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Telehealth and Digital Technology

Libbe Englander, PhD

Editor's note: This is the first in a series of articles by Dr. Englander that will discuss different elements of the value chain—where we are today, where there are gaps, and what the most innovative companies are doing to fill them.

Revolutionary ideas are powered by fundamental enabling technologies. Effective, scalable telehealth requires: 1) digital information transfer capabilities, 2) the statistical skills to organize and analyze the data, 3) subject matter expertise to synthesize insights into usable forms, and 4) a compelling delivery mechanism to push the information to patients and other stakeholders.

Conveying Ideas in the Digital Age

Tools are needed for the patient to convey concerns, for the healthcare provider to understand the patient's problem in context, for treatment to be executed, and for society to measure the quality of outcomes.

We're not there yet. Even if legislative and regulatory issues, such as where a doctor is licensed to deliver care, were resolved today there are still major technical hurdles to the growth of telehealth.

Converting Data into an Actionable Plan

Getting the provider the right information about the patient is vital, particularly when there is no relationship, history, or much time for discussion. Better tools are needed to quickly and reliably access patient records, test results, nuanced concerns, and an understanding of the person's healthcare context.

Each piece in the workflow is a computer science challenge. Named entity recognition, for example, is critical. Does this record apply to this patient? Is this drug the same under a different name or spelling? Is this the same doctor who delivered care three years ago? This is not the stuff that sways public imagination, but it is mission critical in quality, traceability, and outcome measures.

Tracking the Consultation to Follow-up

More gripping is the technical problem of understanding and tracking patient concerns and healthcare advice. The key is to translate natural language—what people speak—to definable, measurable and trackable information. Human language is fluid, nuanced, ironic and situational. Even people speaking face to face often miss vital information. But with torrents of data in the form of the unstructured narrative text, it's vital to develop tools that allow us to extract, evaluate and analyze its meaning.

For example, a rudimentary example of telehealth is crowdsourced discussion board content. People with similar conditions discuss their experience with diseases, products, treatments, and healthcare professionals. These discussions make for compelling reading and provide an abundance of information.

However, leveraging these crowdsourced opinions to spot adverse event trends, evolution within standard of care, or changes in patient population demographics in a scalable manner needs to be done programmatically. Data must be collected from relevant sources, aggregated accurately, and processed with natural language processing techniques. Further, it must be stored in an organized manner. Often, collected data will subsequently be analyzed to discover interesting patterns, which are highlighted and presented to the end user via intuitive visualizations.

For example, at Pharm3r, our Boomerang Natural Language Processor™ has been purpose built for extracting meaningful information from digitized healthcare discussions. It is a powerful tool that allows us to translate text containing patient and doctor

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narrative into organized concepts and numbers.

These types of tools must be integrated into telemedicine platforms to create real, scalable solutions for improving resource constrained healthcare systems. Increasingly, multiple people with no single point of care are delivering healthcare. These tools facilitate the creation of an organizational structure around the individual patient. They can also leverage digitized information for storing, tracking, measuring, and modeling healthcare information flow.

In the following series, we'll talk about the different elements of the value chain (Figure 1). We'll look at an ecosystem poised to make an outsized impact on the way we all consume and conceptualize healthcare. It's an industry where actors can range from large pharmaceutical companies to an individual patient posting about their experiences—and include a bevy of technology, regulatory and advocacy groups in between. It's an exciting place to be, and in the next few articles, we'll work together to make sense of it all.

Tags: delivery, digital technology, Englander, organization scalable, telehealth, telemedicine, tracking, workflow

Libbe Englander, PhD, is CEO, Founder at Pharm3r. She can be reached at 646-327-2111 or contact@pharm3r.com, 158 West 88th St. New York, NY 10024

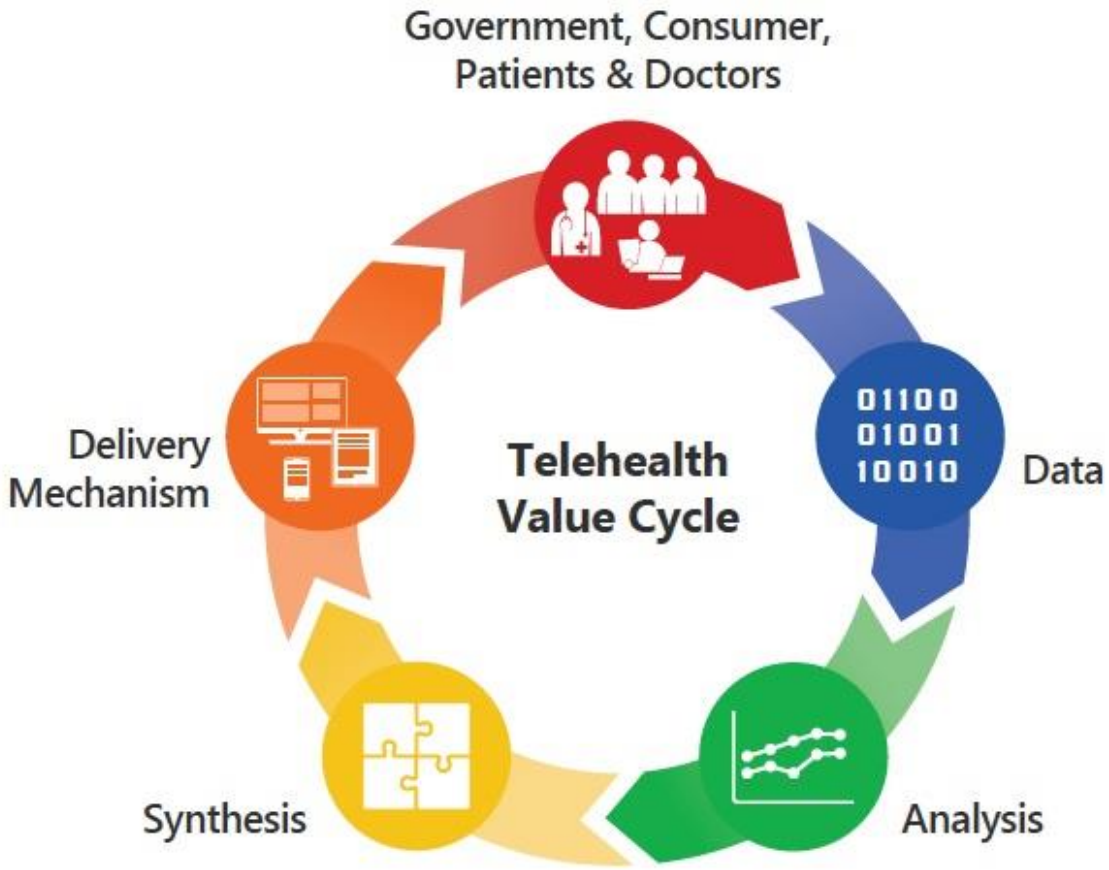

Figure 1. An illustration showing the connectivity among elements of the value chain