

Innovation Passport

The IBM First-of-a-Kind (FOAK)
Journey From Research to Reality

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Foreword

Innovation has been and always will be all about generating new real value.

It has more to do with putting deep insights into problems and challenges—be they business, government, education, or societal—together in a unique and facile manner with your knowledge and technology to unlock hidden value.

The 21st Century has certainly demanded this type of innovation from us in less than its first decade. All the signs point to even more demanding times ahead. So much has changed in such a short period of time. So much more will change in an even shorter period of time. Our future success in delivering against our hopes and dreams, aspirations, and expectations will be tightly linked to our ability to innovate at an ever-increasing rate.

The good news is that we—each and every one of us—can. Increasingly, innovation is less about invention, creation, and discovery and more about what you do with your knowledge of the problem and its potential answers. The best environment to do this in turns out to be one that supports open, collaborative, global, and multidisciplined thinking and action.

IBM's First-of-a-Kind (FOAK) program did all this and more long before it was deemed fashionable, understandable, or desirable.

As a result of the deep customer intimacy and insight into problems and challenges this program afforded, the innovation unleashed so many of IBM's researchers with their deep knowledge, expertise, and technologies, which is nothing short of remarkable.

Right from the beginning, it was clear to me that this program would not only be good for our clients but equally good for our company. It is hard to argue with a program that generates value for both parties short term as well as long term. Supporting and funding this effort also helped me develop my own views of innovation here at the start of the twenty-first century. We used

these ideas and concepts to not only drive our company forward on its global agenda but also several economies of the world. In short, the FOAK program has been an amazing source of value, pride, and energy for the IBM company.

—Nicholas M. Donofrio
IBM Fellow Emeritus
IBM EVP Innovation and Technology (retired)

Preface

Collaborative innovation represents the best way forward, perhaps the *only* way forward, as we face the problems of the twenty-first century.

For the last 14 years, IBM has been exploring, developing, and extending one approach to collaborative innovation through the First-of-a-Kind (FOAK) program. Each project within the program brings ideas, technologies, and assets from IBM research to real-world problems and opportunities.

The scope of these projects is, by design, limited. Budgets are fixed. The duration of each is only a year, and the maturity of each innovation is such that milestones and deliverables can be defined before investment takes place. This is not to say that FOAK projects don't have their share of surprises, both good and bad. Any innovation project includes a level of uncertainty and risk. But FOAK is not about open-ended, blue-sky innovation.

Nonetheless, you'll find within this book examples that we hope will be informative and inspiring. We've learned a lot through the experience of FOAK, and many lessons, called out explicitly, might be more generally applicable to innovation programs. Finally, the challenges, discoveries, and insights from scores of projects have provided overall perspectives that might offer a reference point for critiquing or designing collaborative innovation programs across the spectrum of creativity and engagement.

Primarily, this book is intended for people who are involved in collaborative innovation. Those who plan and manage programs should find examples, guidance, and cautions. Those who participate should see some of the factors that are critical to success. There is also a point of view that innovation is a social activity and that success depends on communications that are systematic, empathetic, and focused. The excitement of discovery and rapidly evolving challenges seen by innovators make it easy to shortchange partners. But explaining, updating, consulting, and reminding partners of all sorts—

including those who will turn prototypes and early applications into broadly adopted offerings—is as essential as getting the numbers right, combing out bugs in a program, and integrating new applications into systems.

Besides collaborative innovators, our hope is that people will read this book to get a new perspective on how innovation might be made available to solve problems for businesses, governments, and nonprofits. We've peppered the text with mentions of specific projects with the hope that the broad scope of possibilities will become evident. And because it is often business leaders, administrators, and politicians who need to be engaged as full partners if innovations are to deliver on their promises, we hope that the information in these pages will help ready a wide variety of professionals to more effectively engage with the researchers and developers with whom they will need to collaborate.

This book is primarily organized according to the journey a project takes, from working out the possibilities to market adoption.

Chapter 1, “A Program That Works,” provides a basic orientation to the program and some discussion of its origins.

Chapter 2, “The FOAK Process: Phase I,” presents an overview of the initial steps of the FOAK process. It describes individuals coming together to explore client needs or the possible uses of particular assets, gathering input and support across different organizations, and submitting a proposal. This chapter also defines and explains a number of the essential roles and teams that participate in the process.

Chapter 3, “How Ideas Take Shape,” gets specific about how the pieces of a strong proposal come together, refined by teams with different perspectives and reformulated to fit real-world opportunities and needs.

Chapter 4, “Getting the Most out of Partnerships,” focuses on a major theme of the book—building relationships and commitment with a variety of stakeholders.

Chapter 5, “Choosing the Best Projects,” describes the criteria for selecting projects for funding. It illustrates how proposals are investigated and explored, with an eye toward improving their odds of success.

Chapter 6, “The FOAK Process: Phases II and III,” concludes the overview of the FOAK process. It describes project approval, engaging partners, execution, completion, and commitments that lead to marketplace adoption as products and services.

Chapter 7, “Clarifying Project Plans,” digs into the ways in which different entities establish both how they will work together and what they will do to execute a project effectively.

Chapter 8, “Ensuring the Work Gets Done,” details the sometimes difficult balancing act required for those who want to keep the flexibility needed

for new ideas and approaches with the hard-nosed structure needed to fulfill the commitments of an innovation program.

