by bringing all the data and artifacts together in a concise, consumable way. Then, they keep us on track with multiple meetings a week to iterate and finish by creating a very detailed document of our vision, the problem statement, wire frames, and the development road map."

› **The results were impressive.** The director of digital products at a financial services company explained: "Collective problem solving is key to the value proposition of design thinking, and it's not just limited to software. By getting together and having to explain the problem to people outside of your realm, it becomes clearer and you're able to come up with better ideas. The output is just so much better."

› **Benefits from the streamlined design process alone outweighed costs.** As a financial services company described, "Even if you ignore the better ideas, better quality, and reduced risk of a failed project — it's a no-brainer. We can spend a quarter of the amount we used with design thinking to gather and agree on requirements. It saves hundreds of thousands of dollars for every project."

For the minor project considered in this analysis, the team reduces the time to gather and align on initial requirements by 75% — slashing their 16-week estimate to only four weeks. The impact on labor hours, and ultimately on reduced costs, was driven by the following assumptions:

› One product manager fully dedicated to the project, who earned a salary of $120K per year, plus a 25% burden rate.

› Four developers and two designers who were 50% dedicated to the project, and who earned $100K per year, plus a 25% burden rate.

› A 12-person cross-functional team of leadership, operations, IT, data, customer success, marketing, and sales. Each devoted one day per week at an average annual salary of $140K plus a 25% burden rate.

For the major project modeled in this analysis, the team reduces the time to gather and align on initial requirements by 75% — slashing their 40-week estimate to only 10 weeks. The impact on labor hours, and ultimately on reduced costs, was driven by the following assumptions:

› Two product managers fully dedicated to the project, who earned a salary of $120K per year, plus a 25% burden rate.

› Eight developers and four designers who were 50% dedicated to the project, and who earned $100K per year, plus a 25% burden rate.

› A 18-person cross-functional team of leadership, operations, IT, data, customer success, marketing, and sales. Each devoted one day per week at an average annual salary of $140K plus a 25% burden rate.

Forrester recognizes that every project is different, and IBM's impact may vary. Key risks or factors that may affect the analysis are as follows:

› Design costs will vary based on whether the project team is comprised of employees, IBM resources, a third party's resources, or a hybrid.
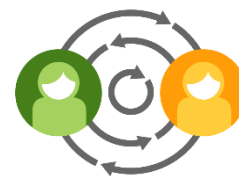
75% reduction
Time required to gather and align on initial requirements

$196,272 cost savings
For a minor project

$872,325 cost savings
For a major project

"Design thinking got everyone on the same page to agree on 'this is our vision, this is what we want.'"

Product team manager, financial services

"Even if you ignore the better ideas, better quality, and reduced risk of a failed project — it's a no-brainer. We can spend a quarter of the amount we used to with design thinking to gather and agree on requirements. It saves hundreds of thousands of dollars for every project."

Director of digital products, financial services

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> The number of staff, amount of time they dedicate, and their hourly pay will affect the weekly cost of design. The model assumes a typical agile product team structure, but other approaches may lead to variation.

> Total time to complete the design process, and consequently the amount of time saved with design thinking, will vary.

> Cross-functional participants, executives, or users could create scheduling delays that may extend the design time.

To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a risk-adjusted benefit of $196,272 for a minor project and $872,325 for a major project. Please refer to "Per-Project Benefit Calculation Table PA" in the appendix for complete calculation data.

Reduced Development And Testing Costs

Development and testing continues more quickly with better design materials and requirements fleshed out earlier. Rework is reduced due to the improved roadmap, and testing effort is reduced in the process.

> Involving development in the design process ensured benefits carried through, as the SVP of technology services for a financial services company described: "We have members of the agile development team work, learn, and listen at the inception of the discovery phase. This framework and the UX resources carry through into delivery to tie development, DevOps, and QA all the way to production."

> The director of business design for a health and human services organization shared the difficulty of changing course late in a project: "Before, we would get near the end of a release and realize what we built was not meeting our end users' needs. But by the time we would discover that, it would often be too late to conduct a change request."

For the minor project considered in this analysis, the team reduces the time for development and testing by one third — reducing their 24-week estimate to only 16 weeks. The impact on labor hours, and ultimately on reduced costs, was driven by the following assumptions:

> One product manager fully dedicated to the project, who earned a salary of $120K per year, plus a 25% burden rate.

> The organization fully dedicated 12 developers to the project, who earned $100K per year, plus a 25% burden rate.

> Four testers who dedicated two days per week to the project, who earned $80K per year, plus a 25% burden rate.

For the major project considered in this analysis, the team reduces the time for development and testing by one third — reducing their 60-week estimate to only 40 weeks. The impact on labor hours, and ultimately on reduced costs, was driven by the following assumptions:

> Two product managers fully dedicated to the project, who earned a salary of $120K per year, plus a 25% burden rate.

> The organization fully dedicated 24 developers to the project, who earned $100K per year, plus a 25% burden rate.

> Four testers fully dedicated to the project, who earned $80K per year, plus a 25% burden rate.

Forrester recognizes that every project is different, and IBM's impact may vary. Key risks or factors that may affect the analysis are as follows:

33% reduction
Time required for project development and testing

$222,783 cost savings
For a minor project

$1,138,534 cost savings
For a major project

"We are finding significant gains because we have a more solid design upfront, whereas we used to have a lot of late-breaking changes, throwaway effort, and rework."

Chief information officer, health and human services

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- Development costs will vary whether the team is comprised of employees, IBM resources, a third party's resources, or a hybrid.

- The number of staff, the amount of time they dedicate to the project, and their hourly pay will all affect the total weekly cost of development and testing. The model assumes a typical agile product team structure, but other approaches may also lead to variation.

- Total time to complete development and testing process will vary before and with design thinking.

- Time savings depend on the organization following the design and road map built with IBM's Design Thinking practice. Rework or scheduling delays could compound if development breaks from best practices or the recommendations of the design team.

To account for these risks, Forrester adjusted this benefit downward by 20%, yielding a risk-adjusted benefit of $222,783 for a minor project, and $1,138,534 for a major project. Please refer to "Per-Project Benefit Calculation Table PB" in the appendix for complete calculation data.

Reduced Maintenance Costs

No project is immune from launching with defects, but IBM Design Thinking can help reduce the number of user/customer experience or functionality issues that make it to launch. Better understanding of the user's needs helped clients design intuitively by mirroring the way users naturally act and delivering to them what they need. It's more expensive to redesign a project element after launch; by improving design, the organization reduces maintenance and support costs for each project.

- A health and human services organization slashed their number of design defects by well over 50%, by ensuring that they design the correct things up front. The CIO explained how this reduction in defects in turn reduced issue escalation: "We used to have daily meetings scheduled to handle escalations. By improving our offerings with design thinking and empowering employees to collaborate and solve problems on their own, those meetings decreased to three times a week, then once a week, and now they have all been cancelled - because escalations are almost nonexistent."

IBM Design Thinking helped projects deliver better usability and avoid launching with missing features. This led to reduced defects and subsequent rework, and has been modeled based on the following:

- The number of design defects is reduced by 50% per project.

