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New and necessary in life sciences

Six innovation strategies from industry leaders

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The need to lead with innovation

It can be argued that every organization wants to be innovative. Why then, do so many stick with the tried and trusted? Despite its history of being profitable and successful, the life sciences are not immune to this quandary. Industry disruption has shaken the confidence of most of the 750 executives in our newest study, yet one-third are still thriving during the turbulence of emerging healthcare and life sciences ecosystems. Our analysis of research findings reveals six vital strategies that differentiate life sciences leaders.

Executive summary

The life sciences industry has been among the most successful and profitable industries for decades, with innovation central to this heritage. However, disruptive forces across life sciences, healthcare and technology are changing industry dynamics and creating emerging life sciences and healthcare ecosystems.

And yet, a substantial number of organizations are finding financial success even as they face turbulence. Set against these changing circumstances, few executives are confident about their organizations' abilities to continue innovating successfully in the future; they realize that new innovation strategies are required.

How are organizations addressing the need for innovation, and how are leaders staying competitive? To learn more, the IBM Institute for Business Value (IBV) conducted the 2014 Life Sciences Innovation Survey of 750 industry leaders, including executives from pharmaceutical, biotech and diagnostics organizations, as well as academia.

We asked life sciences executives to assess the profitability of their organizations against competitors, and three distinct groups emerged: 33 percent were *outperformers*, organizations that achieved high profitability. Those with average profitability, the *peer performers*, made up 42 percent of the survey sample. And 25 percent of those surveyed had achieved low profitability, placing them in the *underperformer* group.

Based on our analysis of study findings, we then discovered six innovation strategies that differentiate the most successful life sciences companies from others: viewing innovation as a portfolio, efficiently stopping unsuccessful innovation, embracing open innovation, participating in emerging markets, meeting patient expectations and diversifying growth initiatives.

In our study,

52%

more of life sciences outperformers than underperformers said "meeting patient expectations" was a top goal of innovation.

73%

of surveyed outperformers used a portfolio approach to innovation, versus just 32 percent of underperformers.

Most industry outperformers

63%

told us that open innovation plays an important role in the innovation process.

In this report, we explore these six distinct innovation strategies that differentiate the most successful life sciences companies, allowing them to thrive within current industry and economic volatility (see Figure 1).

Figure 1

Which innovation strategies differentiate successful life sciences companies?

View innovation as a portfolio

Organizations that treated innovation as a portfolio of both internal and external projects sustained greater long-term growth and innovation impetus than when innovation was centered on a single "big idea" or series of disjointed individual projects. As noted in the IBM IBV study, "More than magic," innovation was strongly correlated to outperformance as a whole.[1]

An innovation program enables organizations to manage projects so that new efforts continually replace more mature ones, thus creating sustained momentum. Seventy-three percent of outperformers used a portfolio approach to innovation, compared to just 32 percent of underperformers (see Figure 2).

GE Healthcare and Takeda: Using cross-portfolio innovation to diagnose liver disease

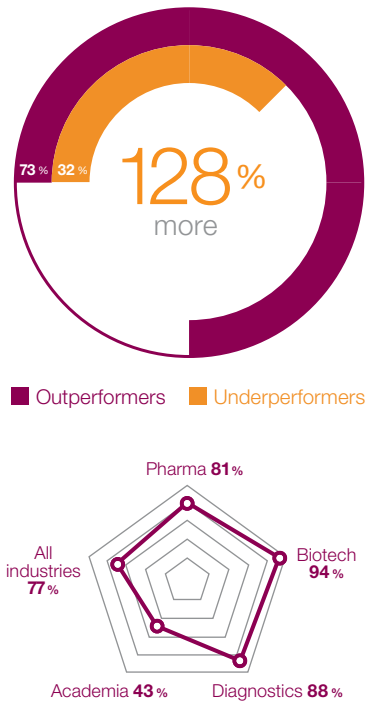
Worldwide trends of aging populations and less healthy lifestyle habits are contributing to the rise of non-alcoholic fatty liver disease (NAFLD). More than 100 million people are estimated to suffer from NAFLD (15-20 percent of the populations of advanced industrial nations).[2]

UK-based GE Healthcare and Takeda, the largest pharmaceutical company in Japan, formed an alliance focused on the imaging of hepatic fibrosis, a key factor in diagnosis and treatment of liver diseases. As part of Takeda's research and development work on liver diseases, GE provides imaging technology to generate liver stiffness maps as an alternative to liver biopsy.