Chapter 9, “Telling the Story: IBM’s Industry Solutions Labs,” goes into an area that is often overlooked in innovation books—the promotion of the results. While IBM presents the results of FOAK projects in many ways, here the focus is on one channel—the Industry Solutions Labs. It provides a number of concrete examples of the elements of successful promotion, including audience analysis, development of demonstrations, and clear articulation of value propositions.

Chapter 10, “Portfolio Management,” provides a program-wide view of FOAK. It emphasizes trade-offs, maintaining support, and keeping the overall balance of projects vital and relevant.

Chapter 11, “Contracts and Intellectual Property,” answers some of the questions about how different organizations make legal commitments that reduce the possibility of misunderstanding and make explicit how investments, work, and benefits will be shared.

Chapter 12, “A Guide for Creating Innovative Programs,” abstracts and generalizes the experience of FOAK. The aim is to provide innovators at any organizational level with a reference that can be used to explore possible models or to validate the completeness of an existing collaborative innovation approach.

Chapter 13, “The Future of Collaborative Innovation,” looks toward some of the dramatic changes that will create new options and challenges for those who are looking to partner for innovation.

To set the work in context, this book also includes some of the history of FOAK and a viewpoint on the future of collaborative innovation.

Day to day, FOAK continues to evolve. Any program needs to be flexible and open to new possibilities in a world that, at times, can be altered dramatically by new technologies, economic tsunamis, emerging business models, political surprises, and the changing roles of users, customers, and citizens. In addition, we’ve found that discussions of collaborative innovation have become richer and more informative as we’ve reached out more broadly to validate and explore the ideas in this book. With this in mind, we’ve established a Web site at www.ibm.com/research/FOAK so you can stay up to date on the challenges FOAK takes on and the paths to success it discovers. We also hope to have rich conversations with you if you have questions or if you want to share your own experiences and perspectives. Toward this end, we’ve also created a blog at <http://innovationpassport.blogspot.com/>. We hope you can join us there.

Introduction

Innovation is a social activity. Without advocates, builders, critics, and developers, even the best ideas have no impact. Thomas Edison tacitly admitted this when he swore he'd never invent anything for which a market did not exist. Look at any innovation, and you will find partnerships, teams, and communities that worked together to realize the value of an idea or cluster of ideas.

The challenges of keeping an original idea alive and shepherding it along the full path to becoming a new product, service, or business model become more daunting every day. The greatest opportunities and the most urgent needs tend to be complex and work only within larger contexts. Many of the best ideas need to operate across different disciplines, industries, cultures, legal systems, and geographies.

If you invest time and resources in innovation for competitive advantage, higher margins, and the creation of new markets, meeting the new standard is difficult. The demands include the following:

- Looking more broadly at emerging opportunities
- Engaging in productive discussions with people who have different perspectives and needs

- Creating options that allow the sharing of benefits between organizations that traditionally have not worked together
- Coming to an understanding between the participants about the project's goals, its basic approach, and the value sought
- Agreeing on roles, responsibilities, and conditions of satisfaction against a matrix of rules, contracts, and laws that have their own histories and requirements

All of these challenges must be met in a consistent manner that delivers results regularly and quickly enough to provide real business benefits. Ideas must enter the pipeline, be evaluated, be acted on, and deliver on promises to the participants, time after time. Above all, communications need to be effective, and relationships must be maintained despite different points of view, enterprise requirements, cultures, and values.

IBM's First-of-a-Kind (FOAK) program has been at the leading edge of collaborative innovation for over 14 years. Each project has attempted to bring together the best of IBM to a creative client to produce real value for both partners. Together, IBM and its clients have experienced significant accomplishments, including finding ways of providing information for healthcare without compromising patient privacy, providing real-time speech translation capabilities to U.S. troops in Iraq, and driving down the cost of electricity by adding intelligence to power grids.

Scores of projects have achieved their objectives, both in terms of providing value to the partner and in terms of building stronger relationships between IBM and its clients. The operational scope of these successes in collaborative innovation is notable. Consider the following:

- IBM collaborated with clients in 17 different industries, including banking, retail, insurance, aerospace, automotive manufacturing, consumer electronics, and pharmaceutical. There were also more than 30 projects in the public sector.
- The size of clients ranged from small nonprofits such as the Department of Environment, Parks Canada Agency's Alexander Graham Bell National Historic Site of Canada in Nova Scotia to consortiums such as the Middle East Consortium on Infectious Disease Surveillance (MECIDS),¹ to large enterprises with huge market valuations such as TD Bank Financial Group, with over CDN \$500 billion in assets.²
- FOAK projects brought together team members from numerous countries. All the IBM Research labs—in Switzerland, Japan, Israel, India,

China, and the U.S.—have contributed to FOAK efforts. And in recent years, the portfolio of projects has spread investments across continents: 46% in North America, 33% in Asia Pacific, and 21% in Europe.

Overall, IBM and its clients have completed over 250 projects, but not all have been successes. FOAK has had a fair share of missteps, misunderstandings, and projects that have just plain failed to launch. The problems have come from either side or both—or even from changes in circumstances in a rapidly evolving business climate. Sometimes, those on a project just drew the short straw. After all, innovation is an inherently risky business. Over the years, IBM has learned its lessons in collaboration the hard way, and we will share those with you in this book.

