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# PERSONALIZED TECHNOLOGY WILL SHIFT THE DOCTOR-PATIENT RELATIONSHIP



# PERSONAL TECHNOLOGY'S IMPACT ON THE PATIENT-DOCTOR RELATIONSHIP

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## TWO EMERGING STRATEGIES THAT WILL IMPROVE HEALTHCARE

There are two emerging healthcare delivery models in the era of wearable technology:

### GOLDMINER

Going deeper in one major medical area

#### DOCTOR DECIDES TREATMENT

Traditional Care Providers:

Doctors  
Hospitals  
Nursing



Benefits: Better treatment and higher medical value

### LOCAL CONVENIENCE STORE

Options for more routine care

#### PATIENT DECIDES TREATMENT

Entrants:

Electronics firms  
Software firms  
Retail and apparel firms



Benefits: Convenience, savings, and preventive care

## THE EVOLUTION TAKING PLACE

SOURCES JUNIPER RESEARCH; PWC, HRI CLINICIAN WORKFORCE SURVEY 2014; IDC HEALTH INSIGHTS 2015

More than 145 million health apps are projected to be downloaded by 2016.



## BENEFITS OF WEARABLE TECHNOLOGY

SOURCES PWC, HRI CLINICIAN WORKFORCE SURVEY; HRI CONSUMER SURVEY 2014

### Patients believe ...



56%  
Increased life expectancy



46%  
Decline in obesity



42%  
Improved athletic ability

### Doctors believe ...



79%  
More effectively coordinate care



68%  
Willing to prescribe mobile health apps



42%  
Comfortable relying on patient DIY tools

# PERSONALIZED TECHNOLOGY WILL SHIFT THE DOCTOR-PATIENT RELATIONSHIP

Personal technology is ushering in a new era of the “house call-plus”: An emerging philosophy in which smartphone apps, embedded devices, and wearable technology are fundamentally changing how and where medical decisions are made and treatment is rendered.

Telemedicine, home diagnosis, and retail settings that treat patients near their home and workplace are other forces bringing sweeping changes to the health-care landscape. Sundar Subramanian, a principal in the health and operations practices of Strategy&, part of the PwC network, says taken together all these trends are creating “a veritable gold rush” in patient data and consumer options that will transform healthcare over the next decade.

“Gold Rush” is an apt analogy, given the amount at stake both in health outcomes and dollars. A 2014 report from PwC, called “The Wearable Future,” found that digital health start-ups had raised \$2.3 billion by the middle of last year, more than they had raised in the entire preceding year. More than \$200 million of this amount streamed into digital medical devices such as wearables, that are empowering patients to take a greater role in their own care.

As the healthcare industry undergoes its digital transformation, immense new profit pools are being created. PwC estimates that up to \$1.5 trillion in spending and \$150 billion in profits are up for grabs. The question is, who is going to grab it and how?

## GOLDMINERS AND LOCAL CONVENIENCE STORE

Subramanian and his PwC colleagues Carl Dumont and Christoph Dankert have identified two strategies for going after this huge market opportunity—Goldminers, who dig deep in one major medical area, and the *local convenience store* (LCS), which offer customized and convenient options to address routine care needs.

Both groups leverage personal technology to render care in new ways, but their underlying philosophies are radically different.

The Goldminer strategy is the province of hospitals, physicians groups, and other vertically integrated players. These organizations want to find ways to better manage care for the heaviest users of medical services, the 30 percent of patients with complex conditions who represent nearly three-quarters of all medical spending.

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“The headlines in the consumer press focus on how personal technology is being used by young, invincible people,” Subramanian says. “The real ROI, at this point, will come from using personal technology to treat complex populations—typically on Medicare or Medicaid programs or both. Such individuals may be frail and homebound, living in long-term-care facilities, struggling with serious mental illnesses, or facing complex medical conditions. In general, complex populations are heavy users of medical care and account for a disproportionate share of costs. For example, just 5 percent of Medicaid beneficiaries account for 54 percent of all Medicaid expenditures.”