Takeda uses this non-invasive innovation for quick therapeutic drug development to treat NAFLD. By optimizing the strengths of both companies, the collaborative effort aims to help develop a portfolio of therapeutic drugs, as well as new diagnostic technologies for liver diseases.

Figure 2

More outperformers — particularly biotech and pharma — use a portfolio view of their innovation projects.



Source: Survey question, "Thinking of how your organization deals with innovation, does it treat innovation projects as part of an overall portfolio, or a series of 'one-off' projects?"

"We need to create a platform that supports continuous innovation."

Medical device EVP, UK

Recommendations

Maintain a balanced portfolio of all innovation projects in the value chain.
Develop an innovation matrix to measure each project across a set of performance metrics, including the financial potential of projects across various time horizons. Measure and manage innovation performance on three levels: individual, project and overall program. Verify that risks and potential returns are calibrated to optimize returns in accordance with the organization's business and innovation objectives.

Incorporate a virtual innovation model to maintain portfolio impetus.
The virtual innovation model integrates information captured during stages of the innovation value chain and aims to "smooth" capacity, agility and efficiency, and improve ROI across projects. Model proposed strategic and operational changes before starting execution.

Drive external collaborative innovations through an ecosystem model.
Ecosystem partners collaborate to create and deliver innovation projects of mutually beneficial value. Actively open organizational channels, encouraging employees to seek new potential partnering opportunities. Evolve or change policies that might constrict collaboration externally or across the enterprise.

Quickly cull unsuccessful innovation

Even among successful organizations, funding for innovation is not unlimited. For the greatest return from scarce innovation funds, difficult allocation decisions must be made and monitored in a quick and methodical way. A system of decision gates promotes common program-wide governance. Unambiguous, transparent evaluation criteria for innovation investments reinforce objectivity in decision making and help avoid the perpetuation of "pet projects." Killing projects also releases funds for other projects that may be more successful and generate higher returns.

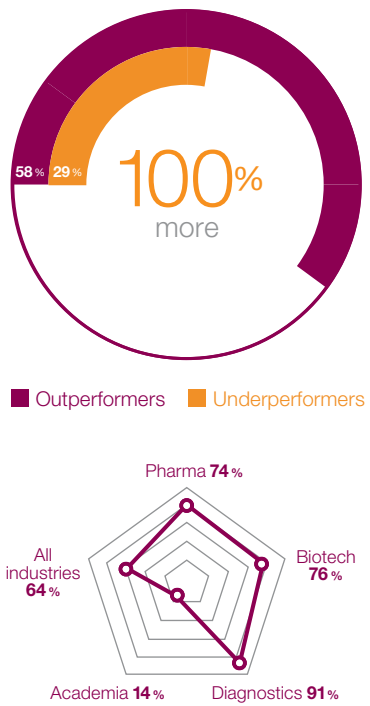
Stopping projects that do not meet objective criteria enables organizations to efficiently release and shift funds to projects with greater probability of success. Closing projects should not be interpreted as failure, but rather used as an opportunity to learn important lessons from the teams involved, wherever they "sit" in the organization. Clearly, the act of identifying and widely communicating such lessons is a vital step in improving future innovations. Fifty-eight percent of outperformers we surveyed were "very prepared" to kill innovation projects that don't fit with their portfolios, versus just 29 percent of underperformers (see Figure 3).

Chorus: Deploying a virtual early-stage development model

Eli Lilly, one of the world's largest pharmaceutical companies, concentrates heavily on building partnerships to innovate for patients. Lilly sought ways to shorten R&D timeframes and increase agility, efficiency and ROI across its projects. So, it piloted Chorus, a new R&D approach that includes outsourcing parts of its value chain and uses virtual drug development to weed out unsuccessful projects at an early stage.

Figure 3

Outperformers were more prepared to rapidly cull projects that did not meet or exceed expectations, or fit with the innovation portfolio.



Source: Survey question, "How prepared is your organization to 'kill' innovation projects when deemed necessary? Please rate on a scale of 1 to 5, where 1 = not prepared at all and 5 = very prepared or not applicable."

"We should learn from both fruitful and failed projects, and build a wisdom base that helps us to move up in the success cycle."

Medical device director, UK

This "quick win/fail fast" approach combines an integrated virtual drug development platform with a more efficient drug development paradigm, aiming to be more efficient and concentrate resources where returns are better. The pilot has brought productivity gains to the clinical proof-of-concept (PoC) process by deploying a new model in development and implementing a lean approach.