These collaborations faced demands not just in bridging the differences between IBM and its clients, but in getting organizations within IBM, and within clients, to work together effectively. While IBM has taken on technical and business challenges, it is the range of *cultural challenges*—in communications, values, leadership, and relationship building—where we probably have the most experience and knowledge to share. The sheer variety of opportunities and hard-won know-how has allowed IBM to evolve guidelines and advice that we hope will provide real benefit to those who are attempting to build more effective and constructive collaborations for innovation.

Finally, IBM has the examples. Seeing how insights in the lab get tempered by the reality of fussy users, hardheaded accountants, and ad hoc critiques will provide a reality check for those who have romantic ideas of lone inventors changing the world.

Who Will Benefit from This Book?

The new mantra of industry is “Everyone is an innovator,” but this book is not for everyone. The primary intent of this book is to share the experiences of IBM’s FOAK program with those who need to plan, manage, or participate in collaborative innovation projects so that they can take advantage of best practices we have found.

But we do hope that what we present here will be more broadly valuable so that those who are interested in emerging technologies, business trends, and examples of organizational behavior will also benefit from this book. We suspect that many of the practices we found to facilitate collaboration for innovation will also be applicable to those who are looking for ideas on how to team more effectively for other purposes,

including organizational change, building client relationships, and sharing business intelligence.

Overall, this book will serve those who are curious about the future and how it is created. In most circumstances, it is more hard work than magic, more listening attentively than getting your own point of view across, and more building relationships than putting together prototypes.

Part of the impetus for this book was to answer the questions IBM gets directly from clients as they visit our Industry Solutions Labs (our display facilities for work in emerging solutions and technologies) or as they talk to us about how IBM does innovation. Typically, people ask these kinds of questions:

- Where do the ideas come from, and how are they validated and developed?
- How does IBM justify its investments in innovation?
- How do you prioritize FOAK proposals?
- How do you work across boundaries of organization, culture, language, and time zones?
- How do you handle concerns about the ownership of intellectual property?
- How do you find and select partners?
- How do you initiate and manage a project?
- What are the key roles and responsibilities in your innovation projects?
- How do you keep partners engaged?
- How do you measure success?
- How do you get full value from what you learn on a FOAK project?
- How do you manage a portfolio of diverse, complex projects?
- What are your best practices?
- How do you showcase innovation?

Our focus is on FOAK, so we won't address these questions globally. However, much of what we have learned can be extended beyond FOAK, and our hope is that these lessons can be adapted by many organizations that want to take the next step in innovation, bringing complex new solutions to the marketplace.

Our Approach

For many, the most interesting books on innovation are those that tell the story of how people came together to change the world, worked through all the obstacles, and ultimately triumphed. These heroes' tales can be engaging and inspiring, but they require a lot from any reader who wants to extract practical information.

IBM has heroes in the FOAK program and more than a few tales, but these did not become the basis for organizing the book. For one thing, we are not talking about a single success, but a series of successes that continue to this day. For another, we want to make this a useful document. We'll call out as lessons those best practices and processes that help ensure that FOAK remains ambitious, relevant, and productive. In many cases, these can easily serve as reminders or be adapted by other innovation initiatives.

However, recounting best practices and processes becomes meaningful only if they are tied to the critical success factors for innovation. Therefore, this book is centered on six key activities:

- Finding ways to clarify goals so that all participants understand why they are investing their time, ingenuity, and resources
- Systematically building trust and commitments between participants so that they give more than is asked of them
- Creating value propositions that resonate with all participants
- Creatively taking on the common obstacles of logistics, funding, failure, prioritization, and organizational loyalty that can derail the most promising projects
- Responding to change that inevitably emerges as the real world and the unexpected intrude upon well-defined processes
- Sharing success in fair and generous ways so that today's project experience inspires tomorrow's innovation

Chapter 1, "A Program That Works," provides an overview of the program's origins and development. This allows us to present historical context clearly while showing our evolution toward the practices we espouse. We believe this is a useful but not essential conceit. The chapters are written in a way that allows them to be read out of sequence by people with specific needs and interests.

We have highlighted advice and guidance throughout the text. We bring this all together in Chapter 12, “A Guide for Creating Innovative Programs,” with hope that it will become a mini-handbook for innovation teams.

Finally, we must concede that this story continues. Those of us involved in FOAK are still learning new lessons, and the ever-changing world presents new challenges with each project IBM initiates. Chapter 13, “The Future of Collaborative Innovation,” looks at the open questions, the unsatisfactory answers, and the indications of emerging requirements for success in innovation. We hope this chapter will become a starting point for continuing the conversation in the blog that is associated with this book, <http://innovation-passport.blogspot.com/>.

Endnotes

1. IBM press release: “New Data Sharing Technology Speeds International Collaboration to Identify and Respond to Infectious Diseases,” June 2, 2008.
2. Source: <http://www.td.com/profile.jsp>.

