

Rx for pharmaceutical companies: Internal collaboration is the key to improved innovation

Research and Development (R&D) budgets have nearly doubled over the past decade. However, the number of New Chemical Entities (NCEs) introduced to the market each year doesn't reflect that increased spending. Over the past decade, the number of NCEs introduced per year has varied little – until dipping noticeably in 2000.¹ Unless pharmaceutical companies change how work is performed internally, they will find it increasingly difficult to fuel the double-digit earnings growth that has become an industry expectation. A recent study performed by the IBM Institute for Business Value suggests that to optimise R&D investments and create more sustainable value, pharmaceutical companies should focus on improving internal collaboration across traditional boundaries within the organisation.



By Andy E. Wang

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When it comes to internal collaboration, "... a few are actually doing it, some realise that they have to do it, and most don't even think about it." – Former research scientist, Top 15 pharmaceutical company

A dangerous dose of reality

In today's pharmaceutical industry, drug discovery efforts face mounting external and internal pressures. The science of drug discovery has shifted in recent years from chemistry to molecular biology, requiring a heavy investment in new discovery technologies. Although many companies have high hopes of eventually recouping their investment in the form of NCEs, the benefits from new technologies may, realistically, still be years away.

In the meantime, pharmaceutical companies are struggling with the explosion of data that these new drug discovery technologies and tools produce. The sheer volume of information, coupled with disparities in data sources and formats, as well as a lack of standards and integration capability for handling data, are preventing scientists from organising, accessing and reusing information that is key to R&D innovation.

Blockbusters, which have been responsible for driving impressive growth in the pharmaceutical industry in years past, are increasingly difficult to find. Despite the best science that money can buy, including the recently unlocked secrets of the human genome, discovering new medicines has become vastly more difficult. Researchers have unearthed many of the easiest cures and treatments, and drug makers have been largely unable to find replacements for familiar blockbusters that are losing their patent protection.² In fact, the compound annual growth rate for global revenues of currently marketed blockbuster drugs is likely to slip 20 percentage points between 2000 and 2008.³

Research is traditionally a solitary effort, with advances and recognition achieved by individuals or small groups of scientists. This individualistic approach, where scientists and research teams are hesitant to share data, information and knowledge with colleagues in their own organisation, has created knowledge silos that are difficult to bridge across the pharmaceutical company. In addition, many pharmaceutical companies are still struggling to put in place organisational processes and information systems for the capture and categorisation of knowledge.

Without a fundamental change in the traditional way that pharmaceutical companies operate internally, increased innovation – and increased production of NCEs – is an improbable outcome.

Collaborate, innovate, dominate

Internal collaboration creates quantifiable business benefits that directly support the achievement of key business objectives – and can positively impact the bottom line. These include decreased discovery time and cost, reduced development time and cost, and increased product revenue (see Figure 1).

Decreased discovery time and cost

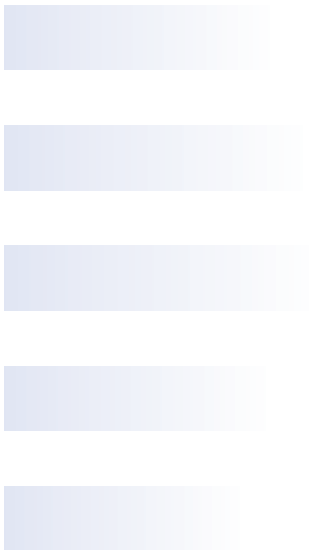
- Fewer lead compounds need to be optimised because of more focused discovery programmes
- More efficient use of fewer resources
- Reduced rework due to better understanding of compounds for new indications
- Faster and more effective knowledge sharing leading to designing key tests (such as biochemical assays and binding assays) more rapidly.

Reduced development time and cost

- Fewer trials conducted in more focused development programmes
- Lower attrition rates in late stage development, which significantly reduces the cost of failure
- More focused patient recruitment with better understanding of disease pathways, resulting in decreased patient costs and fewer patients enrolled per trial
- Reduced rework as a result of better quality of compounds.

Increased product revenue

- New indications identified for existing compounds
- Increased period of exclusivity as a result of reduced duration of development (time to market)
- Deeper market penetration as a result of better targeted patient profiling
- New drug opportunities identified and confirmed using side effects and pharmacogenomics information.



