

IBM Institute for Business Value



Overview

The time has come to help ensure that business decisions based on the conclusions of profoundly complex science do not place excessive shareholder value at risk. Yearly almost US\$200 billion are spent on technology acquisitions or research and development in science-driven sectors. Of this, a significant proportion fails to deliver value. Too often, what appear to be sound scientific conclusions are actually fundamentally flawed. In many cases, executive decisions are unknowingly misaligned with the business's preferred risk profiles, leading to unacceptable exposures.¹ This trend is clearly illustrated by the growing number of failed initiatives surrounding commercial research, public health and the environment, as well as the ten-fold increase in retractions of scientific papers in the past decade.² Reliance upon conventional scientific review processes has proven to be inadequate to cope with the complexity of 21st-century science. We believe that an independent, systematic and unbiased process for auditing scientific claims can help organizations improve the reliability of science-based decisions, reduce risks, pilot innovation and generate shareholder value – for businesses, consumers and the environment.

Trusting the science that drives your business

A systematic approach to verify scientific claims

How much do you trust your science?

Increasingly, shareholder value is lost due to business decisions that are based on incorrect or misleading scientific claims. Today's peer-review and empirical testing are not sufficient for the demands of the modern board room – especially given the growing complexity of current science and its impact on the fundamental value of businesses.

Numerous real-life examples point to the above. Consider the case of a large investment on a promising product pipeline that failed to meet expectations; a company's first in-human trials that led to severe, unexpected health impacts on participants;³ or a fraudulent diagnostic signature that managed to be published in high-impact scientific journals and used in clinical trials.⁴ Each scenario demonstrates the severe implications in terms of corporate value, consumer exposure and environmental hazards.

Is your organization ready to manage the increasing scientific complexity? What if there existed a way to audit scientific outcomes – allowing business leaders to get an unbiased second opinion before committing to action?



A reliable basis for science-based business decisions

Today, this can be achieved through a set of advanced technologies that provide a deeper, more integrated view of biological systems, and help to broaden insights and build more trust in science. We call this Systems Biology Verification.

Systems Biology Verification (SBV) is an independent, systematic approach for verifying research processes, methods and data, and extrapolating scientific outcomes to identify mid- to long-term effects early. Systems Biology Verification utilizes multidisciplinary research, mathematics and computational power to develop libraries of models, methods and data, which are then used by an independent body – a scientific auditor – to assess and extrapolate the validity of research outcomes. This approach relies on a proven verification methodology and expert consulting services to help assure objectivity and confidentiality through:

- A **verification methodology** that is transparent and repeatable
- **Independence and confidentiality** through third-party services incorporating scientific, computational and strategic consulting
- Consolidation of **empirical data** through a central data platform that combines and extracts insights from unstructured and disparate data sources
- A **library of predictive systems biology methods and tools** – allowing for in-depth analysis, as well as the extrapolation of long-term outcomes.

This approach represents a new collaboration model that connects all entities in the life sciences eco-system to benefit from improved access to reliable scientific information.

Confidence and value across industries and organizations

Initially applied in Life Sciences, Systems Biology Verification is relevant in numerous industries, as well as to policy makers, research institutions and non-profit organizations, in sectors such as Nutrition, Cosmetics, Healthcare, Veterinary and Energy by:

- **Increasing the value of R&D** by identifying potential problems early on and improving success rates at later stages
- **Reducing risks** in strategy development and when performing due diligence for mergers and acquisitions, alliances or licensing
- **Opening new revenue streams** and providing evidence of their value
- **Avoiding litigation costs and reputation damage** by identifying potential harmful effects up front
- **Facilitating evidence-based policy making** by complementing the information submitted by companies and providing an additional verification step in the regulatory process.

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The time has come to change

Every year, billions of dollars are budgeted and committed based on traditional peer review and empirical testing of scientific outcomes. This has resulted in several health and environmental issues – forcing companies to operate outside of their preferred risk profile, and contributing to poor R&D productivity or even legal actions, and ultimately leading to the destruction of shareholder value. By exploring new business models that set independent verification as a key part of scientific research, organizations across the life sciences eco-system can create a reliable scientific basis, realize more value from R&D, reduce associated business risks and facilitate evidence-based policy making.

IBM can assist you to make that change

IBM is actively involved in Systems Biology Verification initiatives, and has demonstrated its success in Fortune 500 companies. These efforts underscore our belief that Systems Biology Verification can transform how organizations validate scientific findings...assure the safety and efficacy of products...bolster scientific credibility...safeguard people and the environment... and drive innovation and growth.

We can assist you in delivering this change and optimize value for your organization. Contact us for an assessment of how our team of experts can start you on your journey.

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