I

A Program That Works

If you were tripping over uncut jewels and precious metal ores, you'd probably find a way to take advantage of it. IBM Research can feel like that some days. In the hallways, you hear conversations about computers that understand natural language, advanced analysis of streaming data, or “green” ideas for reducing power and waste. Around you are people who think for a living, hard at work—taking on intractable problems of securing bank records during disasters, optimizing supply chains, or building systems that can simulate drug interactions. Good things are happening. Exciting things.

But for years, reaching out to the real world for innovation partnerships was not an obvious choice for IBM Research. IBM has always had good, inventive minds at work, helping clients and creating the next generation of essential tools for business and the public sector. But IBM kept the jewels to itself. Researchers (that specialized role emerged in 1945) labored in what seemed to be splendid isolation. They managed to invent the disk drive, random-access memory, FORTRAN, RISC computing, and dozens of other technologies that helped create today's digital world.

Not incidentally, IBM made a lot of money during this period. IBM had first-class questions it needed to answer, and it did not need to look outside for expertise. Almost everything was proprietary, and everything that was needed for a complete solution happened within the company. Besides, IBM Research was modeled after Bell Labs, and the perception was that splendid isolation was both appropriate and necessary. The real world, with its budgets, deadlines, and messy problems, would only distract the best and the brightest. Naturally, there *were* ideas, problems, and relationships that kept IBM Research relevant. It wasn't a completely closed system, but that was the basic perspective.

Research Partners with the Rest of IBM

IBM Research had few formal ties beyond corporate headquarters until the 1970s. At that time, other IBM divisions were facing significant challenges, and they became restive about making contributions to IBM Research when they weren't getting any immediate benefits. In response to this, so-called "Joint Programs" were established. For the first time, other divisions of IBM, those that built and sold and struggled with client problems, began to directly impact the IBM Research agenda and its funding.

Rather than securing 100% of its budget through the corporation, now IBM Research was allocated only a portion of its annual funding. IBM Research needed to secure the remainder of its funding directly from the IBM brands. This was intended to align a portion of the research work with IBM brand strategies, while still providing IBM Research with the liberty to pursue pure, unconstrained exploration.

This funding model still exists today. Every year, each of the IBM brands allocates a portion of its budget to fund its Joint Program with IBM Research. For every dollar that a brand invests in its Joint Program, IBM Research matches it. This matching-of-funds approach has ensured that IBM Research focuses some of its work on areas strategic to the IBM brands. It also has provided an effective incentive for the brands to invest in their Joint Programs, because it is a mechanism for the brands to increase the number of people working on their products, while providing only half of the funding. Essentially, they get extra help at a discount rate.

With the advent of Joint Programs, a substantial and growing number of IBMers began to work shoulder to shoulder with colleagues from across IBM. The collaboration was deep, with brand division employees working at, and even directing, projects in the research labs. The responsibilities of researchers extended to the products themselves, and it was not unusual for the researchers to move their offices to a manufacturing or development site. And if a product did not come off the line with sufficient quality, or a client had a problem with an offering that a researcher had a hand in, that researcher could be called in. Firefighting and problem resolution became part of the job, and many researchers became familiar with the hotels in Burlington, Poughkeepsie, Endicott, Hursley, and Markham.

In 1993, IBM Research took another step toward becoming more externally focused with the introduction of the Services, Applications, and Solutions (SAS) program. SAS aimed to bring IBM Research expertise and technologies to a much larger number of clients who were struggling with business challenges that had no off-the-shelf solutions.

SAS recognized that researchers lived in the state of the art in many areas of science and technology. If they could apply the very best of what IBM Research had to real-world problems, they could drive significant value for clients and the IBM Corporation.

Beyond generating new revenue for IBM, SAS led researchers to confront many difficult business challenges. It also forced the researchers to think more deeply and creatively about the potential impact of their work beyond the laboratory. Looking back, one can see how SAS and the Joint Programs drove IBM Research to be more vital to IBM by guiding the researchers into areas that they might not have otherwise explored. Figure 1.1 shows the evolution of IBM Research from being internally focused to externally focused.

Although IBM Research didn't welcome these changes enthusiastically, the cloud had a silver lining. Beyond management questions and economic pressures, it became clear that more and more of the action was happening where people from different organizations worked together. Synergies, new perspectives, and fresh ideas drove advances such as parallel computing, object-oriented software, and everything that came with the advent of the Web. And with few exceptions, success in the marketplace depended on a complex array of partnerships. Today's competitor is always, potentially, tomorrow's collaborator.

Research Evolution

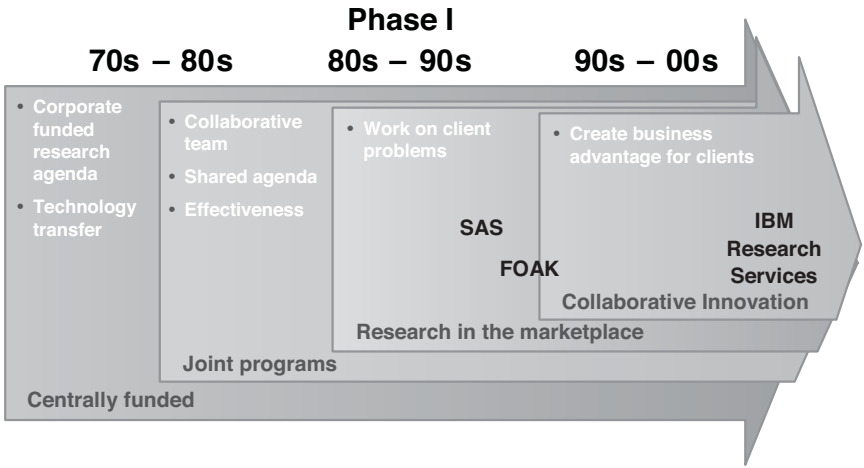


Figure 1.1 IBM Research goes from isolation to ever deeper partnering with other IBM organizations and clients.