- Minor projects see a decrease from 30 to 15 defects, while major projects drop from 60 to 30 defects.

- Each defect is assumed to take 100 developer hours to resolve.

- Developers earned $100K per year plus a 25% burden rate.

Forrester recognizes that every project is different, and IBM's impact may vary. Key risks or factors that may affect the analysis are as follows:

- Different types of projects may be more or less susceptible to defects.

- Total labor hours to fix an average defect will vary.

- Defects may not be reduced if development breaks from best practices or the recommendations of the design team.

To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a risk-adjusted benefit of $76,628 for a minor project and

50% reduction

Number of design defects

$76,628 cost savings

For a minor project

$153,255 cost savings

For a major project

"We reduced defects per release from 77 and 61 in our last two releases to only 26 defects in the most recent release with IBM."

Chief information officer, health and human services

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$153,255 for a major project. Please refer to "Per-Project Benefit Calculation Table PC" in the appendix for complete calculation data.

Increased Profit From Faster Time-To-Market

IBM's Design Thinking practice enabled organizations to reduce the time to complete the design, development, and testing processes — ultimately reducing time to market substantially. Reduced time-to-market leads to two types of positive business impacts:

› Increased present value of expected profits as profits can be invested at an earlier time for greater gains or increased business flexibility.

› Competitive market advantage leads to net new profits; with projects completed sooner, the company can beat others to market and ultimately increase adoption or incremental sales.

The interviewees and survey respondents for this study consistently identified benefits derived from faster time-to-market:

› The vice president of business technology at a financial services company shared that by, "by bringing together design thinking, agile, and research, we've been able to release our MVP faster and make it more valuable than it would have been otherwise."

› The director of digital products for a financial services company shared, "For one project, the business requirements document would have been around 80 pages and it would have required a team of four people working for an entire year to design, build, and test it. With design thinking, we had only two employees do the entire project and had it in the hands of the customer in only eight weeks."

This benefit has been modeled based on the following:

› Minor projects are expected to launch in 40 weeks and produce $2M in profits. By combining the time savings evidenced in the first two benefits of this study, the organization is able to reduce project completion time by 50% and launch in only 20 weeks.

› Major projects are expected to launch in 100 weeks and produce $4M in profits. By combining the time savings evidenced in the first two benefits of this study, the organization is able to reduce project completion time by 50% and launch in only 50 weeks.

› Twenty-five percent of profits are considered 'net new', as in they would never have been received if the project had been completed later. The remaining 75% of profits were received 20 weeks earlier on a minor project and 50 weeks earlier on a major project than expected.

› A 10% annual discount rate has been converted to a .19% weekly discount rate to measure the increased present value of profits.

Forrester recognizes that every project is different, and IBM's impact may vary. Key risks or factors that may affect the analysis are as follows:

› Expected profits and the timing of revenue will vary.

› External market factors such as other companies launching competing products may affect the amount of net new profits.

› Actual reduction in time-to-market will vary as previously discussed.

To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a risk-adjusted benefit of $182,096 for a minor project and $1,050,240 for a major project. Please refer to "Per-Project Benefit Calculation Table PD" in the appendix for complete calculation data.
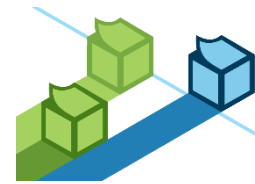
50% faster

Time-to-market

$182,096 in profit

For a minor project

$1,050,240 in profit

For a major project

"Our teams are getting more aligned and we're getting things done faster. We were looking at six to eight months per release, and now we're down to only three to four months."

Chief information officer, health and human services

"I took our company's portfolio and measured the steps in the development pipeline under traditional delivery techniques against the projects we ran with design thinking. The numbers were remarkable — teams using design thinking were 15 to 20 times faster."

Director of digital products, financial services

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IBM Design Thinking Costs Per Project

Organizations incur internal labor costs, workshop travel costs, and fees from IBM to conduct design thinking as part of a project. It is essential that design thinking permeates the entire process, as the SVP of technology services at a financial services enterprise explained: "It is essential to follow through — design thinking is great for visioning, but if you don't execute the project, you are promising your user something they will never see. You need to go end-to-end with the process, focus on delivery, follow up with the client, and iterate again."

This cost has been modeled for a minor project based on the following:

› The organization engages IBM for a three-day workshop paired with a one-week accelerated visioning program estimated at $50,000, similar to what a client of IBM's Cloud Garage practice may experience.

› A cross-functional group of 12 staff participate in a single three-day workshop, and are compensated at an average salary of $140K burdened at 25%.

› Six employees per workshop incur average travel costs of $1,000.

› Workshop scoping, scheduling, and logistics required 240 hours of project management labor with an average annual salary of $100K plus a 25% burden rate.

This cost has been modeled for a major project based on the following:

› The organization engages IBM for a 10-week accelerated visioning program, which includes user research, workshop facilitation, design and architectural resources, and creation of road maps and design materials. This is estimated at $600,000 and is similar to what a client of IBM Services or IBM iX may experience.

› A cross-functional group of 20 staff participate in three separate three-day workshops, and are compensated at an average annual salary of $140K plus a 25% burden rate.

› Ten employees per workshop incur average travel costs of $1,000.

› Workshop scoping, scheduling, and logistics required 240 hours of project management labor with an average annual salary of $100K plus a 25% burden rate.

Forrester recognizes that every project is different, and costs may vary. Key risks or factors that may affect the analysis are as follows:

› Project size, scope, and IBM practice will affect the total price. This cost does not include additional work beyond design thinking.

› The internal costs of workshops will vary based on the necessary logistics and the number of needed workshops combined with the number of participants, average salary, and travel requirements.

To account for these risks, Forrester adjusted this benefit upward by 10%, yielding a risk-adjusted cost of $159,118 for a minor project and $1,533,861 for a major project. Please refer to "Per-Project Cost Calculation Table PE" in the appendix for complete calculation data.

$159,118 in costs

For a minor project

$1,533,861 in costs

For a major project

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.

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Composite Financial Analysis

QUANTIFIED BENEFIT AND COST DATA AS APPLIED TO THE COMPOSITE

Total Benefits

| REF.	BENEFIT	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Atr	Faster project design and development	$3,214,355	$8,636,587	$14,058,820	$25,909,762	$20,622,415
Btr	Reduced risk and increased portfolio profitability	$0	$7,200,000	$16,800,000	$24,000,000	$18,572,502
Ctr	Streamlined organizational process efficiency	$0	$2,000,000	$10,000,000	$12,000,000	$9,166,041
	Total benefits (risk-adjusted)	$3,214,355	$17,836,587	$40,858,820	$61,909,762	$48,360,958

Faster Project Design And Development

The organization initially conducts a single, major pilot program with IBM in Year 1. This leads to quick growth as the organization undergoes a number of major and minor projects in years 2 and 3.

> One interviewee described how much their traditional techniques fall short compared to when working with IBM: "For one project, we recommended to a senior executive that we work with IBM to run a design thinking accelerated visioning program, but he balked at the price. He asked, 'Why would I spend that?' and suggested if we don't get anywhere, we could just try it later. But really, you can't come back to it. Design is the point in time when you're exploring an idea, and once staff is months into work, they don't want to question whether they're getting it right or wrong. They keep going even if they have to cover up problems. For this project, it's been over a year and we aren't in the marketplace — we are still doing business requirements, and we have a stressed team that feels like they are going nowhere. Everyone wishes we had just started with design thinking."

