

Smarter Information and Resource Management for True Collaboration in Pharma

Pharmaceutical industry is progressively moving beyond cooperation to embrace true collaboration. And for good reason. Collaboration has a positive impact on the drug pipeline and gives a boost over the in-house developed assets. A Deloitte study that analyzed the R&D pipelines of 12 leading biopharma companies indicates that the majority of their pipeline value comes from externally sourced assets (prospect drugs) in comparison with the internal pipeline ⁽¹⁾. Rather than committing the limited internal resources to a restricted number of projects, collaboration allows companies to work on multiple endeavors.

Pharmaceutical companies are starting to realize these benefits, and the appetite for various levels of collaboration is increasing.

1. Collaboration between pharmaceutical companies

Collaboration and working with competitors in the pharma sector was unimaginable a decade ago. That is changing now. For instance, Novartis and GSK worked together to simplify change management with respect to therapeutic areas. They worked on an asset-swap deal, in which GSK acquired Novartis' vaccine business while Novartis took the British company's oncology portfolio.

Companies are teaming up and combining the most promising candidates in their pipelines as well. One such example is the outcome of the partnership between Sanofi and Regeneron, which brought a new heart drug Praluent to the market ⁽²⁾.

2. Collaboration between pharma companies and startups

The emergence of technologies like AI, ML, and Blockchain has completely changed the game. The use of deep learning approaches can accelerate the process of identifying new therapeutic candidates. It is opportunities like these where

startups come in the picture. Leading pharmaceutical companies are working with startups on innovative solutions. There are over 100 artificial Intelligence (AI) based drug discovery startups across the globe that address business challenges in multiple areas in drug research. One such company, Insilico Medicine, a Hong Kong based startup, helped identify 6 promising treatments for fibrosis in just 21 days ⁽³⁾.

3. Collaboration with academia and research

Driving technological advancements is the primary objective behind such collaborations. We are witnessing a realignment in focus to initiate regional/global 'science hubs' with academia to reignite biomedical innovation. Some of the examples of such initiatives include Pfizer's Centers for Therapeutic Innovation, GSK's Tres Cantos Open Lab Foundation, Lilly's Phenotypic Drug Discovery Initiative, Merck's SAGE Bionetworks and Clinical and Translational Science Awards Program ⁽⁴⁻⁵⁾.

What are the implications of this shift?

A 'one source' knowledge platform is imperative for various collaborators to work together. However, hosting such a platform for all research data within and across collaborators requires multiple capabilities such as access to reliable data sources, inter-operability within data sets, and access privilege and audit trail management. Besides technical challenges, issues of governance to enable appropriate and effective information exchange further complicate this process. Shift in mindset from work 'in silos' to an open environment isn't easy either.

Unfortunately, most pharmaceutical companies are saddled with legacy systems not designed with collaboration in mind. As such, users are forced to view multiple data dumps to collate information of interest. Relying on legacy systems for collaboration is not feasible in the long run.

Companies need platforms that can enable scientific content and information hosting, research data and resource sharing, and efficient project management. As reproducibility of results is one of the prime research requirements, these platforms or gateways should be cloud-enabled to address compute resource, software and workflow sharing ⁽⁶⁾.