IBM Creates FOAK

IBM’s First-of-a-Kind (FOAK) program (so called because each of its projects creates the first marketplace example of a technical asset’s use) was a natural outgrowth of the era and IBM Research’s interest in reaching out further. IBM funded FOAK in 1995 as a way to differentiate IBM’s solution offerings.

The very first FOAK, MedSpeak, was also the first commercially available continuous speech recognition application. A medical application seemed to be the perfect place to get going. Radiology reports are essential to patient care, but in 1995 they needed to be dictated to transcriptionists, typed, and returned for correction and signature. The process was expensive and time-consuming; it took 12 to 72 hours to turn around a report. Attempts to use existing, discrete transcriptions had failed because they were too awkward for most radiologists to adopt.

But what if an IBM Research asset, a continuous speech recognition engine, could be used to transcribe radiology reports? The MedSpeak

FOAK was set up to do just that. Furthermore, it made the asset more commercial-ready by building a prototype application. This ambitious project actually was done by working with three IBM clients to ensure that the asset and prototype would address real, important client pain points.

LESSON: Find a real need for innovation, and identify whose need is most acute.

Ultimately, MedSpeak became IBM MedSpeak/Radiology. It enabled radiologists to dictate reports directly and instantaneously into text and then correct, sign, and store reports for access by other physicians. The business value of this solution to the customer was fast turnaround of signed radiology reports and elimination or lowering of costs for transcription services. MedSpeak also garnered worldwide press coverage and accelerated IBM's development of continuous speech recognition.

But MedSpeak had an even more profound impact. It became a proof point for the whole idea of FOAK. With MedSpeak, the FOAK team was made up of researchers and contractors. When the FOAK project was completed, the contractors simply left IBM Research and moved with the technology to the delivery organization. MedSpeak demonstrated a new way to develop deep technical expertise on a solution and transfer it out of IBM Research.

With FOAK, IBM created a program dedicated to speeding the movement of great ideas and new technologies from the labs to the marketplace. This became a way for IBM, officially and systematically, to begin sharing the jewels with its clients. And, not incidentally, it has become a way to get these jewels out of the lab and provide value to IBM.

FOAK's Aim Is Leadership and Growth

FOAK has a 14-year track record of creating value. With, on average, 15 projects completed each year (out of about 20 to 25 approved for funding), FOAK successfully transfers assets for reuse from 70% of the FOAK projects completed.

In summary, the payoff for the partners working in this middle ground is the possibility of doing something that provides leadership and growth from the following:

- Early access to game-changing technologies
- First market adopter advantage
- Access to world-renowned researchers
- Skills and knowledge transfer
- Firsthand experience with emerging technologies and new business models
- Direct input into IBM's requirements process
- An investment funding model that minimizes the client's investment

IBM benefits from the following:

- Accelerated delivery of new technologies to the market:
 - New offerings
 - IBM Research Services engagements (described in Chapter 6, "The FOAK Process: Phases II and III")
 - Asset licensing
 - Enhancements to core technologies
- Accelerated solution sales:
 - References
 - Proof points
 - Reuse
 - Differentiation
- Linking IBM Research's strategic initiatives to real client problems
- Valuable experience and thought leadership
- Headlights into emerging market opportunities
- Mindshare in the innovation space

For these reasons, clients continue to line up to participate in FOAK projects, and IBM continues to provide the funding and strategic direction to make them happen.

The FOAK leadership (the FOAK Board, described in the next section) and the Program Management Team (described in Chapter 10, “Portfolio Management”) have identified many best practices. Some criteria—especially those for tying the projects to strategic objectives and ensuring client commitment—have become part of how FOAK does business. But all these areas continue to be under review. In fact, 2001 became a turning point for FOAK (as discussed later in this chapter). The need for change was raised because the FOAK Board did regular, systematic evaluations of how those participating in the program did the work. As opposed to many other innovation programs, the FOAK leadership sees FOAK as unfinished, with plenty of opportunities for improvement remaining.

FOAK Gets Systematic: The FOAK Board

Early FOAK projects provided a strong starting point, but not a finished model. For instance, initially IBM Research had many assets lying around that could be cherry-picked for “hardening.” This means taking a technology and providing the structure, training, and documentation needed for the technology to be used reliably in the marketplace. This availability of almost-ready assets couldn’t last, and a crisis of sorts occurred when less mature and visible assets became central to FOAK engagements.

It became clear that FOAK needed to include more development activities—especially alignment with markets and current offerings—during projects. Today, careful consideration is given to the state of the initial assets that become the core of the FOAK project to ensure that they can be implemented, enhanced, and extended within a 12-month time period, which is the typical duration of a FOAK project.

In addition, it became clear that too many projects failed because they were being approved without sufficient attention to clear goals and roles. The program also did not provide enough guidance to those who in many cases were not used to working with clients and managing those relationships. The early projects also showed common weakness in project management.

