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OptumLabs and Health Care Researchers

Partner to Identify AI's Greatest Impact

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Paul Bleicher is CEO of OptumLabs, a collaborative research and innovation center within Optum, which is a health services and innovation company that is, itself, a part of UnitedHealth Group. Prior to joining OptumLabs in 2013, Paul was Chief Medical Officer for Humedica, a next-generation clinical informatics company, and co-founder of Phase Forward, which helped transform pharmaceutical clinical trials from paper to the web. Paul received an MD and PhD from University of Rochester School of Medicine and Dentistry and trained in internal medicine and dermatology at Harvard Medical School hospitals. He was recently interviewed by AI Trends Editor Jeff Orr.

Q: For those who are not familiar with OptumLabs, can you describe how the organization relates to the UnitedHealthcare and Optum businesses?

A: UnitedHealth Group is a large organization that is composed of two major companies. One is UnitedHealthcare, which is a benefit provider, also known as a payer or an insurer, that provides its services to a wide variety of employers, communities, governments, and others that administer health insurance. And the other is Optum, a technology-enabled service organization that provides products and services to many, if not most, of the organizations in health care: providers, employers, payers, life sciences companies, individual consumers, and more.

These products and services are all informed by deep expertise in data, analytics, and health care, all of which we call OptumIQ. This unique combination of knowledge and capabilities provides the foundation of solutions in pharmacy care services, behavioral health services, population health management, health care delivery and health care operations. Central to all of this is data. Over the years Optum has developed a major data asset collected from health care insurance claims, electronic health records, and other sources that provide detailed, visit-level, individual health care data on tens of millions of Americans. That data is carefully curated and used by Optum experts to create analytics that provide insight and value for customers, improving the delivery of health care.

Q: If I'm understanding correctly, Optum collects data and uses analytics as an internal capability for the customers it serves. What was the motivation for Optum to use that capability in the creation of OptumLabs?

A: About six years ago, Optum saw an opportunity to help improve the health system more broadly by providing data in a fully de-identified form to a diverse group of

organizations that would not typically have access to that data but would be able to make use of it to do important scientific research and innovation. The work would be focused on transformational change – which we call translation in health care – to create new ways of delivering care, new concepts of care, and new insights into the effectiveness of care. The idea of creating a collaborative organization to use this data to make big improvements in health care was crystallized, along with a co-founding partner, Mayo Clinic, into what was called OptumLabs. That concept has grown to become a much more substantial organization with about 30 partners, and now has many, many different activities underway.

Typically, the organizations that make up OptumLabs are academic organizations, providers, consumer advocacy organizations, disease-related organizations—in heart disease, or cancer, or mental health, for example—and the U.S. government. As partners in OptumLabs, these organizations get more than access to the data. They are members of a collaborative that shares information, ideas and resources. OptumLabs was set up to bring diverse organizations together to work collaboratively because Optum believes that in working together, these organizations could do something more to improve health care than they could do individually.

Optum established OptumLabs because it saw an opportunity to give back to the health system, consistent with its mission to make the health system work better for everyone. While very successful as a commercial organization, they wanted to create something whose purpose was not commercial. OptumLabs was an opportunity to demonstrate that the organization was a thought-leading organization, one that was community- and patient-minded; one that understood the value of leadership and non-commercial research and innovation in health care. As such, OptumLabs is not viewed as a profit center. It is viewed as an investment in health system improvement. We're an organization that is intended to have value and impact as an outcome of what we do. And that value and impact is often provided by the partners that we work with.

Q: That is a great description. Can you share more about the value of data analytics at OptumLabs?

A: Traditional analytics have a lot of value in health care because there is so much waste and inefficiency in the industry. Some estimate that around one-third of dollars spent may be wasted across the entire United States, through a variety of means, including unnecessary and redundant testing, treatment and care, fraud, and inefficient processes and management and other factors.

There is tremendous opportunity to improve what we do in health care. The approach to change that we look for at OptumLabs is: "Can we do some research, understand a problem, and then create an analytic or a new pathway to create change?"

One example of how we've used traditional analytics to do that involves our opioid work. When the opioid crisis came to the fore a few years ago, the entire UnitedHealth Group enterprise recognized that this was something that needed dramatic attention and focus. We began to look at opportunities to intervene. And we came up with several dozen different opportunities.