Internal collaboration




R&D objectives	Benefits	Key assumptions	Results from varying levels of productivity improvement		
			5%	15%	25%
 Decreased discovery time and cost	<ul style="list-style-type: none"> Decreased discovery time Decreased cost of discovery 	<ul style="list-style-type: none"> Reduction in duration of discovery time¹ Savings in direct cost of discovery per NCE² 	3.3 months US\$ 9.9M	9.9 months US\$ 29.7M	16.5 months US\$ 49.5M
	 Reduced development time and cost	<ul style="list-style-type: none"> Shortened length of development Decreased direct cost of development Reduced trials conducted and fewer patients enrolled Reduced patient costs 	<ul style="list-style-type: none"> Reduction in duration of development time³ Savings in direct cost of development per programme⁴ Reduction of average number of patients per NDA⁵ Savings in average total cost of patients per NDA⁶ 	3.8 months US\$ 5.7M 647 US\$ 4.5M	11.4 months US\$ 17M 1851 US\$ 12.8M
 Increased product revenue	<ul style="list-style-type: none"> Increase length of exclusivity Increase peak sales Shortened length of development Decreased loss of sales Total revenue benefits per NCE Incremental new NCE per year Incremental new lifetime revenue from new NCEs 	<ul style="list-style-type: none"> Increase in duration of peak year sales⁷ Increase in peak year revenue⁸ Reduction in duration of development time⁹ Reduction in lost sales per programme¹⁰ Increase in revenue per NCE lifetime¹¹ Incremental new NCE per year¹² Incremental lifetime peak year revenue from new NCEs¹³ 	1.8 months US\$ 33M 3.8 months US\$ 148M US\$ 181M 0.2 US\$ 131M	5.4 months US\$ 98M 11.4 months US\$ 445M US\$ 543M 0.5 US\$ 327M	9 months US\$ 164M 19 months US\$ 741M US\$ 905M 0.9 US\$ 589M

Figure 1. Even small gains in productivity from internal collaboration can be substantial.

Source: IBM Institute for Business Value analysis.

¹ Based on the average duration of discovery time of 66 months per NCE.

Source: Parexel's Pharmaceutical R&D Sourcebook 2001. (The R&D Process: Costs and Duration Estimates).

² Based on the direct cost of discovery of US\$ 3M per month. Source: Parexel's Pharmaceutical R&D Sourcebook 2001.

³ Based on the average duration of development time of 76 months per NCE. Source: Lehman Brothers research. "The Fruits of Genomics," January 2001.

⁴ Based on the direct cost of development of US\$ 1.5M per month. Source: Friedman, Billings, Ramsey research, August 2000.

⁵ Based on the average number of 6659 patients per New Drug Application (NDA), the average number of 56 patients per study (Phases I-III), and the average number of 119 studies per NDA.

Source: Parexel's Pharmaceutical R&D Sourcebook 2001. (Emerging Clinical Trial Enrolment Benchmarks: Trial Size Statistics for New Drugs Approved in 2000; The Changing Environment for U.S. Pharmaceuticals). To illustrate, the calculation of the 5% improvement is as follows: $6659 - [(56-2.8) \times (119-6)] = 647$.

⁶ Based on the average cost of US\$ 6924 per patient in clinical trials across Phases I-III.

Source: Parexel's Pharmaceutical R&D Sourcebook 2001. (Cost per Patient in Phases I-III Clinical Trials). To illustrate, the calculation of the 5% improvement is as follows: $647 \text{ patients per NDA} \times \text{US\$ } 6924 \text{ per patient} = \text{US\$ } 4.5\text{M}$.

⁷ Based on the average duration of peak year sales of 36 months per NCE. Source: Parexel's Pharmaceutical R&D Sourcebook 2001.

⁸ Based on peak year sales of US\$ 654M per NCE (during 36 months). Source: Lehman Brothers research. "The Fruits of Genomics," January 2001.

⁹ Based on the average duration of development time of 76 months per NCE. Source: Lehman Brothers research. "The Fruits of Genomics," January 2001.

¹⁰ Based on lost sales of US\$ 1.3M per day and reduction in development time (9). Source: Friedman, Billings, Ramsey research, August 2000.

¹¹ Based on combined impact of increased peak sales (8) and decreased loss of sales (10).

¹² Based on IBM analysis of incremental new NCEs through collaboration as a result of increased attrition earlier in research and decreased attrition later in development.

¹³ Based on the increase in revenue per NCE lifetime (11) and incremental new NCEs per year (12).

