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Perspective

SEMANTIC INTEROPERABILITY FOR DRUG DISCLOSURE

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INTRODUCTION

Academic institutions, publishers, small and medium-sized businesses, and pharmaceutical companies all participate in the public–private partnership known as Open PHACTS. The project's objective is to create and maintain an "open pharmacological space" by implementing and improving cutting-edge semantic web technologies and standards. It focuses on robust and useful applications for answering specific drug discovery research questions. OPS aim to support open innovation and in-house private drug discovery research, as well as to facilitate improvements in drug discovery in academia and industry. The Open PHACTS project's strategy for overcoming these obstacles, both technically and socially, is described in this paper. In the life sciences, research and discovery are incredibly complex. The modern scientific process is complex on numerous levels because of our attempts to comprehend the complexity of life and the processes associated with disease and its treatment. We are now able to generate enormous amounts of data thanks to current technologies. The typical scientific procedure generates a great deal of information that is scattered across a variety of data sources and hidden from view. Drug discovery and data-driven life science research will increasingly rely on a community of collaborators to extract knowledge from these sources and resolve difficult questions.

DISCUSSION

The need for innovation in data storage, curation, integration, analysis, and "data publication" is parallel to the development and application of novel data generation methods and tools. These aspects of "data stewardship" are being developed in both the public and private sectors, and although they are still relatively unguided, they present a chance to make significant contributions to drug discovery research. The end result is a wide range of data sources with different data quality, formats, standards, copyright, and licensing arrangements. This hinders knowledge discovery by making data sharing, integration, re-use, and further exploitation more difficult. As a result, numerous businesses have already invested a significant amount of effort in mining clinical data, literature, patents, and open- and free-access databases. This is a significant effort duplication. Costs will be reduced by working together on precompetitive data integration. Open PHACTS gives project participants and associated collaborators a way to work together with cutting-edge semantic technology to show how valuable resource description framework (RDF) and semantic web technologies are when applied directly to cutting-edge problems. The majority of the recent

advancements in science are the result of collective and international collaboration. The data and information generated must be preserved in a stable, unambiguous, trustworthy, and computer readable state in order to enable such efforts; This is made easier by the open standards provided by semantic web technologies, which can significantly improve data and information interoperability [1,2].

The scientific method can be thought of as a workflow from a methodological point of view. Generally the examination of just individual perceptions was the chief beginning stage of speculation arrangement. Currently, thousands or even millions of observations are accessible thanks to computerization. While we continue to treat data as distinct objects, we also consider patterns that link large amounts of data into unified rules. To connect the individual observations to the outcomes of automation and high-throughput screening methods, this necessitates novel data analysis techniques. The so-called data deluge is the accumulation of so much data that humans are unable to synthesize the explicit, much less the implicit data as a result of technological advancements. Data from DNA and RNA sequencing, proteomics, metabolomics, screening, biomedical imaging, and analysis of data in existing databases, narrative literature, and medical records now comprise the majority of scientific investigations in life science. The traditional biological cycle of observational research driving hypothesis formation and experimental design does not fundamentally change in spite of this explosion in available data and information. The aggregated data's complexity, which reveals ever-increasing layers of biology's complexity, poses the primary obstacle in contemporary biology.

The primary method for working with these complex data is now the creation of standardized, reusable, stable, up-to-date, and simple-to-use workflow elements. To support these workflows, a substantial open, interoperable data space is required. Open PHACTS clearly has the potential to change the way people think about pharmacology and other fields. Within the first year of the project, members of the translational research communities, the medical informatics communities, the omics communities, and even research fields that are not related to the life sciences have shown interest. Open PHACTS has recently established a "waiting room" and a "gatekeeper" function to manage interested parties' participation. Open PHACTS and IMI as a result, have taken on a daunting responsibility by generating such interest and expectations throughout the life science community. It would not be acceptable if the OPS appeared technically feasible but failed to meet expectations in terms of accelerating drug discovery and scientific advancement far beyond the restricted "small-molecule space." It would also be unacceptable if the research carried out here gave the impression that it was just another project that quietly vanished when funding ran out. Therefore, it is crucial that IMI develop a comprehensive and widely adopted data, information, and knowledge management strategy, preferably in close collaboration with the European Strategy Forum on Research Infrastructures (ESFRI) and comparable initiatives in the United States (such as Sage Bionetworks, NCBO, and others).

It is anticipated that the OPS system and the exemplars that will be delivered during the originally funded project will provide research insights. The integration and mapping of disparate data types and sources, the influence of data quality, crowdsourcing, and duration on decision making, as well

as the procedures and strategies required to manage a diverse team in order to deliver a groundbreaking technology platform, will be among these [3-6].

CONCLUSION

As the OPS platform is made available to the community as an open source software system with its associated open data, the question of whether it might eventually replace existing internal systems will become clear. Businesses have the option of adopting just some of the solution's components or just the data slices that best suit their requirements. Utilizing the readily available programming interfaces, it is possible that the ideal solution for some organizations will be the integration of existing internal systems with the OPS platform. However, one of the primary reasons that many businesses participate in this project is to free up internal resources for higher-priority tasks by replacing in-house systems with something that they do not have to solely maintain. In the end, whether or not new knowledge and wisdom can be extracted will determine the project's success. Naturally, adding new drugs to the pipeline as a result of the work would be beneficial.

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