What OptumLabs realized was that what we didn't have as a nation were good measures, good ways of

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understanding the parameters of the crisis that we were addressing. We didn't have a standardized way of examining and understanding the diverse facets of the opioid epidemic. We brought together our partners and a group of experts and thought leaders from across the country. And we created a program to build a set of about 30 key performance indicators aimed at benchmarking and measuring performance improvement in four main domains of the crisis: prevention, pain management, OUD treatment, and maternal and child health. We also embarked on a range of research projects with our partners to surface insights on opioid use that can drive important changes in plan and business policy within our enterprise and for public health impact more broadly.

Our key performance indicators are now being used extensively across Optum and UnitedHealthcare, having been translated into numerous product and service offerings both internally and externally. We have also made our measures widely and openly available outside our enterprise. Our KPI dashboard was published in the Health Affairs blog, and has been adapted for use by certain states and others. The work also catalyzed new work on several national projects by the Centers for Medicare and Medicaid Services (CMS), the Food and Drug Administration (FDA), and the Centers for Disease Control and Prevention (CDC). They're also being used externally at other payer organizations and by provider organizations to better understand opioid use. This is an example of impact by translating our work to help improve health care at a broad level.

Q: Where did the AI technology, such as machine learning, start to come into play?

A: There's a history of artificial intelligence in Optum and UnitedHealthcare because AI goes back to the 1950s as rules-based expert systems. These kinds of expert systems have been in use for many years to detect fraud, waste, abuse, and a variety of other activities based on knowledge and experience in the delivery of care.

As we progressed in our knowledge of machine learning, we began adopting some newer techniques, and they've been used in a variety of different places over time. We recognized early on that the new deep learning artificial intelligence technique created a potentially significant value around narrative data, such as clinician notes. These types of data have been approached more traditionally with natural language processing (NLP) on text-based information. Optum has a lot of offerings that make use of NLP, and we are beginning to incorporate the newer deep learning approaches in using text data for predictions and classification.

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Q: Could you point to some outcomes where intelligent automation is showing promise within OptumLabs?

A: Some of the deep learning techniques are very powerful for approaching problems that go something like this: When you have experienced physicians or nurses who have made the same kind of decisions or judgments for years, they create a lot of data that can be used for training a deep learning model. A decision is around a process, in which they must read through a patient's medical chart, come to a decision related to that chart, and that decision feeds into a series of next steps.

A good example of such a process might be, "Is a procedure appropriate for a patient?" The prior authorization process usually requires a physician to read through the chart and make a decision; for example,

should a patient on discharge go to a skilled nursing facility or should they go home?

Those decisions, in a big company in which there's a lot of data, have been made repeatedly so that there's a lot of training data with which to build deep learning models. And a small group at OptumLabs, along with an international team of teams within our broader enterprise, have been working on applying deep learning to a variety of processes like these in which they can work alongside of a physician or a nurse who's reviewing the chart.

Q: There is growing concern that machines and physical robots will take away human jobs. Could you expand on the idea of an AI working alongside the health care professional?

A: The idea is not to replace a physician or a nurse, but to use artificial intelligence to perhaps eliminate charts that don't need review by a clinician, and suggest specific charts that could be reviewed manually so the physicians can make the best use of their skills, rather than doing the mundane task of basic review of cases where the outcome is obvious.

Deep learning is going to become very important in administrative use cases, which involve the process of the delivery of care and the payment of care, an area where there's a lot of frustration, a lot of time wasted, a lot of inefficiency, and where there can be issues with quality. We believe that applying artificial intelligence in these settings can address those types of problems.

Q: Wonderful. So you've talked a bit about working with some of the external partners. And OptumLabs is unlike a traditional revenue-bearing organization based on its mission and its partners. How does OptumLabs take that need for measurement and be able to demonstrate the progress towards the goals you've described, which are not revenue-bearing?

A: As I mentioned before, we are not managed as a profit center. However, we do have a carefully negotiated and planned budget, so we do have financial targets, though they're not necessarily the typical profitability targets. We have limited resources as everybody does, and we've determined that impact is the way to think about what we do. We want to be able to point to a change that happened in the health care system as a result of our work.

Change is a process and we know we can't be responsible for all that it takes to do that with the resources we have. So, our focus is on initiating the work that leads to a change. That is illustrated by the example I mentioned earlier in our opioids work. There are also other examples. We recently published two papers in JAMA Otolaryngology showing that hearing loss in adults, typically in older adults, is responsible for substantially increased morbidities, illness, and worsening of existing illness, and also a substantial increase in overall health care cost when you compare those people to people who are otherwise the same but don't have untreated hearing loss.

