

Integrated and Open Innovation: The Best of Both Worlds



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After years of success from fully integrated, huge and relatively closed R&D centres in the 1970's and 80's large pharmaceutical companies have slowly but increasingly embraced the concept of leveraging innovation from external sources to build and balance their internal R&D pipelines. This has coincided with plenty of statements of how "Open Innovation" adds value for pharma and a massive increase in partnering and networking activities and departments within companies. And yet. Open innovation is easier to put into a box and assign to a new group of executives than integrate culturally into proud and established internal R&D organisations. Management systems that are geared to progressing internal assets struggle to cope with the challenge of dealing with outside parties. In this paper we explore this integration challenge and how companies can have the best of both worlds by applying an Integrated and Open Innovation approach to their R&D and Commercial activities.

In Pharma, Open Innovation needs Closed Innovation and vice versa

The Pharmaceutical industry's interpretation of "Open Innovation" now embraces two mindsets: an original "combine internal/external capabilities" philosophy and a more recent "open-source/free" approach. For the original

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idea of combining the best of two parties' capabilities, pharma Open Innovation can legitimately be argued to be old wine in new bottles: the industry has always relied on partnerships with pharma, biotech, academic institutions and others to innovate. However the open-source/free concept is newer to pharma than it is to the software industry from which it came. Unlike with software, the basis for advantage and value creation for a pharma company is more driven by intellectual property (IP) rather than speed to reach huge critical mass. And since IP is by its nature closed not open, pharma companies are constantly wrestling with being both open and closed. We believe that pharma needs to master this open/closed dichotomy by integrating the two. It is the combination of the best that is outside with the best that is inside the company that enables the best innovation.

Since the lifeblood and biggest opportunity for value creation for the pharma industry is Intellectual Property (IP), pharma companies must find ways to gain or create IP from external partners, for example biotechs, technology providers, and academic institutions. Often the simplest path to achieve this from an IP point of view is for the pharma to acquire a biotech or academic spin-out company outright. While this is a relatively quick and clean way of accessing external assets and/or capabilities, it is not Open Innovation in its purest sense, as it basically just scales up a closed innovation system.

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We define the essence of Open Innovation to be art of partnering with others rather than acquiring them. Furthermore the approach to Open Innovation can and should be highly open in terms of searching for the right partners that have external expertise and IP that could be of high value, then potentially more closed as two parties create and sign legal contracts with each other to divide up the responsibilities and value captured from the envisaged innovation. This requires an "Integrated and Open Innovation" approach, which successfully integrates innovation from outside with innovation from the inside.

Open Innovation is attracting attention and investment

Pharma companies have committed significant resources to experimenting and establishing a plethora of approaches to Open Innovation that reach beyond traditional one-to-one partnering/licensing into the world of pre-competitive consortia, sharing assets and capabilities, and investing in venture funds.

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Pre-competitive Consortia

Participating in pre-competitive consortia is the form of Open Innovation that is most analogous to the open-source software concept favoured by some in the Tech industry. Institutions such as the Structural Genomics Consortium (SGC) bring companies and institutions together in an open fashion to solve tough scientific problems, while not pre-granting any IP rights to the outcomes. Similarly the European Innovative Medicines Initiative is Europe's largest public-private initiative for speeding up the development of medicines and includes companies and institutions of all sizes. Pharma companies are also present in the Biomarkers Consortium and Pistoia Alliance and are founding members of the Italian Drug Discovery Network. As well as the shared generation of data, these consortia have been identified as a good way to grow a company's network of academics, KOLs, and start-ups.

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However since these activities are truly open, the path to IP, assets and value is less direct than other Open Innovation methods. So though it is of great benefit to scientific progress, it is harder for pharma companies to directly monetise. The consequence is that participation in terms of resources and money is generally skewed towards the largest pharma companies that have the scale that allows them to provide in-kind resources and funding for such efforts. By contrast mid-sized and smaller players have less resources and a harder time justifying the return on investment given the typically very long-term outcomes from the work as well as difficulties in securing IP.

Shared Assets and Capabilities

Many Big Pharmas are promoting direct interaction of internal scientists and biotech start-ups by locating them together in open campuses. Examples include Pfizer's €145m investment in its Grange Castle site in Dublin and GSK's Stevenage Bioscience Catalyst hub in the UK. Smaller and mid-sized companies are following in their footsteps.

As is the case with pre-competitive consortia, the directly monetisable outcomes from openly sharing assets and capabilities are not as clear as they are with traditional partnering arrangements. However they do have "softer" benefits in exposing scientists to outside models and thereby developing internal capabilities, as well as improving visibility for the company in the pharma ecosystem. So mid-sized companies are following their Big Pharma peers by now initiating Open Innovation efforts in this way. In December, Pierre Fabre launched its Open Nature Library that will

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share Pierre Fabre’s private plant collection, as well as its “expertise of the phyto-industrial value chain”. Additionally, LEO Pharma established an Open Innovation platform that provides non-binding, no-questions-asked access to a suite of their cell-based in-vitro assays.