Chorus has advanced two dozen molecules into development from discovery through early phase clinical (typically through phase IIa).[3] Of those molecules, ten have been progressed and concluded through clinical proof-of-principle (PoP) or PoC, at a mean cycle time of 25 months and a mean total cost per molecule of USD 3.8 million (direct plus indirect cost).[4]

The median cost of molecule advancement at Chorus is USD 6 million, less than one-third of the industry benchmark of USD 23 million.[5] Cycle time from first toxicity dose to first efficacy dose is now more than 50 percent faster than the industry median of 1045 days[6] Due to the more complex nature of recent additions from Lilly's mainstream portfolio, the mean cycle time for Chorus' contemporary portfolio is now 29 months to clinical proof-of-concept, at a mean total cost per molecule of USD 6.0 million (direct plus indirect cost).[7]

Recommendations

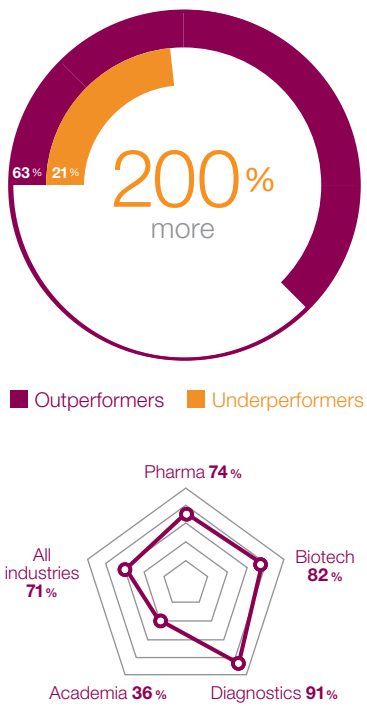
Use advanced analytics to generate valuable, practical insights and decisions on project viability.
Real-world data can help provide a clear picture of a new medicine's future value and help make rapid decisions on whether to halt work on a project. Explore opportunities to use advanced analytics to motivate new areas of innovation, or to incorporate analytics directly into new innovations.

Capture hearts and minds of teams whose project is culled.
Openly celebrate failure to send a signal that not all projects will succeed, but teams should be prepared to try. Collect lessons learned and develop processes, structures and technology to share them across project teams.

Aim for highest value from all project assets.
Although the project may not have delivered the intended drug, compound resources and knowledge will have been developed along the way that can be sold, swapped or shared. Develop processes to identify and leverage valuable components from less successful initiatives, whether they be physical, intellectual or financial.

Figure 4

More outperformers embraced an innovation philosophy of openness – looking outward for creativity and collaboration.



Source, survey question: "Open innovation refers to the integrating of knowledge and expertise from multiple sources to aid in developing new technologies, products and processes. To what extent does open innovation play a role in your innovation process? Rated on a scale of 1 to 5, where 1 = No role and 5 = Very important role."

Embrace open, multiple sources of innovation

Open innovation refers to integrating knowledge and expertise from multiple sources to aid in developing new technologies, products, business models and processes. It can transform many of the challenges and roadblocks of traditional life sciences R&D: realign incentives and behaviors, and promote organizational and cultural change.

Organizations that pursue open innovation tend to obtain higher value from their innovation activities and investments. The most successful ones are integrating both data and expertise from multiple and open sources (see Figure 4).

Sixty-three percent of outperformers told us "open innovation plays an important role in the innovation process." Of particular note were medical technology companies, including the diagnostic sector, where 91 percent of outperformers were using it to drive future growth.

AirStrip: Enabling caregiver collaboration via innovative technology

AirStrip is a technology company based in Texas (U.S.) that provides a mobile and interoperable platform to access critical data and intelligent insights across the healthcare continuum. This platform enables open care and health system innovation and collaboration across traditional boundaries.

AirStrip sends key patient information from hospital systems, devices and electronic health records to a clinician's mobile device, enabling collaboration to develop timely treatment plans, provide insights and improve patient outcomes. The platform is FDA-approved and HIPAA-compliant, and is used in 350 hospitals and health systems in the U.S.[8]

Recommendations

Build ideation platforms.
Develop an open, flexible platform to collect innovative thoughts, both internally and across the ecosystem. Welcome new ideas from traditional and non-traditonal (for example, social media) sources. Finally, implement processes to disseminate ideas across all innovation teams.

Embrace cognitive solutions to source new ideas and select innovation projects.
Use cognitive computing to find insights and connections, and understand the vast amounts of available information. Enable bias-free, evidence-based decisions regarding which projects should be started, continued and ended. Develop processes to incorporate cognitive capabilities as part of all innovation activities.