> One company introduced design thinking to bring life to a stalled project: "We were working to build a consistent design system for our products, but the work had faltered. We introduced design thinking and we have now completed MVP 1, 2, and 3 — and are working on the fourth release now. We now have a mature design framework for our development teams to refer to, which saves time, effort, and ultimately provides a consistent experience for our customers."

To measure the organization-wide impact, this category combines and scales the following per-project benefits discussed earlier in this paper:

> Reduced design costs of $196,272 per minor project and $872,325 per major project.

> Reduced development and testing costs of $222,783 per minor project and $1,138,534 per major project.

> Reduced maintenance costs of $76,628 per minor project and $153,255 per major project.

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 more than $48 million.

$20.6 million three-year benefit PV

43%
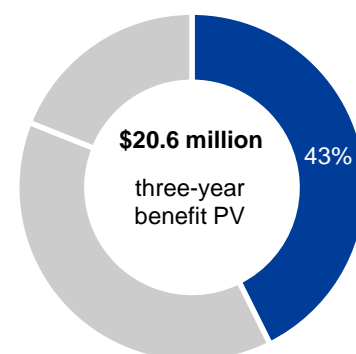
Faster project design and development: **43%** of total benefits

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- Increased profit from faster time-to-market of $182,096 per minor project and $1,050,240 per major project.

These benefits have been scaled with a phased rollout of IBM's Design Thinking practice across an increasing number of projects:

- A single, major pilot project is conducted in Year 1. This pilot program was the organization's first exposure to design thinking. As a result of the pilot's success . . .

- . . . the organization engaged with IBM to conduct one additional major project along with eight minor projects in Year 2.

- Successes accumulate, and the organization consequently invests in one additional major project and 16 minor projects in Year 3.

By the end of Year 3, the modeled organization has cumulatively completed three major projects and 24 minor projects in partnership with IBM's Design Thinking practices.

The combined benefit for all projects yields values of $3.2M in Year 1, $8.6M in Year 2, and $14.1M in Year 3 resulting in a risk-adjusted total PV of $20,622,415. Please refer to "Benefit Calculation Table A" in the appendix for complete calculation data.
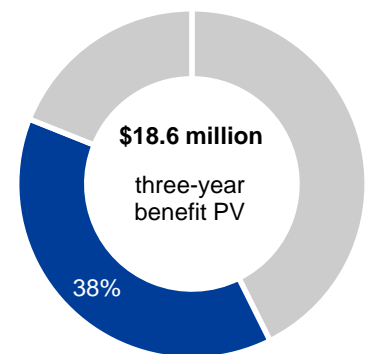
Reduced Risk And Increased Portfolio Profitability

Design thinking is about much more than reducing the time and cost of completing projects. It places users at the center of the design process to understand their problems and ensure that solutions are created that truly meet their needs. Ultimately, IBM's Design Thinking practice helped its customers to improve project outcomes in a myriad of ways:

- The director of digital products for a financial services company shared how IBM's Design Thinking practice enabled the business to approach a project completely differently, saving millions of dollars: "The company planned to build a solution that would change how one of our services was done, and it was going to take millions of dollars to build. We got together in a workshop facilitated by IBM and spent three days working on it and arrived at a completely different solution to minimize the cost and realize the value early."

- An interviewed financial services firm found that risk was dramatically reduced, as the SVP of technology services explained, "Using design thinking to collect user feedback combined with agile development lets you fail fast, whereas you could build a product for two to three years in a waterfall approach and have it fail because the market changed, and no one told you."

- Design thinking also helped ensure that valuable projects got the investment they needed. A vice president of business technology shared, "I believe our project's scope would have been cut in half without design thinking."

Forrester has modeled the business impact of IBM's Design Thinking practice across a company's entire product portfolio. With each year, an increasing portion of the company's portfolio will have been built using design thinking. These products outperform expectations, ultimately driving increased profit. Three primary factors contribute to this success:

- **Refine business strategy by discovering and investing in the projects that have the highest profit opportunity.** "Design thinking inspires different thinking, so you can invest in making a better result."

> "The savings we achieved through just one project paid for our entire two-year engagement with IBM."
>
> *SVP of technology services, financial services*

$18.6 million

three-year benefit PV

38%

Increased portfolio profitability:
38% of total benefits

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› **Minimize the risk of failed projects, or muted adoption, by weeding out poor investments that may not pay off.** One interview compared it to buying a car: "Seeing, touching, and feeling things reduces risk incredibly. It's the difference between buying a car online with a description but no photos, versus actually going to the dealership and doing a test drive."

› **Design better products that resonate with users to increase adoption, retention, satisfaction, productivity, and sales.** One financial services company described how important it is to deeply understand users: "Customers can shop anywhere and do anything and can change their mind in a second. The real value in design thinking is bringing their thoughts and feelings to the table so we can solve their problems and deliver a great experience."

Thanks to IBM's Design Thinking practice, the organization outperforms its traditional product portfolio expectations of $300M in profits by $9M in Year 2 and $21M in Year 3. The following chart illustrates the distribution of profits per product with traditional approaches (grey) and with IBM Design Thinking (green) as part of the portfolio. The shaded areas show cost savings from reduced risk (red) and increased profits from better design (green). The amount of profit contained inside those two areas is the total increase in portfolio profitability.

> "We planned to build a solution that would change how one of our services was done, and it was going to take millions of dollars to build. We got together in a workshop facilitated by IBM and arrived at a completely different solution to minimize the cost and realize the value early."
>
> *Director of digital products, financial services*

IBM's Design Thinking Practice Reduces Risk And Increases Portfolio Profitability

The increase in total portfolio profitability has been modeled using statistical distributions of expected profits versus achieved profits using the following assumptions:

› The organization earns $2B per year across a portfolio of 100 total products for an average per-product revenue of $20M. Products earn $3M in profits after a 15% profit margin.

› Product success normally varies along a bell curve:

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- Ten percent return no profit, or never make it to market.
- Twenty-five percent return half of the average profit.
- Thirty percent return average profit.
- Twenty-five percent return 50% more profit than average.
- Ten percent return double the average profit.

› Products that engage with IBM's Design Thinking practice experience better results on average, resulting in the following distribution:

- Two percent return no profit, or never make it to market (reduced risk).
- Fifteen percent return half of the average profit (reduced risk).
- Thirty percent return average profit.
- Thirty-five percent return 50% more profit than average (better products).
- Eighteen percent return double the average profit (better products).

› IBM Design Thinking is used to launch one product in Year 1, nine products in Year 2, and 17 products in Year 3 for a cumulative total of 27 out of an entire portfolio of 100 products.

Forrester recognizes that the impact of IBM's Design Thinking practice will vary for every organization based on the following risks:

› An organization's specific industry, products, and profit margins.

› The total size of an organization's product portfolio and the specific number and nature of products released leveraging design thinking.

› The exact ideas, strategy, and solutions created by an organization as a result of IBM's involvement, and the actual effect those design changes have on revenue as compared to business as usual.