Investing in Venture Funds

Venture funds have a window on innovation that some pharma companies can only dream of. Biotechs and academic spin-out companies are particularly interested in getting attention from such funds, and pharma has to compete with the funds for access to such innovation. So although corporate venturing has been going on somewhat under the radar for decades, but more latterly the concept of pharma working with venture partners has ramped up significantly. 19 of the top 25 pharmaceutical firms are investing directly, or as limited partners in, venture funds. These funds predominantly make strategic investments to secure access to external innovation. Like Big Pharma, a number of Europe’s mid-sized pharmaceutical companies have more latterly chosen to establish venture funds as one way of understanding what is available. Examples of such funds include Norgine, Morphosys, Lundbeck, Merz and Pierre Fabre; interestingly, all have gone it alone so far rather than investing as a Limited Partner in other funds, as some Big Pharmas have chosen to do in addition to their own corporate venturing activities.

Three important challenges for effective Integrated and Open Innovation

The reality of pharma R&D today is therefore one of a spectrum of activities with partner companies or institutions involved in almost all innovative activity, and diverse partners providing value in different ways across the spectrum:

| | | Innovation Type | | | |
|--------------------|-------------|--|--|--|---|
| | | Closed ← | | | → Open |
| Value from Partner | Description | Fully in-house R&D <ul style="list-style-type: none"> All R&D capabilities maintained in-house | Out-sourcing <ul style="list-style-type: none"> Service provider takes on operational risk -or- Operational risk of providing the service is shared | External Innovation <ul style="list-style-type: none"> Selected R&D activities carried out by a partner with internalisation at predetermined milestones | Pre-competitive Innovation <ul style="list-style-type: none"> Partners working together on the same project or challenge Co-creation of IP |
| | | <ul style="list-style-type: none"> None | <ul style="list-style-type: none"> Efficient Service | <ul style="list-style-type: none"> Asset or Technology | <ul style="list-style-type: none"> Capability Enhancement |

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The Integrated and Open Innovation Spectrum for Pharma Companies

The key to success is integrating these diverse methods of innovation in a way that gets the most out of each. This presents three important challenges: finding quality, embracing the outside, and managing the integration of outside and inside. All require skills and expertise internally to the organisation that have not necessarily been developed through the organisation's history, where a culture of "success-from-inside" can take a long time to adjust.

The first challenge of finding the external quality that is needed is significant. It is often hidden in an abundance of companies and institutions and service companies that are more than happy to promote their perceived advantages but less willing to discuss their "Achilles Heels". The sheer abundance can create complexity and overload in search and evaluate activities, both in terms of the capacity to search and the skilled internal R&D/Commercial capabilities to triage and evaluate.

Secondly, to secure value from partners that have been found in an "open" way, internal pharma executives must genuinely embrace the value of external innovation and the associated notion that innovation performed outside of their own organisations can be of higher value than innovation performed inside. If this is not a widely shared and reinforced cultural belief, internal organisations can directly or indirectly stifle partners' innovation.

Finally to be fully integrated, pharma executives must manage the realities of multiple partners that are not fully controlled and have very different cultures, management systems and points of view. This requires leadership and influence skills as well as bespoke processes to make sure that the best is brought out of every partner that the company engages with.

Embedding Integrated and Open Innovation successfully

Addressing the three challenges of embedding truly Integrated and Open Innovation that are described above is easier said than done. The leadership, project management and partner-oriented competencies required are very different to the competencies that are traditionally developed through moving up the ranks in large R&D centres. To add to this, the sheer volume of external opportunities creates organisational complexity.

One solution to the challenges is to create entirely separate and dedicated open innovation business units or entities such as Johnson & Johnson's JLABs and Pfizer's Centers for Therapeutic Innovation. With Big Pharma scale this can be done, and the philosophy of creating focused and dedicated teams with all the skills needed to address the challenges is sound. However the question is how this leverages the internal capabilities that can understand and create more value from the external

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partners' capabilities or assets or technologies. If these are separated organisationally, the company risks working at two speeds, internally and externally. Without internal and experienced eyes on external opportunities the risk is first that external efforts are not triaged well or given the best chance to succeed and second that internal capabilities are not constantly enhanced by wiring to the external world.

Companies must therefore foster a strong external/open innovation culture throughout R&D by carefully managing the interfaces between external innovation groups/entities and internal groups/entities, as well as the R&D-Business Development interfaces when both parties are involved in searching for partners. The interfaces challenges are particularly acute in mid-sized and smaller companies that do not have the scale to create large internal units dedicated solely to open/external innovation. But the opportunity for integrated internal/external innovation is greatest when these challenges are addressed head on rather than separated organisationally.

We expect pharma companies to continue to apply their significant R&D resources and financial muscles to search for and bring in external innovation, going out of their way to be seen as both open to outside sources of innovation and partners of choice for other companies. Not all of the investments will pay off and the integration with internal resources will be difficult, but the competition for quality innovation is so intense that the Open and Integrated Innovation that is required to succeed is here to stay.