In 1999, the concept of having an overall governing body for the program to manage its investments and help alleviate pain points in the processes emerged. The FOAK Board (described in Chapter 5, “Choosing the Best Projects”) consists of a cross-IBM team of executives who meet quarterly to do the following:

- Review and approve investments
- Help innovation teams navigate obstacles
- Ensure that both IBM and its clients are realizing value from the program

Although the members change continuously, the concept of the FOAK Board and its purpose have remained consistent over the years.

Problems occurred on the client side as well. Clients are used to having IBM “jump” in response to their requirements. A FOAK is fundamentally different in that IBM pays the bulk of the bill and has an objective in mind that may not align perfectly with the client’s objectives. For example, with one FOAK, the Enterprise Portfolio Management Hub, the client wanted special adaptors built to interface with its tools. These were one-off solutions that IBM was not interested in building. It was just too big a job. Ultimately, the IBM Project Team had to reset the client’s expectations. A painful lesson was learned about the need to set expectations correctly from the beginning. This is discussed in more detail in Chapter 4, “Getting the Most out of Partnerships.”

LESSON: Set expectations with stakeholders correctly from the beginning, and then validate that those expectations are understood and accepted.

Setting client expectations goes well beyond the features and functions of a given FOAK project. Balancing the whole premise of exploratory prototypes versus commercialized offerings is difficult and continues to be a challenge for the program even today.

Retooling and Polishing the FOAK Approach

Although the FOAK program delivered value throughout its first five years of existence, the FOAK Board believed it could have an even greater impact on IBM and its clients. So in 2001, the program was reengineered to better align it with IBM’s solution strategy, link it to more strategic markets, improve its asset transfer rate, strengthen client commitments, and have a better means of measuring the program’s impact.

Alignment with the Solution Strategy

Part of the impetus for change came not from a realization that improvements were needed, but from a strategic change outside of FOAK. In the late '90s, IBM's solution strategy shifted away from building applications to one of partnering for applications. IBM wanted to provide industry-focused consultants and subject matter experts who could leverage the breadth of IBM hardware, software, and integration services. This meant that the types of assets being developed and tested on FOAK projects needed to shift as well.

Instead of large, application-based assets, IBM needed to invest in a wider variety of assets. Middleware, business models, methodologies, architectures (business, functional, and implementation), analytics engines, and more—extended by innovative technologies and thought leadership—became the focus of the program's investment strategy; it remains so today.

This fundamental shift from application-based assets to a broader range of assets being developed and piloted on FOAK projects cut the program's funding needs in half. In some ways, this enabled the program to survive during times when the company was focused on quarter-to-quarter financial performance.

In recent years, however, the focus has shifted back toward innovation and growing the FOAK program. This is supported by an almost 50% increase in FOAK program funding in recent years.

Linkage to Strategic Markets

Organizationally, the FOAK program is the teaming of IBM's research and sales divisions (Sales & Distribution (S&D)). This enables the sales teams to leapfrog IBM's traditional development cycle and helps guide research efforts toward strategic markets.

The value of S&D input was understood only over time. Prior to 2001, the majority of the FOAK projects presented to the FOAK Board were IBM Research-initiated, with limited involvement from the S&D industry teams. Yet S&D had a sophisticated market planning process in place to pinpoint strategic market segments likely to grow—something IBM Research did not have.

The FOAK Board wanted the IBM Research teams to leverage S&D's market planning process to ensure that the FOAK projects were well aligned with the industry-defined strategies and focused on their targeted market segments. This was a pivotal insight for FOAK, and drove greater value for S&D.

Today in the FOAK model, sales identifies strategic market segments and targets early-adopter clients and business partners to work side-by-side with IBM scientists, testing new ideas and innovative technologies. FOAK selects research that is too immature to be included in a brand product plan, but not so immature that it poses a substantial risk to the client's business. IBM funds researchers as they pilot their innovations in a real business environment. The FOAK client invests in the hardware, software, and services needed to fully participate in the project.

It might be surprising that a sales organization could have such interest in innovation and would provide funding and personnel to partner with a research organization. The personalities and values of sales and research typically don't intersect. Classically, the researcher is interested in satisfying curiosity, gaining the respect of peers, and doing something new. A sales person is interested in commissions, salary, and bonuses. Although these characterizations are a bit stereotypical, they contain enough truth to raise curiosity about why research and sales should work together.

The answer to why such different organizations choose to work together is one word: growth. For IBM, FOAK enables S&D to guide IBM Research efforts towards strategic emerging-market opportunities that sales people have identified as potential sources of new opportunity. IBM Research has an opportunity to create an organizational ally and demonstrate its contributions.

During the reassessment of FOAK, another practice was found to be ripe for change. Prior to 2001, the innovation teams tended to engage clients before they secured FOAK Board approval of their projects. The researchers believed that if they had a qualified client, their FOAK proposal would be stronger, and the risk of rejection would be minimized.

This practice often led to innovation teams securing FOAK clients who were in *nonstrategic* market segments, as defined by the industry's market planning process. This may have been fine for getting the project done, but it could be lethal to attempts at later asset adoption. Delaying such commitments and linking the FOAK program directly to the industry's market-planning process has better aligned it with S&D's strategies and has driven greater impact on the IBM Corporation as a whole.