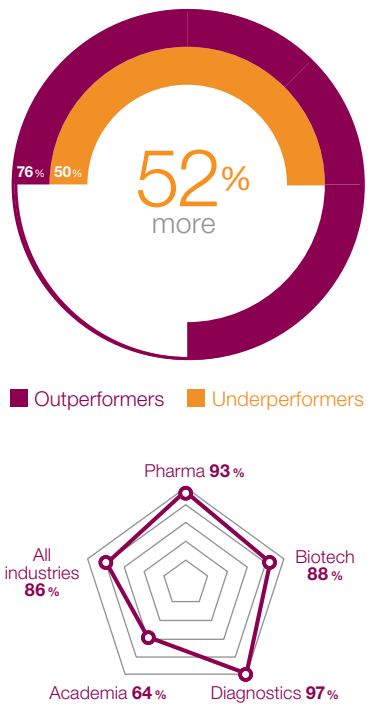
Open up your innovation processes.
Provide employees with the tools and physical/virtual environments to engage in open collaboration internally and externally. Establish governance to help ensure regulatory compliance and protect intellectual property. Expand the reach of your innovation activities to encapsulate direct and indirect inputs from multiple sources.

"Open innovation needs to be treated as an attitude rather than a process."

Pharmaceutical company director, Germany

Figure 5

More outperformers crossed boundaries, and explored new and emerging markets for opportunities and innovation.



Source: Survey question, "Is your organization currently working in emerging markets, or planning to in the upcoming year?"

Emulate leaders in emerging markets

Emerging markets will afford life sciences companies with a significant opportunity to grow and support expanding innovation to efficiently address the health and wellness needs of a rapidly growing middle class and the poor alike. They combine rapid growth with an openness to innovate to address their health and wellness challenges.

As emerging economies grapple with the need to provide expanding populations with quality healthcare, they are expected to be more open to innovation (see Figure 5). Countries like India are already at the vanguard of new healthcare technologies, such as remote medicine. Technology-enabled innovation is only likely to expand. Seventy-six percent of outperformers already work in emerging markets or plan to do so within a year, compared to 50 percent of underperformers.

Roche and Ascletis Bioscience: Teaming to innovate drugs for use in China

Roche and Ascletis entered into a collaboration to develop and commercialize Roche's investigational drug danoprevir in greater China.[9] Treatment is for patients with the Hepatitis-C virus and also of the genotype 1b, which is estimated to be the majority of patients in China with Hepatitis-C.

Ascletis will fund and carry out development, regulatory affairs and manufacturing. This cooperation will potentially serve 10 million patients there and has opened a new market for the drug that Roche acquired from InterMun in 2011.[10] It will be the first direct antiviral agent marketed in China for the liver disease.

Recommendations

Use technology to support innovation projects.
Use technology solutions to access large, rural populations in emerging markets (for example, through remotely monitoring clinical trials). Rethink traditional mechanisms to collect, validate and analyze data from the field, and share findings across both emerging and developed markets.

Play to your strengths.
Exploit any potential innovation advantages that you might have in new markets (for example, knowledge of both western and local traditional medicine). Share your strengths across organizations with complementary capabilities, seeking opportunities for compatibility, synergy and opportunity.

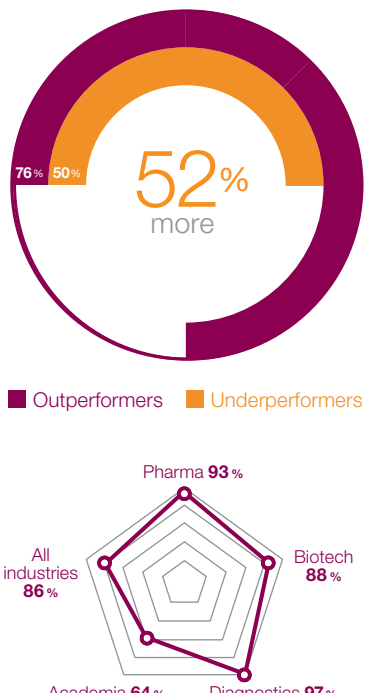
Champion reverse innovation.
Understand and support local innovation policies and programs which aim to move emerging markets from a perspective based on manufacturing existing products to a perspective based on imagining new ones. Practice reverse innovation by then transferring such innovative know-how back into developed markets.

"New markets will be developed through the creation of disruptive innovations that displace earlier technologies."