› External market conditions that cannot be predicted nor controlled.

To account for these risks, Forrester adjusted this benefit downward by 20%. While no profit is yielded in Year 1, the organization received $7.2M in Year 2 and $16.8M in Year 3 for a three-year risk-adjusted total PV of $18,572,502. Please refer to "Benefit Calculation Table B" in the appendix for complete calculation data.

Streamlined Organizational Process Efficiency

All four organizations interviewed for this study were so impressed by IBM's Design Thinking framework that they immediately sought to employ it in teams and products across their organizations. Collaboration and efficiency was an essential theme; both interviewees and survey respondents agreed that one of the most important benefits of design thinking was that it energized employees and brought them together to collaborate — often for the first time. These employees shared their (and their team's) processes and learnings with each other, and this mindshare resulted in significant discoveries of ways to streamline their processes and to eliminate redundant work.

› The vice president of business technology at a financial services company shared: "Bringing design thinking to the whole company is a long-term project. In the first year, you're going to have this non-sexy foundational work that you need to be set up right before you really start reaping the dividends. Things really start to snowball because of a lot of the work that's been done already."

> "I have no doubt that design thinking has made our applications more intuitive."
>
> *Head of innovation, manufacturing*

19%

$9.2 million

three-year benefit PV
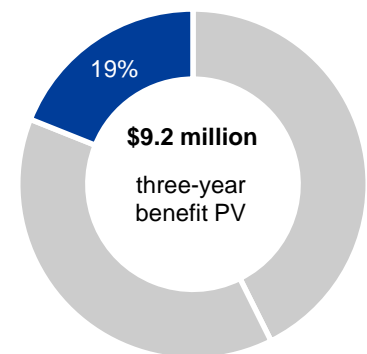
Streamlined process efficiency:
19% of total benefits

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- One interviewee described how significant even a single workshop could be: "We had a workshop with about 30 people and four facilitators and we talked about the biggest pain points in operations. The team sat around asking about each other's problems and if they'd thought about it in certain ways. We walked out of that workshop and a week later the team had taken all of the advice — they solved three or four of the biggest pain points they had in operations."

- Design thinking improved collaboration for one interviewee: "We're used to just handing work over the wall — but now we actually talk together."

Identifying redundant processes and streamlining others, represents significant cost savings for an organization. As the composite organization begins to undergo a company-wide transformation to embrace design thinking, its employees begin to uncover these opportunities for process improvement. Forrester has modeled the value of streamlining processes based on the following assumptions:

- Workshops, which are certainly not the only way to measure the collaboration opportunities that enable these efficiencies, were identified by customers as one of the clearest drivers of design thinking adoption. The composite organization conducts 20 cross-departmental workshops in Year 2 and 100 workshops in Year 3.

- For one out of every four workshops, at least one redundant process is discovered and eliminated for a total of five eliminated processes in Year 2 and 25 in Year 3.

- The value of each redundant process has been estimated at $500K, which is the equivalent to saving the work of four FTE's who are compensated at $100K per year plus a 25% burden rate.

Organizational transformation and improved process efficiency via collaboration will vary for every organization based on the following risks:

- The exact usage of design thinking varies. A financial services company interviewed for this study has rolled this out across a major team, describing: "We use design thinking in everything, but the magnitude ranges. Sometimes it's a workshop, sometimes it's just down at the work bench."

- A diverse selection of cross-functional participants in each workshop will help ensure that diverse ideas are discussed, ultimately driving an increased likelihood of identifying process improvements.

- Customers who identified these process improvements ranged dramatically in value, from small thousand-dollar savings to one that was identified as saving a whopping $25M.

- Leadership must actively fund and prioritize employee training and participation in design thinking collaboration and workshops. The findings must also be prioritized, and employees must be given the bandwidth and funds to design implement the new processes. Heavy workloads must not stand in the way of creativity and collaboration for benefits to be achieved.

To account for these risks, Forrester adjusted this benefit downward by 20%. Annual benefits start in Year 2 with $2M and $10M in Year 3, yielding a three-year risk-adjusted total PV of $9,166,041. Please refer to "Benefit Calculation Table C" in the appendix for complete calculation data.

> "We're used to just handing work over the wall — but now we actually talk together."
>
> *Chief information officer, health and human services*

> "We identified 'innovation catalysts' from throughout the business to train in a design thinking mastery program. They then go run workshops and share knowledge across programs to help it spread as quickly as possible. We've been able to expose over a third of our employees to design thinking in only half a year with this approach."
>
> *Head of innovation, manufacturing*

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Unquantified Benefits

IBM's Design Thinking framework enables organizations to achieve a host of benefits not quantified within this study, such as:

›   **Revitalize company culture and build an empowered, engaged, and happy workforce.** Happier employees can lead to improved retention, potentially reducing hiring costs and open headcount. Collaboration may lead to more cross-functional projects and internal development pathways or job transfers that can positively impact a company's intellectual and human capital. Organizations may also strengthen their appeal to potential candidates and referrals, enabling the hiring of higher quality candidates.

    • One interviewed company has begun measuring the impact of design thinking on employee satisfaction. As they described, "We have been measuring employee satisfaction with the new framework, and every response comes back as an eight, nine, or 10. One employee shared that 'I've worked here for so many years, and this is the first time I've been excited and engaged in a new framework — I feel like my opinion really counts.'"

    • Design thinking was a welcome departure from traditional techniques, as one interviewee explained: "Who likes writing and reading an 80-page requirements document? You end up just looking for negatives so you don't get kicked if you miss one, and you're glad to see the end of it. It's a really laborious and tiresome way of exploring ideas."

    • The director of digital products for a financial services company shared: "One of the great benefits of design thinking is that it really gets people to buy in. They feel like they're part of the solution, and because they have to immerse themselves in the workshop, they end up forgetting their other to-dos and really get into the question at hand. I've had people initially say they could only come for a couple hours but who end up attending the entire three-day session."

    • Employees may roll their eyes at first, but as an SVP of technology services described, that quickly changes: "People will walk into the meeting and expect to be put off by it — they expect design thinking to be just another feel good program that is ultimately a waste of time. But by the time they leave, they have had an epiphany."

›   **Enhance KPIs such as UI, UX, CX, NPS, and brand energy.** Better design and speed ultimately makes users happier, and therefore more loyal, more likely to recommend your products, and more likely to drive increased revenue.

    • The director of digital products for a financial services company described: "Design thinking helps us give great customer experience. Even little CX improvements are better than any advertising you can do because it builds advocacy. If your customers enjoy the experience, they come back, and they tell their friends about it."

    • The SVP of technology services for a different financial services company was not yet able to connect design thinking to these KPIs but hopes to, "We are working to measure the impact of design thinking on our Net Promoter Score and hope to see an increase."