“Internal collaboration contributes to innovation and efficiency. It increases innovation at early stages and it contributes to efficiency at late stages.”

– VP of therapeutic area, leading genomics and drug discovery company

“Larger pharma companies will have a more difficult time organising groups of people in a collaborative format. As a result, they either do nothing or only engage in basic, simple things.” – VP of therapeutic area, Top 15 pharmaceutical company

Increased internal collaboration contributes to innovation at the early stage of discovery and bridges silos of knowledge, increasing the chances of serendipity in drug discovery and improving the skills and knowledge of employees. While these ‘softer’ business objectives are difficult to measure against the bottom line, informed and enabled employees, as well as serendipitous events, can result in the type of innovative breakthroughs that drive real value creation.

Targeting the problem: Common barriers to collaboration

There are three types of barriers that impede effective internal collaboration in most pharmaceutical companies: process, organisational and technological.

Process barriers

In most pharmaceutical companies, divisional boundaries have confined scientists’ collaborative work to their own networks, while the linear, segmented structure of the discovery process has made it difficult to deploy resources across therapeutic and functional areas, and to encourage scientists to look beyond their own projects to the goals of the R&D organisation as a whole. Lengthy managerial approval processes for resource allocation have prevented collaboration from happening when it is most beneficial. There are few mechanisms for communicating and capturing good ideas – most never reach management – which discourages scientists from brainstorming and collaborating with their colleagues.

Organisational barriers

Scientists enjoy the autonomy and individuality that their research affords. Many feel that it is a waste of time to focus on issues not directly related to their work. Traditional incentive systems that discourage constructive criticism, as well as policies that make it difficult for scientists working in different therapies to communicate and collaborate with one another, exacerbate the problem. In addition, lack of clear and commonly understood goals across the organisation encourages an individualistic mentality that ignores opportunities for collaboration.

Technology barriers

Technologies used today to facilitate communication in small project teams do not typically have the capability to connect people across the organisation. Databases are often disconnected, and many companies lack a standard platform that supports both discovery and development applications. Most companies lack decision-support technologies with the ability to identify areas where critical knowledge is needed to solve a problem. Concerns about security inhibit collaboration by limiting access to sensitive information to a chosen few.

Four models for collaboration

Once the business benefits and barriers to collaboration are understood, pharmaceutical companies can begin to develop and execute collaborative models that improve research effectiveness and enable increased innovation. A study conducted at the IBM Institute for Business Value identified four models that companies can use to foster greater collaboration: *intra-therapeutic*, *inter-therapeutic*, *research and development*, and *community of practice*. The following scenarios illustrate how each model helps achieve specific R&D business objectives:

Intra-therapeutic model

The intra-therapeutic model brings together scientists (biologists, chemists and pharmacologists) in the same therapeutic area who work across different scientific disciplines.

 Reduced discovery
time and cost

 Reduced development
time and cost

 Increased product
revenue

 Increased chances
of serendipity

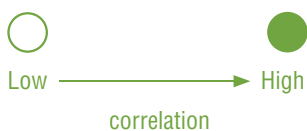
 Improvement
in skills

Dr. Smith, a biologist on the Oncology Team, identified a potential target opportunity. At a regular cross-disciplinary work-group meeting, he met Dr. Wilson, an expert in characterisation of target proteins and the designated chemist liaison for Oncology. After realising that their respective knowledge could be of help to one another, the two scientists decided to explore the opportunity to work jointly on the target.

With Dr. Smith's insight to aid her, Dr. Wilson agreed to conduct several initial experiments to test the hypothesis that the target was responsible for disease progression in breast cancer. As experimentation progressed, both scientists exchanged information electronically and used instant messaging to communicate quickly when time was a factor. After establishing solid evidence to validate the target, Dr. Wilson involved Dr. Smith in educating the chemist team about breast cancer and the mechanism in which the target functioned.

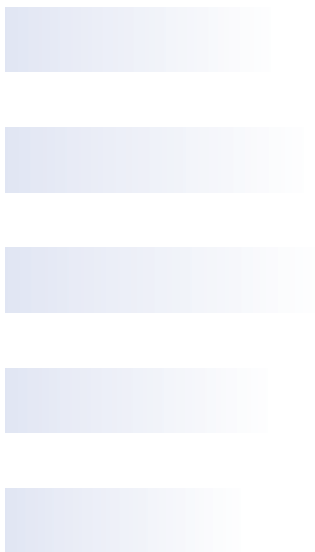
Dr. Wilson's team screened the company's compound library using High Throughput Screening (HTS) and identified several promising compounds. To be sure that they were on the right track, they used the company's newly established 'expert checkpoint and consultation' programme to find Dr. Johnson, a mobile resource that the company relied on for his rare combination of chemistry and biology knowledge. His consultation revealed fatal deficiencies in the design of screening. Consequently, he vetoed all of the compounds identified.