LESSON: Find the sweet spot for your innovation program—what it can do that nothing else can.

Improved Asset Transfer

Once a FOAK project is completed, the intellectual property needs to be transferred to an owning organization, such as IBM Software Group, to enhance and commercialize the assets for broader market consumption. Prior to 2001, most innovation teams did not explore asset transfer until their projects were completed.

Asset transfer occurred too late in the overall FOAK project lifecycle to have an impact, because it provided little or no opportunity for the commercialization organization to understand the requirements or influence how the assets were developed. These asset *catchers*, as they are called in the program, are responsible for the assets' ongoing enhancement, maintenance, and support. These catchers can be in an IBM product brand organization, a services practice, or an external partner's organization.

Today, FOAK innovation teams must engage the targeted catching organization early in the process. They need to gain the organization's support and feedback on strategic and technical relevance to the catcher's future product plans. Beginning with the proposal phase, they actively discuss the project's merits with the potential catchers, and these relationships are nurtured throughout the project. And it doesn't end there. When a project is about three quarters of the way to completion, more detailed discussions occur about the actual plans for transferring each asset.

These early and regular discussions are crucial to ensuring the assets' broader market applicability. This up-front dialogue, coupled with the ongoing involvement of the catching organization in the FOAK projects, has proven to be widely successful in pushing the asset transfer rate of the FOAK program to 70%. It is important to note that this asset transfer rate is based only on projects that have successfully made it through the various project filters (described in Chapter 2, "The FOAK Process: Phase I") and the FOAK Board approval and the contract negotiation processes (described in Chapter 6).

Stronger Client Commitment

During the reevaluation of FOAK, another change was made, this one involving the client. When the FOAK program was introduced, projects were offered to clients for free. The thinking at the time was that, since IBM couldn't commit to a fully commercialized product at the start of the FOAK project, it shouldn't charge the client a fee for participation. But without a client's financial commitment to the FOAK project, it was often difficult for the FOAK innovation teams to keep the clients

interested in the projects' success. And upon completion of the FOAK project, it was virtually impossible to gain the client's commitment to fully deploy the solution.

The FOAK Board hypothesized that if the program had a more clearly articulated value proposition, the clients would be willing to invest—both financially and with in-kind resources, such as personnel, data, process, and user groups—to participate in a FOAK project. (The FOAK client value proposition is discussed in Chapter 4.) Today, a modest client investment is required to participate in the FOAK program. This improvement in approach over the last nine years has had a tremendous impact on the level of client involvement in FOAK projects and the overall value realized by both the clients and IBM.

LESSON: All key stakeholders need to have some skin in the game.

Measuring Impact

Finally, measuring the impact of an experimental investment program is difficult. The traditional approaches used to measure businesses with existing markets don't necessarily make sense for experimental, unborn markets. Yet the FOAK program needed a way to prove its value to and impact on IBM and its clients. In 2001, a set of standard metrics was established and a scorecard tracking mechanism was created to measure and track the portfolio's performance at a glance. Not only does the FOAK Board use these metrics to manage the portfolio, but they have become critical in keeping the program funded. FOAK program metrics are discussed in detail in Chapter 10.

FOAK Proof Points

The goal of FOAK is simple and has remained consistent since its inception in 1995: to deliver innovative technologies and thought leadership to the marketplace. By accomplishing this goal, the research labs at IBM can generate opportunities for growth for IBM and its clients.

Is it working? The question isn't academic. Investments, careers, and credibility are at stake. While FOAK is far from the only path for externally influenced innovation—acquisitions and mergers bring new

products and services into IBM and its clients' business regularly—FOAK is a serious initiative, intended to be an important route to innovation.

FOAK is an important bet from a public relations and client relationship point of view as well. If the program does not deliver thought leadership, the IBM brand—currently worth \$59 billion—is put at risk.

Finally, recognizing and acting on emerging opportunities and challenges is what creates the future. If FOAK does not provide a means of identifying, understanding, and responding to change in the world, IBM will not be taking advantage of the chances that come its way to develop and grow. FOAK itself continues to change, expanding the range of disciplines it involves itself with and reaching ever further into different organizations and cultures to find the best talent and ideas. For example, the program has seen a 60% increase in the amount of FOAK activity in the growth markets, reflecting the change in global markets, such as China and India.

Luckily, there is plenty of evidence that FOAK is working in an effective and productive manner. Here's a small sample:

- One FOAK project, MASTOR, achieved near-real-time translation for the military in combat zones. According to Admiral Edmund Giambastiani, Vice Chair of the Joint Chiefs of Staff, "This type of technology can help to improve communication for U.S. and coalition personnel with Iraqi citizens and aid organizations serving in Iraq."¹
- In the Middle East, a FOAK project is helping to better predict and avoid the spread of pandemics. Public Health Information Affinity Domain (PHIAD) is a standards-based, interoperable infrastructure that leverages IBM inventions to enable scientists and public health officials to query clinics, hospitals, lab systems, and other stakeholders for anonymous data, categorized by disease. They can then create and use models of infectious diseases to paint a picture of the health of a population with real-time information.²
- With end-of-life legislation and recycling requirements becoming effective worldwide, a Japanese automaker needed a better way to track parts from their creation to their ultimate disposal or recycling. Researchers worked with the firm to create a global parts traceability system framework and data architecture (TraceSphere) to enable distributed, accurate, and dynamic bill-of-materials tracking throughout the entire vehicle life cycle. As a result, the client can comply with new laws while reducing its manufacturing costs and improving quality levels and customer satisfaction.