Pharmaceutical company vice-president, U.S.

Figure 6

More outperformers put consumers at the center of innovation to better meet their expectations.



Source: Survey question, "What are the main goals your organization hopes to achieve through innovation? Select all that apply." Figure reflects percentage that selected "Keep up with patient expectations" and/or "Stay ahead of patient expectations."

Meet patient expectations

Keeping up with expectations has always been important, but never more than now—across industries, the rapid pace of technology change is directly correlated to a rapid rise in expectations, and willingness of consumers to switch to organizations able to meet those expectations (see Figure 6). Fifty-two percent more of life sciences outperformers than underperformers named meeting patient expectations as a top goal of innovation.

EU consortium: Seeking patient input via social channels

It is estimated that nine out of ten adverse reactions from drugs go unreported.[11] In an effort to find those possible adverse drug reactions (ADRs), pharmaceutical companies are reportedly searching social media to increase that identification rate.

A new EU consortium —consisting of regulators, members from pharma and academia — looks to smartphone technology and social media to help with drug safety. A three-year project, Web-RADR, aims to "Recognize Adverse Drug Reactions (ADRs)" through social media. By using the hashtag #pharmacovigilance, the EU-wide Web-RADR mobile app enables patients to report ADRs.

In addition, data mining allows for the capturing of ADRs that a patient wouldn't necessarily report to his/her healthcare professional. The Web-RADR project will recommend how this can be done ethically and scientifically for international drug safety monitoring. This technology has the potential to improve care and drug safety, enabling personalized medicine and supporting pharmaeconomic trials.

Recommendations

Listen to your consumers.
Invite patients, patient advocacy groups, care-givers and providers to participate in the design and execution of clinical trials, product packaging and marketing campaigns. Identify new opportunities to include patients and others in expanded roles, including active collaboration with technical experts or organizational strategists.

Implement social tools.
Social approaches make it easier to capture new ideas from anyone who interacts with the organization. Mine social interactions to identify future innovation needs and trends. Embed innovation events (for example, jams and "hackathons") and social data into the ongoing innovation process.

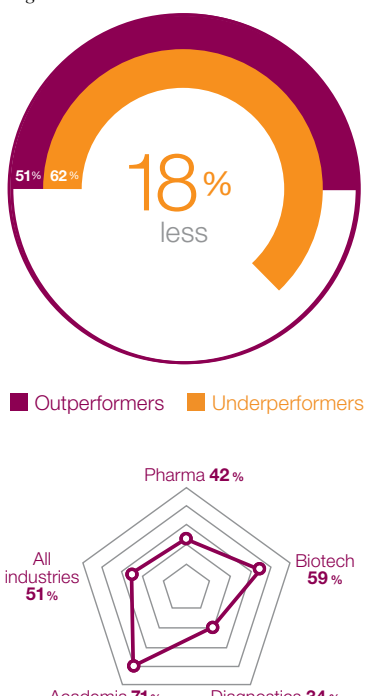
Use digital technology to aid innovation projects.
Collect real-world data from clinical trials and larger patient populations. On an ongoing basis, pool and analyze it for insights so that projects can be continually adapted and personalized. Build capabilities for real-time feedback processes to improve outcomes and compress time-to-market.

"It is the value-added services that create stickiness with a customer or patient."

Biotech manager, Switzerland

Figure 7

Fewer outperformers relied solely on innovation projects to drive short-term revenue growth.



Source: Survey question, "What are the main goals your organization hopes to achieve through innovation? Select all that apply." Figure reflects percentage that selected "Drive revenue growth."

Diversify growth initiatives

The most successful organizations have clear, but broad financial objectives for innovation. While projects need to meet explicit criteria, innovation is expected to play a transformational role for the business, for example, in terms of the organization's value chain or overall industry ecosystem.

Of course, outperforming life sciences companies do not rely entirely on innovation projects to grow their bottom lines (see Figure 7). Increasing revenue was the most-cited goal that organizations hoped to achieve through innovation. Fifty-one percent of industry outperformers said that revenue growth depends on innovation products, while 62 percent of underperformers rely on them for organization growth.