Dr. Johnson's criticism, while constructive, had not previously been well received by teams because the company's old incentive programme was designed to reward only the quantity of compounds developed. However, a new incentive programme focused on rewarding the discovery of higher-potential compounds encouraged the team to heed Dr. Johnson's advice. His input helped the team design a new method to screen and optimise compounds and avoid the costly continuation of flawed research. Eventually, they found a higher-potential compound that showed great promise in preclinical tests.



The diagnosis – In this example, the company instated regular cross-discipline work group meetings and facilitated the close involvement of scientists from different scientific disciplines. New virtual meeting tools and technologies, such as ‘ask the expert’ and instant messaging, made collaboration easier. By increasing the scientists’ ability – and tendency – to collaborate, the company found that they could understand and assess target and disease mechanisms more thoroughly, design and screen potential compounds more effectively, and make better decisions in assessing scientific merit for clinical development of compounds.

There are challenges to this model, such as the time that collaboration takes from formal duties, a long-standing resistance to sharing information in the research environment, counter-productive criticism between rivals, and the difficulty of converting data from different disciplines into a single format. To overcome these challenges, pharmaceutical companies should target changes in their incentive programmes to encourage collaborative activities, adopt measurements that encourage acceptance of constructive criticism and implement a common data format that can be used across the company.



Inter-therapeutic model

The inter-therapeutic model enables scientists—biologists, chemists, pharmacologists/toxicologists – in different therapeutic areas, but often the same scientific discipline, to work together.


Reduced discovery
time and cost


Reduced development
time and cost


Increased product
revenue


Increased chances
of serendipity

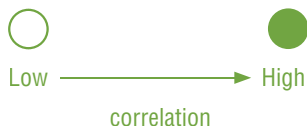

Improvement
in skills

Dr. Johnson, a pharmacologist on the Oncology Team, was conducting assays to optimise a compound. He found that it showed some activity to block a known target in a hematology disease that he had learned about at his company’s annual research conference. He posted a Request-For-Assistance (RFA) on the company’s electronic bulletin board and got a response from Dr. Hopkins, a biologist on the Hematology Team. They discussed the possibility of collaborating with each other.

Dr. Hopkins realised the potential for new indications of the compound in his hematology research area. He turned to the company’s intellectual capital system to find out more about the compound and was able to find some key scientific data to help him understand more about the target. He discussed his findings with Dr. Perry, a chemist on the Hematology team. After working together informally to conduct preliminary research, the doctors presented their promising idea to management and gained approval to establish a formal research team to conduct further tests.

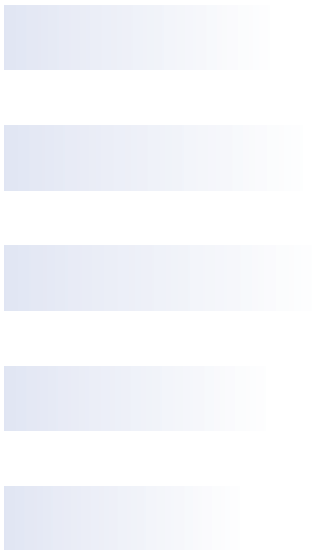
In the meantime, a number of chemists who were experts in this family of compounds learned about its new indications in a companywide research progress newsletter and expressed interest in helping to better understand the interactions of the compound and the target that Drs. Hopkins, Johnson, and Perry were testing.

A common technology platform allowed the collaborating scientists to access all of the relevant data from the Oncology and Hematology teams. During research, scientists not only used the company’s intellectual capital system to learn from previous experiments, they also contributed to the system as they progressed with their research. The collaboration between the scientists significantly expedited the compound’s approval for clinical trial for hematology disease. Drs. Johnson, Hopkins, and Perry received a cross-therapeutic award – and bonuses – for their collaborative effort.