> "IBM's Design Thinking practice transforms how our employees work and engage. We train them to work in an empathetic, client-centric way."
>
> *SVP of technology services, financial services*

> "Employees really appreciate seeing their own ideas and designs from design thinking sessions actually being built. They realize they didn't just go to a session, give feedback, and never see us again. They see their design in the system, which creates a lot of buy in and support."
>
> *Director of business design, health and human services*

> "Employee and customer satisfaction have enormously, enormously increased."
>
> *Director of digital products, financial services*

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- The impact was important to the constituents of one health and human services organization, "When users start to see that there's real change happening and that it is coming from their opinion, from their perspective, it makes a real difference."
- As the head of innovation for a manufacturer explained, "It's important to improve applications — not just to increase user productivity, but to make processes and systems that make sense and just work."

› **Perfect internal processes such as onboarding and employee training.** A financial services enterprise contends: "Design thinking isn't just for development. We are conducting workshops, trainings, and simple visioning exercises for teams in human resources, marketing, and even risk management. They approached us to try and improve their onboarding process, find new ways to measure risk, and even realign their organizations."

› **Increase the sales team's success rate.** Design thinking helped one financial services company earn business: "One customer turned to us over their normal partner because they liked doing business with us, it's more fun, and they believe in the products before we set out to build them. It was a proud moment for us."

Flexibility

The value of flexibility is clearly unique to each client, and the measure of its value varies from organization to organization. There are multiple scenarios, verticals, project types, and departments in which a client might choose to engage with IBM's Design Thinking practice and later realize additional uses and business opportunities, including:

› **Identify 'rising stars' who show promise due to their leadership, ingenuity, or proactiveness during the design thinking process — regardless of their official title.** These employees may not have a role that demonstrates these capabilities, but once they are in the collaborative environment, they may naturally step up as a leader when their job title is no longer an impediment to their authority.

› **Discover entirely new lines of business, reaching new customers with new revenue opportunities.** A CIO shared, "It's been good to just hear the pain points and needs from all the different areas. It allows us to think more out of the box."

› **Reduce future costs by reusing learnings and artifacts for future work.** Designs, personas, ideas, and other research discoveries can prove valuable across other projects and divisions. These learnings may even help to standardize design practices organization-wide. The CIO of a health and human services organization explained, "Design thinking helps us create personas and journey maps that, moving forward, will help our business and development teams get further down the line by reusing and rethinking these materials."

› **Extend design thinking across an organization.** A product team may engage IBM's Design Thinking practice for a product release, but afterwards, they may incorporate design thinking permanently within their process without requiring IBM's involvement.

› **Demonstrate project success to ensure they reach completion.**

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

> "One customer turned to us over their normal partner because they liked doing business with us, it's more fun, and they believe in the products before we set out to build them. It was a proud moment for us."
>
> *Director of digital products, financial services*

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.

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Total Costs

REF.	COST	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Dtr	Project design thinking costs	$1,533,861	$2,806,807	$4,079,754	$8,420,422	$6,779,274
Etr	Education & advocacy	$945,313	$2,050,744	$3,318,552	$6,314,608	$5,047,482
Ftr	Employee training	$28,346	$81,802	$166,531	$276,679	$218,491
	Total costs (risk-adjusted)	$2,507,519	$4,939,353	$7,564,836	$15,011,709	$12,045,247

Project Design Thinking Costs

Interviewees and survey respondents indicated that they conducted an initial pilot program, then extended the framework to more and more projects. Usage snowballed as successes accumulated.
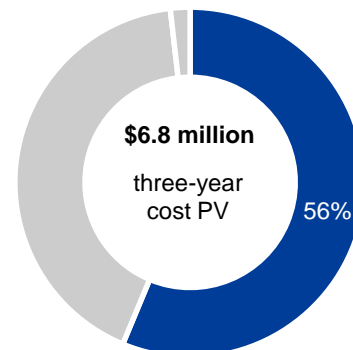
The per-project internal and external costs discussed previously in this report have been scaled with a phased rollout of IBM's Design Thinking practice across an increasing number of projects:

› A single, major pilot project is conducted in Year 1. As a result of the pilot's success . . .

› . . . the organization engaged with IBM to conduct one additional major project along with eight minor projects in Year 2.

› Successes accumulate, and the organization consequently invests in one additional major project and 16 minor projects in Year 3.

By the end of Year 3, the modeled organization has cumulatively completed three major projects and 24 minor projects in partnership with IBM's Design Thinking practices.

The combined cost for all projects yields a total of $1.5M in Year 1, $2.8M in Year 2, and $4.1M in Year 3 for a risk-adjusted total PV of $6,779,274. Please refer to "Cost Calculation Table D" in the appendix for complete calculation data.

Design Thinking Education And Advocacy

After being exposed to design thinking and a pilot success, the composite organization decides to invest in an organizational transformation with design thinking. The organization engages with IBM to help launch the initiative with best practices, provide necessary design resources, and support education and outreach within the organization.

› Success led to increased investment in design thinking teams, as described by a financial services company, "We started with a very small pilot team using design thinking techniques, but thanks to our success, it has grown to an almost 100-person team."

› The SVP of technology services at another financial services enterprise described their method for rolling out design thinking across the organization: "We created an enterprise framework on the corporate capability for design thinking. Much like a franchise, we encourage our business units to create their own design thinking groups as long as they meet our company-wide standards."

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 more than $12 million.
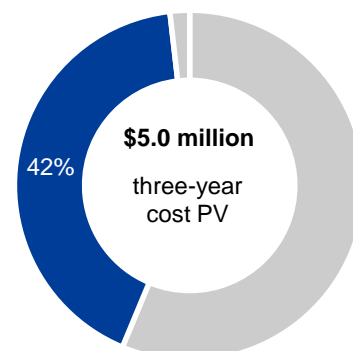
$6.8 million

three-year cost PV

56%

Project costs:
56% of total costs

$5.0 million

three-year cost PV

42%

Education and advocacy:
42% of total costs

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› This company also emphasized that design thinking is about much more than workshops: "We have had huge success with an ongoing 'Design Thinking Day'. Once every couple of weeks, the UX resources from our company and from IBM open up a conference bridge. Anyone can call in, ask questions, request advice, or share stories that might help others. We reserve meeting rooms across our locations for employees to come in, eat their lunch, and continue the conversation. Even employees that have worked here for decades meet for the first time and start collaborating to solve their problems."

Forrester has modeled the costs required to begin this organizational transformation based on the following assumptions:

› One executive leads the team, devoting 25% of their time in Year 1, 50% in Year 2, and 75% in Year 3 to the initiative. This executive is compensated at a rate of $250K per year plus a 35% burden rate.

› The organization dedicates 50% of the time of two, four, and six designers in years 1, 2, and 3, respectively, to the initiative. Designer compensation is $100K annually plus a 25% burden rate.

› The organization engages IBM for consultants, designers, and architects to support this growing transformational effort. These fees total $100K in Year 1, $300K in Year 2, and $600K in Year 3.

The internal effort and IBM resources required for education and advocacy will vary based on the specific needs of an organization.

› It requires investment, dedication, and time to spread, as a financial service enterprise's SVP of technology services described: "Design thinking is not something you bring in and turn on. It's a transformation in the way our employees work, talk, and collaborate. It's a huge change for people that are used to a stringent, siloed team."

› A director of business design shared a similar experience: "There was resistance in the beginning. Why fix what isn't broken? You can't shove design thinking down someone's throat. It took a lot of time for us as leaders to introduce it, talk about the value, help people along the way, and convince them to try the process."

