

Understanding the benefits

Systems Biology Verification can be of value to industries, research institutions and policy makers in many sectors, such as Life Sciences, Healthcare, Nutrition, Cosmetics, Veterinary, Tobacco or 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 potential litigation** costs and reputation damage by identifying potentially harmful effects
- **Facilitating evidence-based policy making** by complementing the information submitted by companies and providing an additional verification step in the regulatory process

Conclusion

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, forced companies to operate outside of their preferred risk profile and contributed to poor R&D productivity. To address the increasing scientific complexity, organizations need to challenge the way they perform science today (see Figure). By exploring new business models that set independent verification as a key part of scientific research, organizations across the life sciences ecosystem can create a reliable scientific basis, realize more value from R&D, reduce associated business risks and facilitate evidence-based policy making.

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IBM Institute for Business Value

Better business decisions based on science

Verifying research outcomes leads to new ways to create value



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Verifying research outcomes leads to new ways to create value

Research and Development (R&D) has become more complex and harder to manage – making it difficult for traditional research protocols to keep up. Peer review and empirical sciences have come up short in identifying inaccuracies in scientific claims, leading to severe public health as well as financial consequences. Are organizations ready to manage the increasing scientific complexity?

What if it were possible to audit scientific outcomes, allowing executives to get an unbiased second opinion before committing to action? Such a service – scientific auditing – would allow organizations to:

- Evaluate the validity of scientific claims from collaborators, partners or acquisition targets
- Address the increasingly complex and uncertain environment of discovering new science and proving that it works
- Preempt future regulatory, safety and efficacy requirements
- Increase evidence of value and, thereby, create differentiation, eminence or competitive advantage for products

Scientific auditing would offer numerous benefits, allowing organizations to increase the value of R&D by identifying

potential problems early on and improving success rates at later stages. At the same time, organizations could reduce the risk involved in strategy development and due diligence performance for mergers, acquisitions, alliances or licensing. In addition, scientific auditing could help organizations open new revenue streams by providing evidence of new value-add aspects of existing treatments, as well as avoid potential litigation costs and reputation damage by discovering potentially harmful effects.

An independent, systematic approach

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. SBV 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. SBV relies on a proven verification methodology and expert consulting services to help assure objectivity and confidentiality – along with the necessary tools to conduct the verification. This approach creates a new collaboration model, connecting all actors in the ecosystem and allowing them to benefit from improved access to reliable scientific information.

SBV allows organizations to:

- **Assess methods and data**
 - *Benchmark methods or models* on an unseen dataset using a new form of peer review, distinguished by an in-depth, fully independent and transparent process
 - *Verify empirical data* through the application of a range of different models and methods and the consolidation of multiple sources of data
 - *Generate insights* by identifying relevant information and dependencies in large amounts of disparate data
- **Evaluate safety and efficacy** using proven predictive models and data, as well as long-term, cumulative and environmental impacts. This assessment can be used for:
 - *Innovative study design*
 - *Optimized candidate selection*
 - *Outcome-based solutions*
 - *Product repurposing*
 - *Effective R&D strategy and portfolio management*
- **Provide evidence of value** through an external audit of evidence to support traditional research data in regard to safety and efficacy. This can be used for:
 - *Comparative effectiveness* to drive growth in pricing, market size and market share
 - *Regulatory claim complement* to support traditional research in terms of reliability; evaluate long-term, cumulative or environmental effects; specify target population, specify patient groups and/or optimize dosage
 - *Due diligence* for mergers and acquisitions or licensing deals. SBV can help organizations verify the value of a portfolio prior to acquisition

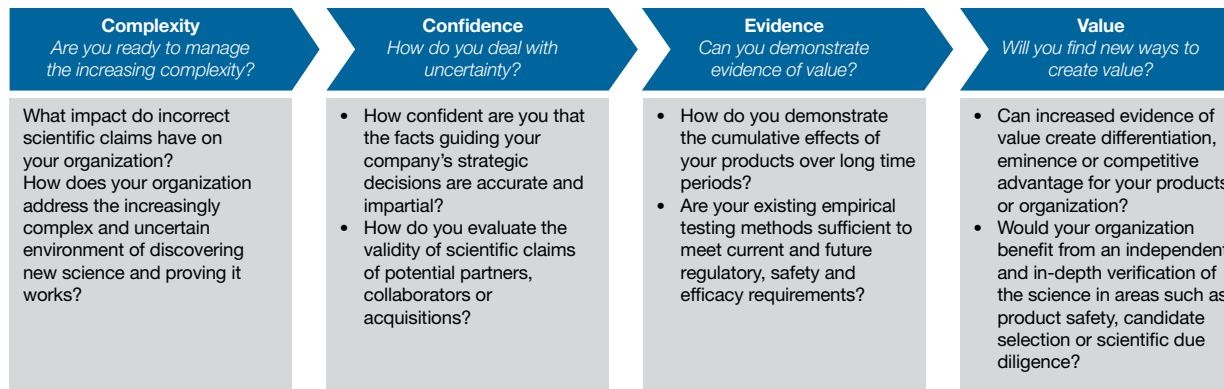


Figure: To create value from the increased scientific complexity, organizations need to question the way they approach science today.
 Source: IBM Global Business Services - Life Sciences