The diagnosis – In this scenario, the company enabled collaboration by putting in place professional, organisational and technological mechanisms that not only facilitated but also provided incentives for knowledge sharing across therapeutic boundaries. The company can now make better decisions regarding cross-indications of new compounds, as well as better decisions regarding new indications for existing compounds. As a result, they will enhance their product portfolio.

Issues, like scientists' preference for attending external conferences versus company events, research managers' concerns that staff scientists aren't focusing on their own research, and employees' initial difficulties in using the intellectual capital system productively may raise some stumbling blocks to implementing this model. However, there are a number of ways that companies can overcome these challenges. Inviting well-known subject experts to annual corporate research conferences can make the events more attractive to scientists. Revised measurement programmes – for both managers and scientists – that are better aligned to the goals of the entire R&D division will provide incentive for scientists to work together. Developing training programmes that teach scientists how to use new technologies will enable them to learn how to work together better, faster.



Research and development model

In the R&D model, scientists, and preclinical and clinical development professionals (Clinical Research Associates [CRAs], data managers and project managers) work together in a collaborative environment.


Reduced discovery
time and cost


Reduced development
time and cost


Increased product
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Increased chances
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Improvement
in skills

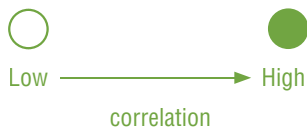
Ms Williams, a CRA on the Oncology clinical team, was a regular attendee of the discovery team’s status meeting – thanks to her company’s new initiative to involve CRAs early in the discovery process. In these meetings, Ms Williams developed a keen understanding of the target and the compound, and the interaction mechanisms between the two. With that understanding, she was able to offer her ideas on the potential delivery and formula information for the compound.

Dr. Smith, a biologist on the Oncology team, was appointed as a liaison from the discovery team to interact with the clinical development team. Dr. Smith had a clear understanding of the way that a clinical protocol was designed. He worked closely with Ms Williams’ clinical team to design a protocol that he believed would better test the compound in the targeted patient profile.

Because Ms Williams’ job scope (and bonus) had been restructured to include collecting and transmitting patient profile and side effect information to the research liaison, she actively collected and transmitted the information to Dr. Smith through the company’s electronic data-capture and management system.

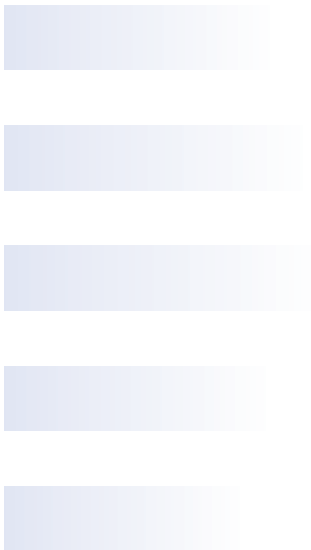
After receiving and analysing the relevant clinical data from Ms Williams, Dr. Smith searched the company’s intellectual capital system to further analyse the data. He found a relationship between patient groups with certain genetic prototypes and the effective functioning of the compound. He presented his findings to several scientists on the discovery team, who, in turn, designed a more-targeted method for screening compounds.






With the side effect information collected from the clinical team, Dr. Smith was able to initiate a discussion with Dr. Hopkins, a biologist on the Hematology team, to further explore the possibility that the compound may show some unexpected, but promising, effects on known hematology targets. The scientists agreed to conduct joint studies to test their hypothesis.



The diagnosis – By expanding the job responsibilities of clinical research associates, holding regular meetings between the research team liaison and clinical development team, and adopting a common technological platform to aid in the transfer of information in R&D, the company restructured the way that scientists and clinical trials professionals work together. Now the company can design clinical programmes that better test compounds, design compounds – such as dosage, formula, delivery mechanism, and the like – more optimally, find new drugs by applying pharmacogenomics, patient profiling, and side effects information, and do a better job of discovering new (or cross-) indications.

Because scientists and clinical trials professionals have different objectives, getting them to work together could be challenging – the clinical team may feel that the scientists are an unwanted intrusion, while CRAs may resent additional work unless there is an effort made to compensate them for their added responsibilities. To address these concerns, companies should link clinical trials professionals' bonuses to the successful completion of new responsibilities and the extent to which they interact with scientists during the trials. Finally, companies can educate CRAs to understand the potential benefits scientists can bring to the clinical trial process, not the least of which is helping CRAs attain their own business objectives.