That kind of observation and information can create evidence that is useful for providers, policymakers and benefit providers. It can help inform the decision-making about the coverage of hearing loss and hearing-assist devices. We are not an advocacy organization and we're not suggesting a particular direction, but we create excellent, well-done scientific evidence that can be used by those people who do suggest directions and by those organizations that need to make decisions.

And if those articles lead to change then we can point to that as impact that OptumLabs had on health care. That impact can be amplified if Optum and any health care stakeholders act on our findings to create value out of some of the impactful things that we identify.

Q: I want to step back and see if some of your experiences can help other organizations that find themselves in a situation of being data rich, yet still searching for the insights; that needle in a haystack. What's the one thing to change their mindset or approach?

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A: What I've learned over time is that the difficult challenges are not really identifying which kind of classification model you're going to use or what kind of analysis you're going to do. The hard part is understanding what the problems are that need to be solved. There is a lot of low-hanging fruit and opportunity in health care because of the excess spending that the industry does. And the outcomes leave a lot to be desired as well. Everything that we do in OptumLabs starts with a deep understanding of health care because we – and our broader enterprise -- are heavily involved in all areas of the health system.

So, we collectively understand what the problems are and the hard questions related to them. Where could we intervene? What kind of change could actually bring value? And if you're thinking of implementing something, how are you going to do that? Is there a way to implement an analysis or is there a way to actually create a process that changes the problem, or intervenes in the problem that makes a difference?

And would that intervention be cost-effective? Because if you're not really working with a serious or life-threatening event, you want to make sure that the things you do are cost-effective. And once you figure that out, you then ask yourself, "What data do I need to be able to address this problem? Do I have that data? And if the data exists, is it good enough?" And then finally, once you understand the problem, know the solution that you're going to put in place, and know that solution makes sense either clinically or financially, you now ask yourself, "What analysis am I going to do?" And then, "How am I going to measure the success of that analysis?"

Q: What lessons could you pass along from OptumLabs' experience to our readers?

A: My advice to people is spend a lot less time thinking about what the user interface is going to be or what kind of AI model you're going to use. Spend the most amount of time figuring out what the important and meaningful problem is. And is there a way to actually intervene in that problem? And once you've got that, a lot of the rest of it will fall in line.

And I don't mean to imply that it's easy to do. You need expertise, to be smart about it, to be thoughtful about it, and you need to be open to being innovative and to creating unique solutions. Often, too much time is spent developing a technology for which companies haven't yet figured out that somebody wants or needs. In medicine as well as in other industries, people show you a lot of analyses. And you say, "Wow, that's a fascinating analysis." What you need to be thinking is "But is it actionable? Is there something I can do with that or do I simply say that's interesting but not helpful?" You really don't want to be in that situation.

Q: Paul, you mentioned being open to innovation. Is that something that the structure of OptumLabs or the mission has allowed you to pursue an innovative culture and have a bit of autonomy while still being fiscally responsible? How can other companies or industries learn from that type of behavior?

A: Well, I think that's an insightful question. We were given an opportunity to be a little less short-term-focused than most business units in companies. And we were given an opportunity to be creative and to be open to innovative thinking. But it's not enough to have that opportunity. You

must have two more components.

First, you must bring in the right people to make use of that opportunity -- people who are disciplined and maintain an entrepreneurial mindset. And sometimes in larger organizations it is hard to identify those people. On the other hand, there are almost always people in larger organizations, who given an opportunity to escape from more traditional linear thinking, will unleash their inner entrepreneur. You have to make sure to find those people for your team.

And secondly, those leaders have to set up a culture. I believe very much in operational discipline, but with a mindset that you're not just thinking the way you do in a traditional corporate setting in which it's all about what the return is on your opportunity. If a company can make the space to actually invest in this kind of innovation, your first driver is not necessarily the return. You've got to create the equivalent or even greater value as an OptumLabs impact. So you need to figure out what is the measure that you are going to use as a gauge?

Optum and UnitedHealthcare are big on culture. All the managers get trained in the culture, we talk about it, it's part of meetings and is infused in everything we do. One of the exercises we do is called "the blue chip." The blue chip refers to the most valuable poker chip in a casino. So, if we accept that as the premise, the question is whether what you're working on is considered blue chip. Is it aligned with and is it important for real impact for something you want to create?

You don't always get to work on everything blue chip, but you always want to have some blue chips that you're working on, and you want to make sure that you at least think about things to see whether they fit in with a blue chip or whether they actually are things that, if you had a choice, you might focus on something else.

Read more about OptumLabs