Novartis and QualComm: Joint venture for digital clinical trials

Novartis, based in Switzerland, is the world's number-one pharmaceutical company; Qualcomm is a world leader in 3G, 4G and wireless technologies. Digital health market size is at USD 4 billion and growing at 125 percent, year on year.[12]

In 2014, the top six categories that accounted for 44 percent of all digital health funding were analytics and big data, healthcare consumer engagement, digital medical devices, telemedicine, personalized medicine and population health management.[13]

In 2015 Novartis and Qualcomm set up a joint venture and invested USD 100 million to offer mobile technology in global clinical trials as part of Novartis' "Trials of the Future" program. The venture leverages Qualcomm's 2net devices and transmits to the 2net cloud platform to collect medical data directly from trial participants in their homes.

Recommendations

Balance short-term profitability with longer-term value of disruptive innovation. Decide the mix of innovation that the organization wants to pursue, balancing likely returns from innovation in the short, medium and long terms. Also consider the mix in terms of innovation types: new products, improved operations and different business models. Allocate innovation funds based on parameters defined in your mix.

Understand the short-term cost of "testing the waters" in new markets or ecosystems. Calculate this cost associated with new innovative projects, such as infrastructure set-up or proof-of-concept trials. Develop and maintain a clear vision of necessary investment and likely returns, and manage resources accordingly.

Build innovation into your company's social responsibility (CSR) balance sheet. Increase the company's reputational value through involvement in non-profit/low-profit innovation projects that benefit society as a whole. Focus on CSR initiatives that align to your organization's core capabilities and wider business objectives, to live the potential of "doing well by doing good."

"Every research project needs to collect an ever-increasing amount of data. It's not that all the data is required right away – it's useful for future research."

Generics research leader, UK

Ready or not? Use innovation to stand out among competitors

- What is your plan to design and execute an integrated approach to innovation across the organization?
- How do you handle projects that are slow or failing to meet expectations?
- How can you practice open innovation and establish innovation processes?
- In what ways does your innovation strategy explore external sources of innovation, including new and emerging markets?
- How can you improve your innovation approach to make the critical shift from being product-centric to patient-centric?
- How will you avoid relying exclusively on new products to drive company growth?

How we conducted our research

Our survey was conducted in late 2014 by Oxford Economics with 750 life sciences, academic and other industry leaders. These included 255 pharmaceutical, 154 biotechnology, 152 academic, 106 medical device, 34 medical services, 33 diagnostic manufacturers, 12 medical distributor, 3 generics producer and 1 in consumer healthcare. Executives were from Belgium, China, Germany, Japan, Switzerland, the United Kingdom and the United States.

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About the authors

Heather Fraser is a pharmacist with over 30 years of industry experience in pharmaceutical R&D, consultancy and community pharmacy. She leads the Life Sciences and Healthcare team at the IBM Institute for Business Value, where she has published extensively on the future of the life sciences, healthcare and the emergence of the healthcare ecosystem. Heather has a strong interest in partnering and alliance management between pharmaceutical, biotech and academic organization—topics that she has researched, published and consulted on over the past 15 years. Heather holds an MBA from the University of Warwick. She can be contacted at hfraser@uk.ibm.com.

Anthony Marshall is Strategy Leader and Program Director of the Global CEO Study for the IBM Institute for Business Value. Previously, Anthony led numerous projects in the IBM Strategy and Innovation Financial Services Practice, focusing on business strategy and innovation. Anthony has consulted extensively with U.S. and global clients, working with numerous top-tier organizations in innovation management, digital strategy, transformation and organizational culture. He has also worked in regulation economics, privatization and M&A. Anthony has more than 20 years of consulting, research and analytical experience. He can be reached at anthony2@us.ibm.com.

Teri Melese, PhD, currently holds the position of Assistant Vice Chancellor, Industry Research Alliances in the Office of Research Affairs at University of California, San Diego. She is also an Associate Professor in Medicine and, the Rady School of Management. Teri is a thought leader in academic/industry partnering strategy and has authored several articles in this area in high-profile journals. Previously, she has run an independent research laboratory and was a founding member of a venture-backed startup company, Iconix Biosciences. She has four patents to her name and holds an A.B., a Ph.D. and was an American Cancer Senior Postdoctoral Fellow—all at the University of California.

Contributors

Lauren O'Donnell, Global General Manager and Vice President – Life Sciences, IBM Sales and Distribution

David Root, Consultant – Business Transformation, IBM Global Business Services

William Blair, Consultant – Business Transformation, IBM Global Business Services

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Stephen E. Ballou, April Harris, Sumeet Kad, Vivek Khurana, Eric Lesser, Immanuel Luhn and Joni McDonald.

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The IBM Institute for Business Value, part of IBM Global Business Services, develops fact-based strategic insights for senior business executives around critical public and private sector issues.

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Route 100
Somers, NY 10589

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