-  Reduced discovery time and cost
-  Reduced development time and cost
-  Increased product revenue
-  Increased chances of serendipity
-  Improvement in skills

Community of practice model

The community of practice model fosters a collaborative community of scientists and clinical trials professionals by exposure to a common class of problems and a common pursuit of interests.

Dr. Smith, a biologist on the Oncology Team, attended a class that his company offered on collaboration processes and tools. So, when a chance discussion at the company's annual R&D community event – with a staff biologist from another research team – led him to identify a new target opportunity, he knew that collaborating with an expert chemist would help him better validate the target before he presented his findings to his supervisor.

Instead of conducting some experiments right away to confirm his ideas as he used to do, Dr. Smith logged on to the firm's Expert Directories to locate a chemist who could help him with initial chemistry tests to validate the target. He found Dr. Taylor, a biologist on the Infectious Disease Team, who had expertise in working with a known target similar to the new one that Dr. Smith had identified. Dr. Taylor was able to help in reviewing and designing several initial experiments to test Dr. Smith's hypothesis. After some encouraging results, Dr. Taylor agreed to help Dr. Smith further with identifying lead compounds.

Using the firm's mobile resource allocation system, Dr. Smith was able to locate biologists who possessed critical knowledge and skills in the target class area, as well as chemists who had experience developing and testing compounds for this same class of targets.

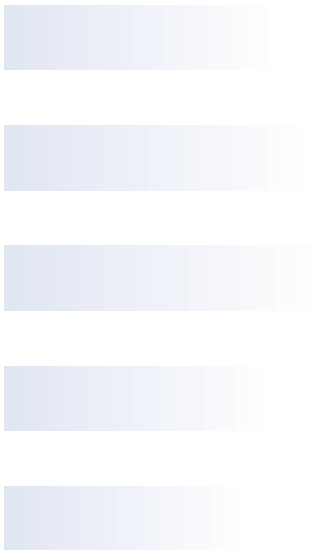
Dr. Smith involved the clinical team early in his discovery team's progress and sought their input on dosage and formula in hopes of designing a better compound. After the lead compound was forwarded to the clinical team, Dr. Smith participated in the design of the clinical protocol. He kept current on any side effects or patient profile data collected by CRAs by visiting the company's intranet portal.

Under a new policy that his firm implemented to encourage collaboration, Dr. Smith was recognised and rewarded for initiating a collaborative team.



The diagnosis – To build a culture where knowledge is actively exchanged and shared, the company made collaboration a regular part of doing business, not just a one-time action. This company has changed the way its employees work by implementing processes and technology that enable collaboration, teaching their employees how to use collaborative tools and social networks, and recognising their employees for helping to create a more collaborative culture. The fact that employees are able to find the knowledge, expertise and information they need – when they need it – increases the overall operational efficiency of the company, as well as employees’ job satisfaction and sense of belonging.

While this holistic collaborative approach improves effectiveness by bringing colleagues from across the company together, it could also create friction as employees try to balance formal work priorities with ‘mandatory’ collaborative activities. Contributing to an intellectual capital system, attending classes on collaborative practices and tracking individual adherence to collaboration guidelines takes time as managers and employees move up the learning curve. Implementing a pilot programme to show the benefits of fostering an effective community and ensuring that success is recognised by scientists and clinical trials professionals across the company is one of the best ways to ease internal aversion to change. Companies can use education to help employees see the intangible benefits of community that not only aid the company in attainment of R&D business objectives, but make employees’ jobs more satisfying and meaningful.



“Some companies have metrics to determine effectiveness of collaboration and other processes. However, most metrics look at quantity and do not look at quality of targets and leads. It’s the biggest problem.” – Former chief science officer, Top 15 pharmaceutical company

Collaborate, innovate, calculate

Whether pharmaceutical firms choose to implement elements of each model to address specific pain points within the organisation, or choose to focus on implementing a single model to improve innovation, it is imperative that the company is sensitive to the organisational difficulties that change can create. Companies should work to identify key obstacles to change and begin to mobilise buy-in and support as soon as possible in the change process in order to make collaboration ‘business as usual’ as quickly as possible.

Proponents of change should be actively recruited and seeded throughout the organisation. Top-rung management should lead by example, lending highly visible support to the activities and initiatives of change agents to reinforce the mandate for collaboration across the organisation. Companies can calm their employees’ fears and resistance to new processes, job responsibilities and workflows by keeping the lines of communication open and devising incentive programmes that reward forward-thinking attitudes and actions.