To account for the risks of variance, Forrester adjusted this category upward by 10% for annual costs of $945,313, $2.1M, and $3.3M in years 1, 2, and 3, respectively. This yields a three-year risk-adjusted total PV of $5,047,482. Please refer to "Cost Calculation Table E" in the appendix for complete calculation data.

Design Thinking Employee Training

The composite organization engaged with IBM to help implement an internal education and badging program for design thinking. IBM worked with the organization's newly formed design team to help build out a version of this badging program, and then led a series of two-day workshops at one of IBM's global studios to train employees to become design thinking practitioners. After training, these employees are asked to stand up the design thinking framework within their respective teams and create a groundswell. Should employees be successful and continue to push design thinking within the organization, they have the opportunity to 'badge up' to become recognized for their efforts.

Forrester has modeled the cost of this program based on the following:

› IBM leads one two-day training workshop in Year 1, two in Year 2, and four in Year 3 — reaching eight, 32, and 64 employees respectively.

> "We recommend companies hire resources early, and engage them immediately to shadow IBM's Design Thinking work. Once they are trained, you bring them out into teams across the organization and bring a new batch of employees in for training. We made the mistake early on of not dedicating enough resources to design thinking. We would be further ahead if we brought these resources on sooner — lesson learned."
>
> *SVP of technology services, financial services*

$218,491

three-year cost PV
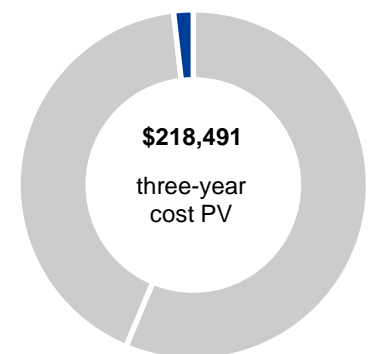
Employee training: **2%** of total costs

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- Participants earn an average hourly compensation of $140K plus a 25% burden rate, and a 3% annual raise.
- IBM charges $15,000 per workshop for planning, facilitation, venue, and associated badging support.

Forrester recognizes that training costs will vary based on the number of participants, location and associated travel, specific training needs, and the IBM fees required to meet those needs. Others may also choose to invest further than modeled, incurring additional training fees with the goal of accelerating organizational transformation.

To account for these risks, Forrester adjusted this category upward by 10%, yielding annual costs of $28,246, $81,802, and $166,531 in years 1, 2, and 3, respectively, resulting in a three-year risk-adjusted total PV of $218,491. Please refer to "Cost Calculation Table F" in the appendix for complete calculation data.

Two days of training to become a design thinking practitioner

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Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

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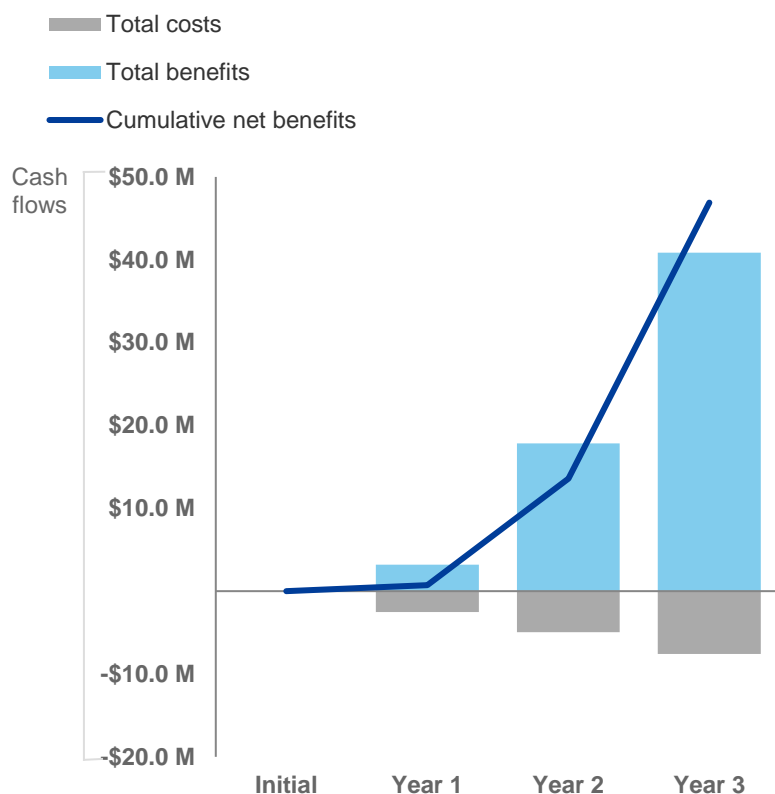
The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the composite organization's investment. Forrester assumes a yearly discount rate of 10% for this analysis.

- Total costs
- Total benefits
- Cumulative net benefits

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

Cash Flow Table (Risk-Adjusted)

	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Total costs	($2,507,519)	($4,939,353)	($7,564,836)	($15,011,709)	($12,045,247)
Total benefits	$3,214,355	$17,836,587	$40,858,820	$61,909,762	$48,360,958
Net benefits	$706,836	$12,897,234	$33,293,983	$46,898,053	$36,315,711
ROI					301%

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IBM Design Thinking: Overview

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

IBM Design Thinking

At the heart of the IBM approach to human-centered experiences is IBM Design Thinking: a framework to solve users' problems at the speed and scale of the modern digital enterprise. Whether re-envisioning the digital customer experience for a multinational bank or simply planning an upcoming product release, IBM Design Thinking keeps teams focused on what matters to users while guiding them from ideas to outcomes faster and more efficiently.

The Loop

Unlike other design thinking models that segment the different phases into a complex process, IBM Design Thinking is built on the model of a continuous and constant loop of activity. Teams **observe** their users in action, **reflect** and synthesize what they've seen, and quickly **make** a prototype of a better experience. A high-functioning team will always be moving through the loop of observe, reflect, and make. This simplified metaphor has helped teams new to the practice grasp and apply it with early success.

Cross-disciplinary teams engage in a series of collaborative activities such as Empathy Maps and Storyboards to better understand their user and envision the future experience. The low-fidelity artifacts generated during these activities form the narrative thread of their work and enable the team to quickly share ideas with users and stakeholders.

Diverse Empowered Teams

In IBM Design Thinking, the design of the team itself is important to achieving great outcomes, and two important factors are considered: diversity and empowerment. Design thinking teams at IBM must have a diverse composition of expertise, backgrounds, experience levels, gender, race, and age. These teams are equipped with the expertise and authority to deliver outcomes without relying on others for leadership or technical support. By pushing operational decisions down to the lowest level, teams have the ability to achieve rapid iteration as they move through the loop.

The Keys

In order to scale IBM Design Thinking across large geographically distributed teams, a series of tactics, known as The Keys, are applied. **Hills**, **Playbacks**, and **Sponsor Users** help teams align around a common user-centered purpose and maintain that alignment across a complex project. Hills are statements of intent written as meaningful user outcomes. Playbacks bring stakeholders into the loop in a safe space to tell user-focused stories and exchange feedback. Sponsor Users are real-world users that regularly contribute their domain expertise to the project, helping the team stay in touch with real users' real-world needs.