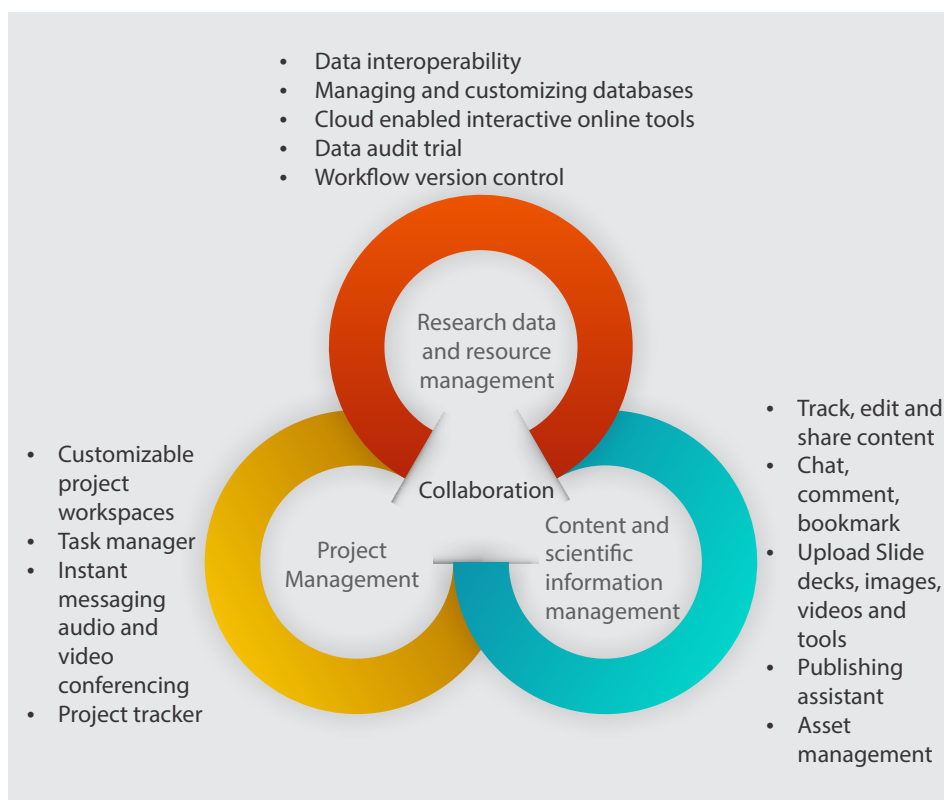


Figure 1: Various features of a collaboration platform

1. Research data and resources management

Sharing and managing experimental data and results is riddled with multiple technical challenges. Not only is the data complex, but it also spans multiple research areas like omics, clinical, and patient data. Furthermore, consolidating this data is time consuming due to the lack of interoperability and data standards. Besides data management, platforms for collaboration have to address the need for sharing resources such as software tools, workflows and compute resource to enable reproducing of results. Inferences can then be drawn from using a holistic approach. Issues of faster retrieval of files, audit trail, version control and restricted access to sensitive data also need to be addressed.

A versioning system helps keep track of all submitted copies, merge information from simultaneously modified documents, and restore the working copy of a document to a previous version in cases where multiple people are editing the same document. Cloud-based access to tools, online presentations, and interactive online tools help various groups work on the same tool simultaneously and share resources.

2. Content and scientific information management

A collaboration platform can empower scientists by providing easy access to up-to-date and comprehensive scientific information in the respective field of interest. It can also help them run custom searches designed to answer very specific queries and assist in coming up with new ideas and thoughts. This ability to curate relevant content and track citations can foster research in many ways.

Furthermore, advanced predictive analytics capabilities can be integrated with such platforms as well. This can be used to recommend options at each stage on advancing leads ahead in the pipeline. It is challenging to make decisions regarding what assets to pursue and which ones to kill in the pipeline. Using 'one source' of integrated data that links disparate data across multiple sources establishing linkages among functions in drug research within and across collaborators can provide valuable insights to improve the accuracy of such decisions. This can in turn lead to insights across portfolios and enhance collaboration among all stakeholders in drug research.

3. Project management

Multiple organizations and teams across geographies are often involved in working towards a common goal. Various team members and leads need to plan, coordinate, control and monitor projects across various research areas. Effective project management tools should ensure seamless collaboration with external partners through customized project, workspaces and workflows for each of the collaborators to allow project-specific discussions. A common screen to check tasks across multiple projects ensures that projects are on track and one has sufficient resources to execute them. For faster communication, real-time instant messaging and audio and video conferencing can be leveraged. Scheduling assistants can help manage calendars for various stakeholders and schedule meetings based on different time zones across geographies.

Futuristic collaborative platforms

In order to maintain the pace and flow of innovation in drug research, it is evident that pharmaceutical companies can no longer afford to work in isolation. They need to have a good understanding of internal capabilities and should actively identify the source of expertise outside their organization, which will complement internal knowledge and capabilities for collaboration.

Collaborative work requires one to communicate efficiently across teams. Hosting collaborative knowledge platforms that allow open, transparent communication across all stakeholders can be the first step in this direction. This will enhance communications, tracking holistic progress and achieving common goals faster.

The marketplace is brimming with such tools and platforms - both in open source and commercial off-the-shelf (COTS) categories. These tools can cater to the needs related to project management, data management, and knowledge sharing and management. A holistic approach to collaboration would address all of the above-mentioned aspects namely scientific content and information management, research data and resource management and, project management. Depending upon the need of each organization, steps can be taken in the right direction to design and build futuristic knowledge platforms. Most organizations prefer to start with incremental steps and establish the longer-term future state by analyzing the outcome of small-scale pilots.

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Arundhati Saraph works in the area of discovery research and has over 23 years of experience in Biomedical and Life Sciences research. Arundhati has a PhD in Biochemistry from National Chemical Laboratory (NCL), Pune. She worked as a Postdoctoral Fellow at Rensselaer Polytechnic Institute, (RPI) Troy, NY, USA. Her work involved design and validation of peptide-based therapeutics. She has experience in leading research projects, collaborations, and partnerships with industry and research organizations. These have resulted in several publications and development of solutions that can be leveraged for bio-medical research in and the pharma sector.

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