Once collaboration becomes a corporate priority in day-to-day R&D operations, pharmaceutical firms will want to measure collaboration benefits against corporate business objectives. Outcome (or production-oriented) metrics are a must for assessing quantifiable benefits, such as reduced time in development. However, measuring collaboration benefits and success solely against outcome is short-sighted.

Organisational (or process-oriented) metrics chart intangible benefits from collaboration, such as employees’ adoption of an intellectual capital system or increased social interaction among scientists and clinical trials professionals at corporate research symposia. Although the impact of these benefits on the bottom line is difficult to measure, metrics designed to capture process improvements measure activities that support increases in serendipity and knowledge sharing that ultimately lead to improved innovation.

A two-pronged approach to measuring collaboration benefits assesses both quantifiable and intangible benefits (see Figure 2).

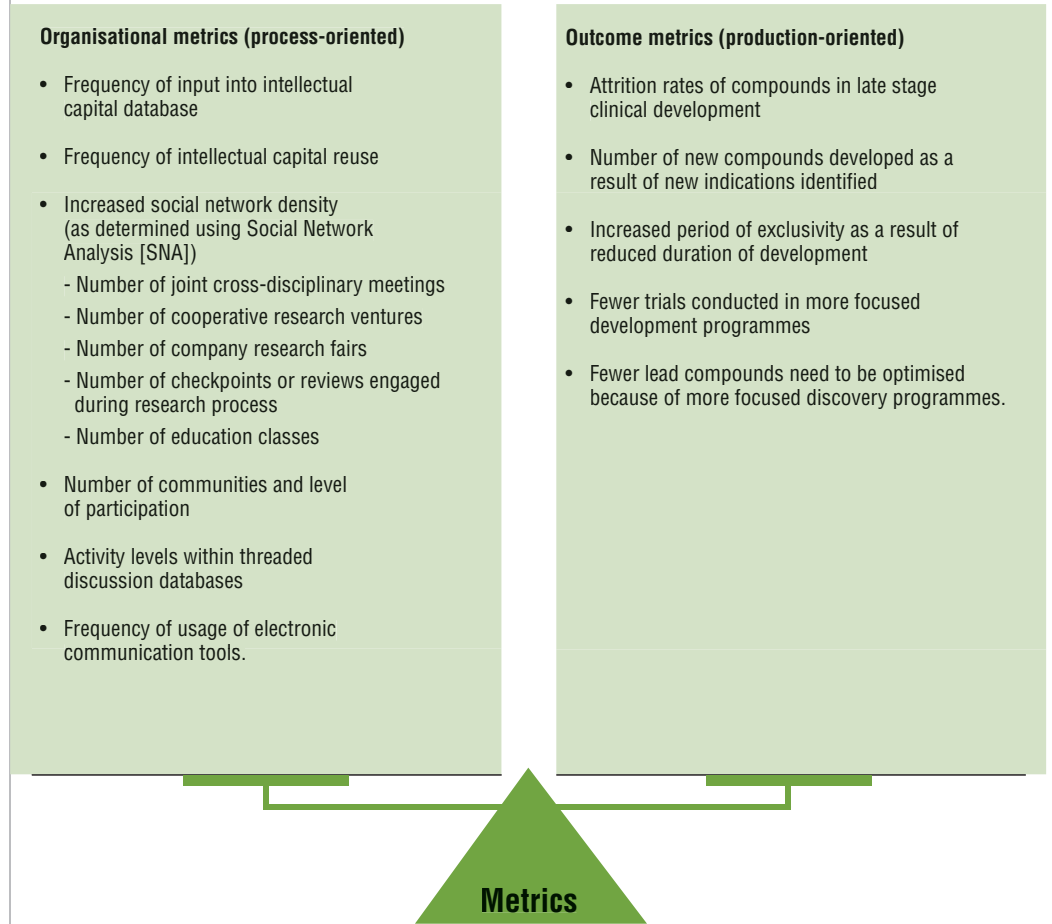
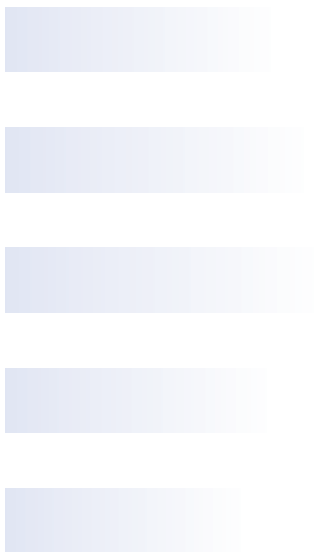


Figure 2. Organisational and outcome metrics.