Restless Reinvention

"Everything is a prototype" is a common refrain for IBM Design Thinking teams. A reminder that, by continually iterating through the loop of observe, reflect, and make, they will always be moving toward great outcomes for their users and clients. Learn more about IBM Design Thinking at ibm.com/design/thinking.

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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.

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Appendix B: Calculation Tables

Per-Project Benefit Calculation Tables

			'MINOR' PROJECT	'MAJOR' PROJECT
PER-PROJECT BENEFIT CALCULATION TABLE PA: **Reduced Design Costs**				
REF.	**METRIC**	**CALC.**		
PA1	Expected weeks to gather and align on initial requirements		16	40
PA2	Weeks to complete process with IBM Design Thinking	75% reduction	4	10
PA3	Product managers involved in requirement gathering		1	2
PA4	│Hours per week dedicated per product manager		40	40
PA5	│Product manager hourly compensation (fully loaded)	$120K/year 25% burden rate	$72.12	$72.12
PA6	│Product manager savings per project	(PA1-PA2) *PA3*PA4*PA5	$34,618	$173,088
PA7	Developers involved in requirement gathering		4	8
PA8	│Hours per week dedicated per developer		20	20
PA9	│Developer hourly compensation (fully loaded)	$100K/year 25% burden rate	$60.10	$60.10
PA10	│Developer savings per project	(PA1-PA2) *PA7*PA8*PA9	$57,696	$288,480
PA11	Designers involved in requirement gathering		2	4
PA12	│Hours per week dedicated per designer		20	20
PA13	│Designer hourly compensation (fully loaded)	$100K/year 25% burden rate	$60.10	$60.10
PA14	│Designer savings per project	(PA1-PA2) *PA11*PA12*PA13	$28,848	$144,240
PA15	Cross functional team of leadership, marketing, sales, data, IT, operations, etc.		12	18
PA16	│Hours per week dedicated per team member		8	8
PA17	│Avg. team member hourly compensation (fully loaded)	$140K/year 25% burden rate	$84.13	$84.13
PA18	│Cross-functional team savings per project	(PA1-PA2) *PA15*PA16*PA17	$96,918	$363,442
PAt	Reduced design costs	PA6+PA10+PA14+ PA18	$218,080	$969,250
	Risk adjustment	↓10%		
PAtr	Reduced design costs (risk-adjusted)		$196,272	$872,325

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PER-PROJECT BENEFIT CALCULATION TABLE PB:
Reduced Development And Testing Costs

REF.	METRIC	CALC.	'MINOR' PROJECT	'MAJOR' PROJECT
PB1	Expected weeks for development and testing		24	60
PB2	Weeks to complete process with IBM Design Thinking	33% reduction	16	40
PB3	Product managers		1	2
PB4	⏐Hours per week dedicated per product manager		40	40
PB5	⏐Product manager hourly compensation (fully loaded)	$120K/year 25% burden rate	$72.12	$72.12
PB6	⏐Product manager savings per project	(PB1-PB2) *PB3*PB4*PB5	$23,078	$115,392
PB7	Developers		12	24
PB8	⏐Hours per week dedicated per developer		40	40
PB9	⏐Developer hourly compensation (fully loaded)	$100K/year 25% burden rate	$60.10	$60.10
PB10	⏐Developer savings per project	(PB1-PB2) *PB7*PB8*PB9	$230,784	$1,153,920
PB11	QA engineers		4	4
PB12	⏐Hours per week dedicated per QA engineer		16	40
PB13	⏐QA engineer hourly compensation (fully loaded)	$80K/year 25% burden rate	$48.08	$48.08
PB14	⏐QA/testing savings per project	(PB1-PB2) *PB12*PB13*PB14	$24,617	$153,856
PBt	Reduced development and testing costs	PB6+PB10+PB14	$278,479	$1,423,168
	Risk adjustment	↓20%		
PBtr	Reduced development and testing costs (risk-adjusted)		$222,783	$1,138,534

PER-PROJECT BENEFIT CALCULATION TABLE PC: Reduced Maintenance Costs

REF.	METRIC	CALC.	'MINOR' PROJECT	'MAJOR' PROJECT
PC1	Avg. number of design defects and issues requiring rework, business as usual		30	60
PC2	Reduced percentage of design defects due to IBM Design Thinking		50%	50%
PC3	Reduced number of design defects/issues requiring rework, with design thinking	PC1*PC2	15	30
PC4	Avg. number of developer hours to fix each defect		100	100
PC5	Developer hourly compensation (fully loaded)	100K/year 25% burden rate	$60.10	$60.10
PCt	Reduced maintenance costs	PC3*PC4*PC5	$90,150	$180,300
	Risk adjustment	↓15%		
PCtr	Reduced maintenance costs (risk-adjusted)		$76,628	$153,255

PER-PROJECT BENEFIT CALCULATION TABLE PD: Increased Profit From Faster Time-To-Market

REF.	METRIC	CALC.	'MINOR' PROJECT	'MAJOR' PROJECT
PD1	Avg. time-to-market, business as usual (weeks)		40	100
PD2	Reduced avg. time-to-market, with IBM Design Thinking (weeks)		20	50
PD3	Expected annual project profit		$2,000,000	$4,000,000
PD4	Total profit achieved faster	(PD1-PD2)* (PD3/52)	$769,231	$3,846,154
PD5	Percent profit only achieved with faster release		25%	25%
PD6	Net new profit due to faster time-to-market	PD4*PD5	$192,308	$961,539
PD7	Percent of expected profit achieved earlier with faster release		75%	75%
PD8	Weekly discount rate	10% annual discount/52	0.19%	0.19%
PD9	Increased net value of profit by launching earlier, per project	PD4*PD7* (PD8*(PD1-PD2))	$21,923	$274,038
PDt	Increased profit from faster time-to-market	PD6+PD9	$214,231	$1,235,577
	Risk adjustment	↓15%		
PDtr	Increased profit from faster time-to-market (risk-adjusted)		$182,096	$1,050,240

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Per-Project Cost Calculation Tables

REF.	METRIC	CALC.	'MINOR' PROJECT	'MAJOR' PROJECT
PER-PROJECT COST CALCULATION TABLE PE: **Design Thinking Costs**				
PE1	IBM's fees for user research, workshop facilitation, accelerated visioning, and project support		$50,000	$600,000
PE2	Number of workshops per project		1	3
PE3	Workshop length (hours)	3 days	24	24
PE4	Number of employee participants per workshop		12	20
PE5	Avg. hourly compensation of cross-functional participants (fully loaded)	$140K/year 25% burden rate	$84.13	$84.13
PE6	Internal employee participant labor costs per workshop	PE2*PE3* PE4*PE5	$24,229	$121,147
PE7	Number of employees requiring travel and accommodations per workshop	PE4*50% of participants	6	10
PE8	Avg. travel and accommodations cost per employee		$1,000	$1,000
PE9	Travel and accommodations costs	PE7*PE8	$6,000	$30,000
PE10	Hours of scoping, scheduling, and logistics per workshop		240	240
PE11	Avg. hourly compensation of administrative and project management staff	$100K/year 3% annual raise 25% burden rate	$60.10	$60.10
PE12	Hours of scoping, scheduling, and logistics to plan workshops	PE10*PE11	$14,424	$43,272
PE13	Internal costs for design thinking workshops	PE1+PE6+ PE9+PE12	$94,653	$794,419
PEt	Design thinking costs per project	PE1+PE13	$144,653	$1,394,419
	Risk adjustment	↑10%		
PEtr	Design thinking costs per project (risk-adjusted)		$159,118	$1,533,861