Of course, the value provided to clients does not tell the whole story. IBM also benefits from the solutions it creates for its clients. For example, a scheduler that balances workloads and allocates resources for a bank can find uses in other firms. A framework that combines requirements for engineering, conceptual design, and analytical models for a carmaker may be beneficial for IBM manufacturing. A security solution that uses analytical tools to index digital video recordings and issue real-time alerts for a government agency may find its way into a retail or educational environment.

In each case, IBM builds relationships and gets a better understanding of how banks, manufacturers, governments, and other organizations work, and what they may need next. These relationships are key to building the trust necessary to open the door for new partnerships and megadeals. Understanding the industry provides an important way to prepare for what is coming in the future and to be ready with the next solution.

This specific know-how is useful for many IBM endeavors that go forward long after a FOAK project has finished its last task. Just as valuable to IBM are the contacts and trusting relationships that are established through successful implementation of a new and challenging solution.

FOAK's Distinctive Model for Innovation

On any given day, hundreds of individual projects are under way in IBM Research. It would be misleading to imagine that FOAK is the only route to innovation at IBM. IBM's methodical, tested approaches to developing most of its market-ready offerings remain essential because they reduce risk for both IBM and clients. Many clients either can't afford to take chances or choose not to. They buy the IBM brand, in part, because of a reputation for reliability that has been earned through rigorous development processes.

IBM also goes down exploratory paths in innovation. Some projects are aimed more at new knowledge or proofs of concepts than at creating new products and services. A high percentage of these may never lead directly to bottom-line results, but they provide an essential context and culture for ensuring that innovation occurs at the highest levels. These efforts also add to IBM's credibility and help recruit the best minds.

IBM has many programs that foster client collaboration. It's the combination of clients and researchers applying new technologies and

know-how in ways never seen before that makes FOAK client collaborations so different.

The success of a FOAK project takes different forms:

- Knowledge gained from early in-market experiences with new technologies
- Development of a working prototype of a solution not yet available in the marketplace
- Know-how to improve a client's business
- Software components, methodologies, and tools for reuse in IBM products and services

The program aims to demonstrate market-proven success with the first client so that the innovations can be made available on a larger scale through commercialized offerings from IBM's brands and strategic business partners.

FOAK is intended to exploit the middle ground between risk and potential that often is ignored. The funding, time investment, and contractual requirements are all intermediate. It has as a premise that you can get richer innovation collaboration if you make the trust between partners one of the key criteria for working together. As demonstrated by their investments, the people who take part in FOAK are willing to take measured risks. There is a chance that a FOAK project will not yield value; there are no guarantees. Partners need to have expectations that fit the program—neither so low that commitment is unnecessary nor so high that specific results are demanded. In other words, they need to have the experience in innovation and partnering that allows them to be realistic.

LESSON: Make trust an important criterion for choosing partners, sponsors, and other key stakeholders.

Summary

IBM's approach to innovation has evolved with the times. Originally, the IBM Research division operated as a separate entity, patterned after Bell Labs. Competitive and economic pressures led to its collaborating with other

IBM divisions in the form of highly successful Joint Programs that included a new funding mechanism. The emergence of the SAS program upped IBM Research's ante in the growth areas of the '90s, and the FOAK program was a natural extension of this outreach, which connected researchers with S&D and its clients. This became a catalyst to further transform the culture of IBM Research and a powerful way to take advantage of IBM Research's assets to show leadership, build mindshare, create new markets, solve client problems, and deepen relationships.

Engaging with a wider world provided an important step forward, but the journey was just beginning. In 2001, IBM shifted its solution strategy. This made a large portion of the projects that FOAK grew up on irrelevant. The FOAK Board needed to respond to this first by retrenching and then by taking a new look at the kinds of projects that might make sense. As difficult as this challenge was, however, the FOAK Board used that moment of transformation to take on persistent problems around guidance of FOAK, clarity of goals and roles, alignment with sponsoring organizations, client expectations, commercialization, and measurement.

Today, the FOAK program's management system is in a continuous state of transformation. Early each year, the FOAK Board meets to discuss program improvements and alignment with IBM's strategic initiatives and priorities. Additionally, time is allocated during each Board meeting to discuss what is working with the program and what is not so that the processes can be tweaked and tuned throughout the year.

FOAK has many successes it can build on. The examples provide inspiration and guidance for innovators. They also are a ready set of proof points for new partners and IBM sponsors. Through planning, adaptation, and a bit of trial and error, FOAK has put together a pathway that supports succeeding time and again. We'll explore Phase I of the FOAK process in Chapter 2.

Endnotes

1. IBM press release: "IBM Donates Speech Translation Technology to Foster Better Communication and Humanitarian Efforts in Iraq," April 2, 2007.
2. IBM press release: "New Data Sharing Technology Speeds International Collaboration to Identify and Respond to Infectious Diseases," June 2, 2008.

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