Source: IBM Institute for Business Value.



Collaboration: How, where and when

To better understand *how* collaboration can help pharmaceutical companies innovate, industry executives should begin by assessing their firm's readiness to adopt a more collaborative approach and deciding *where* and *when* to begin to prepare the organisation for change. The following questions are designed to help executives take the first step toward implementing a collaborative model of their own:

- How flexible is the current discovery process: does it allow scientists to work across organisational boundaries to discover new compounds and improve drug discovery effectiveness?
- Where do individuals go for direction and answers to difficult questions within their own disciplines? Outside their own disciplines?
- How easily can employees search out their colleagues' past and current projects and research? To what extent does this process help employees save time and avoid 'reinventing the wheel'?
- How do management processes and reporting hierarchies support or thwart the bubble-up of new ideas?
- Where do collaborative processes already exist within the company? Have there been difficulties in expanding piloted changes across the enterprise?
- What incentives, if any, does the organisation provide to promote participation in internal collaboration?
- What technologies are provided to enable internal collaboration? Are the technologies widely accepted by employees? What challenges have they encountered in using the technologies?
- Do current security measures serve to protect knowledge, or isolate it?
- Do current metrics for collaboration include quantifiable measurements, such as increased numbers of products in development, as well as metrics that assess the growth of social networks and employee contributions to collaboration?

Conclusion

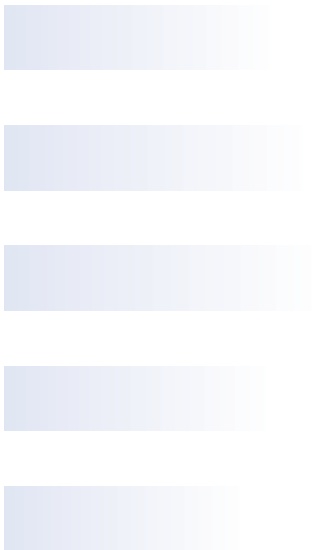
In the era of the exploration of the human genome, it seems contradictory to discuss the possibility of limited growth and slowing revenue in the pharmaceutical industry; however, the fact remains that the industry has reached a juncture where scientific progress no longer equals automatic shareholder satisfaction.

This new century demands the rapid discovery and development of drugs that are more difficult to develop, target smaller patient groups, cost less, and require more testing and better marketing. That said, the production of NCEs is the only source of value that is sustainable long-term for pharmaceutical companies. Whereas business as usual threatens that potential, collaboration fuels discovery and the increased internal innovation that pharmaceutical firms need now to survive in an increasingly challenging market.

By assessing how collaboration can create benefits that map to organisational weaknesses and implementing a collaboration model that strengthens the company from the inside-out – thereby changing the way their company works – pharmaceutical firms can begin to bank on their ability to innovate.

Increased collaboration doesn't happen overnight. Whatever internal initiatives pharmaceutical companies undertake to improve the way they approach drug discovery, there will be challenges. But it doesn't have to be an uphill battle: with focused ingenuity and expertise, the road to collaboration can be shortened. To discuss how we might help your company begin to collaborate – and innovate – sooner, contact us at bva@us.ibm.com. To browse through additional resources for business executives, we invite you to visit our Web site at:

ibm.com/services/strategy



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The IBM Institute for Business Value develops fact-based strategic insights for senior business executives around critical industry-specific and cross-industry issues. Clients in the Institute's member programmes – the IBM Business Value Alliance and the IBM Institute for Knowledge-Based Organisations – benefit from access to in-depth consulting studies, a community of peers, and dialogue with IBM strategic advisors. These programmes help executives realise business value in an environment of rapid, technology-enabled change. You can contact the authors or send an e-mail to iibv@us.ibm.com for more information on these programmes.

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References

- ¹ CMR International/PJB Publications Ltd, 2000: Pharmaceutical R&D Compendium Database.
- ² Hensley, Scott. “Drug Prices – Why They Keep Soaring.” *The Wall Street Journal*, 2nd May, 2002.
- ³ Rodgers, Susannah. “Bleak Outlook For Blockbuster Revenues–Stokes M&A Debate.” *Dow Jones International News*, 24th April, 2002.



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