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Composite Benefit Calculation Tables

BENEFIT CALCULATION TABLE A: Faster Project Design And Development					
REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
A1	Number of minor projects working with IBM Design Thinking		0	8	16
A2	Number of major projects working with IBM Design Thinking		1	1	1
A3	Total reduced design costs (risk-adjusted by 10%)	$PAtr^{minor} * A1 + PAtr^{major} * A2$	$872,325	$2,442,501	$4,012,677
A4	Total reduced development and testing costs (risk-adjusted by 20%)	$PBtr^{minor} * A1 + PBtr^{major} * A2$	$1,138,534	$2,920,800	$4,703,066
A5	Total reduced maintenance costs (risk-adjusted by 15%)	$PCtr^{minor} * A1 + PCtr^{major} * A2$	$153,255	$766,275	$1,379,295
A6	Total increased profit from faster time to market (risk-adjusted by 15%)	$PDtr^{minor} * A1 + PDtr^{major} * A2$	$1,050,240	$2,507,011	$3,963,782
Atr	Faster project design and development (risk-adjusted)	A3+A4+A5+A6	$3,214,355	$8,636,587	$14,058,820

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BENEFIT CALCULATION TABLE B:
Reduced Risk And Increased Portfolio Profitability

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
B1	Total products supported by the business		100	100	100
B2	Number of releases using IBM Design Thinking	A1+A2	1	9	17
B3	Total products using IBM Design Thinking	B3^{PY}+B2	1	10	27
B4	Total products not using IBM Design Thinking	B4^{PY}-B3	99	90	73
B5	Avg. annual revenue per product		$20,000,000	$20,000,000	$20,000,000
B6	Profit margin		15%	15%	15%
B7	Avg. annual profit per product	B5*B6	$3,000,000	$3,000,000	$3,000,000
B8	⎸BEFORE — Number of product releases that return no profit or never reach market	10%	10	10	10
B9	⎸BEFORE — Number of product releases returning 50% less profit than avg.	25%	25	25	25
B10	⎸BEFORE — Number of product releases returning equal profit to avg.	30%	30	30	30
B11	⎸BEFORE — Number of product releases returning 50% more profit than avg.	25%	25	25	25
B12	⎸BEFORE — Number of product releases returning 100% more profit than avg.	10%	10	10	10
B13	Projected profit without using IBM Design Thinking in the product portfolio	B7*(B8:B12 * %Profit)	$300,000,000	$300,000,000	$300,000,000
B14	⎸AFTER — Number of product releases that return no profit or never reach market	2%	10	9	8
B15	⎸AFTER — Number of product releases returning 50% less profit than avg.	15%	25	24	22
B16	⎸AFTER — Number of product releases returning equal profit to avg.	30%	30	30	30
B17	⎸AFTER — Number of product releases returning 50% more profit than avg.	35%	25	26	28
B18	⎸AFTER — Number of product releases returning 100% more profit than avg.	18%	10	11	12
B19	Projected profit achieved using IBM Design Thinking in the product portfolio	B5*(B14:B18 * %Profit)	$300,000,000	$309,000,000	$321,000,000
Bt	Reduced risk and increased portfolio profitability	B19 - B13	$0	$9,000,000	$21,000,000
	Risk adjustment	↓20%			
Btr	Reduced risk and increased portfolio profitability (risk-adjusted)		$0	$7,200,000	$16,800,000

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REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
	BENEFIT CALCULATION TABLE C: **Streamlined Organizational Process Efficiency**				
C1	Number of cross-departmental design thinking workshops		0	20	100
C2	Probability of identifying a redundant process per workshop		25%	25%	25%
C3	Number of projects or processes eliminated due to redundancy	C1*C2	0	5	25
C4	Avg. savings per eliminated redundant process		$500,000	$500,000	$500,000
Ct	Streamlined organizational process efficiency	C3*C4	$0	$2,500,000	$12,500,000
	Risk adjustment	↓20%			
Ctr	Streamlined organizational process efficiency (risk-adjusted)		$0	$2,000,000	$10,000,000

Composite Cost Calculation Tables

COST CALCULATION TABLE D: Project Design Thinking Costs					
REF.	**METRIC**	**CALC.**	**YEAR 1**	**YEAR 2**	**YEAR 3**
D1	Minor projects using IBM Design Thinking		0	8	16
D2	Major projects using IBM Design Thinking		1	1	1
Dtr	Project design thinking costs (risk-adjusted by 10%)	$PEtr^{minor} *D1 + PEtr^{major} *D2$	$1,533,861	$2,806,807	$4,079,754

COST CALCULATION TABLE E: Design Thinking Education And Advocacy					
REF.	**METRIC**	**CALC.**	**YEAR 1**	**YEAR 2**	**YEAR 3**
E1	IBM's fees for design thinking education, advocacy, and support		$100,000	$300,000	$600,000
E2	Number of design thinking executive leaders		1	1	1
E3	Avg. annual executive salary (fully loaded)	$250K/year 3% annual raise 35% burden rate	$337,500	$347,625	$358,054
E4	Percent of executive time dedicated to design thinking		25%	50%	75%
E5	Cost of executive leadership	E2*E3*E4	$84,375	$173,813	$268,541
E6	Number of internal designers involved in facilitating and advocating design thinking		2	4	6
E7	Avg. annual designer salary (fully loaded)	$100K/year 3% annual raise 25% burden rate	$675,000	$695,250	$716,108
E8	Percent of designer time dedicated to design thinking		50%	50%	50%
E9	Cost of internal designers	E6*E7*E8	$675,000	$1,390,500	$2,148,324
Et	Design thinking education and advocacy	E1+E5+E9	$859,375	$1,864,313	$3,016,865
	Risk adjustment	↑10%			
Etr	Design thinking education and advocacy (risk-adjusted)		$945,313	$2,050,744	$3,318,552

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COST CALCULATION TABLE F:
Design Thinking Employee Training

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
F1	Number of internal staff taking part in design thinking training		8	32	64
F2	Avg. hourly compensation of cross-functional participants (fully loaded)	$140K/year 3% annual raise 25% burden rate	$84.13	$86.65	$89.25
F3	Number of hours for training		16	16	16
F4	Internal labor cost of training	F1*F2*F3	$10,769	$44,365	$91,392
F5	Number of training sessions led by IBM facilitators		1	2	4
F6	IBM facilitation fees per training session		$15,000	$15,000	$15,000
F7	Cost of IBM facilitation	F5*F6	$15,000	$30,000	$60,000
Ft	Design thinking training	F4+F7	$25,769	$74,365	$151,392
	Risk adjustment	↑10%			
Ftr	Design thinking training (risk-adjusted)		$28,346	$81,802	$166,531

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