Propelled by mobile communication, remote monitoring, and better coordination of care, the Goldminer strategy allows providers to administer care in a more timely way at the patients’ homes, significantly reducing the cost of intervention as well as improving the quality of care.

For example, Dumont says embedded devices and microchip sensors can provide care teams with immediate information, allowing them to react quicker and more effectively.

Initiatives to target specific conditions with personal technology are already paying off. Geisinger Health System, a large, integrated provider in rural Pennsylvania, was able to reduce admission rates by 18 percent for its diabetic population using remote monitoring and other channels of communication. In addition, readmission rates for diabetic patients plunged by 31 percent. As a result, Geisinger saw a total cumulative savings of 7 percent.

“A fundamental shift is already taking place in healthcare where focus is now on segmenting populations, and thinking about the whole-person care for the individual within each segment,” Subramanian says. “The successful Goldminer will focus on achieving medical value and good medical outcomes addressing the whole-person care needs for the individual.”

While such an approach can bring huge medical and economic values, the PwC analysts point out the Goldminer strategy simply extends the traditional healthcare model, where providers make most of the decisions, and patients follow their instructions.

## NEW ENTRIES INTO MARKET

The LCS strategy, in contrast, re-envisioned how healthcare is provided, and focuses on empowering consumers and improving their experience, changing the roles of both the people who provide care and those who receive it. Fittingly, this transformation is being led by new entrants into healthcare, such as retailers, software and electronics firms, and apparel companies. Incumbent insurers are investing considerable resources to catch up, too. All of them want to create a better patient experience by empowering consumers with detailed, personalized health information and advice, which allows the patient to take a larger role in managing his or her own care.

The PwC analysts note this approach can be “profoundly disruptive,” since it circumvents the doctor-patient relationship and gives the patient greater choice and more control over how and where he or she receives care.

To contrast the two approaches, the PwC analysts give the example of a woman who has random heart palpitations, an often-frightening condition where the heart feels like it’s beating too fast or slow, fluttering, or skipping a beat.

In the Goldminer approach, the patient might be enrolled in a preventative care program and equipped with a phone app that constantly monitors her cardiac activity, providing information to the clinical care team to fuel their decisions.

The personal technology allows care to be delivered outside the traditional settings. For example, the patient could receive a video call from a nurse or social worker. This has the dual effect of changing the traditional series of tests and appointments, which affects how revenues are generated, while also reducing the risk of costly surgeries or emergency room visits.

While such improved health outcomes are invaluable, the technology does not change the traditional relationship between the patient and caregivers. The patient, by and large, has minimal participation in treatment decisions.

In the LCS approach to the woman with random heart palpitations, though, the patient is firmly in the driver’s seat.

The same patient could purchase a lifestyle and heart-monitoring app for her cell phone, which would allow her to maintain control over a huge amount of relevant data, such as exercise, diet, sleep, and medications.

Rather than rely on health providers to analyze the results and provide a course of action, the patient could use the app itself to find ways to improve her condition. For example, the information collected by the app might detect a correlation between some of the patient's medications and the heart palpitations.

## The personal technology allows care to be delivered outside the traditional settings.

The patient would be the one who decides whether to send the data to her doctor, to experts at the app provider, or to a computer that could analyze the results. The app might suggest the patient set up text-alert reminders of her medication schedule, so a designated contact could monitor her status after she takes the medication.

While such choices improve the patient's medical care, they also represent potential sources of revenue. For example, the PwC analysts imagine a subscription service that uses an implanted device to determine an imminent heart attack. The patient could be alerted to this impending problem and take action, such as sending a 911 message to summon an ambulance. In this patient-empowered model, the patient is the one who controls the data and makes decisions based on the information provided to her.

Such scenarios are not hard to envision—in fact, the PwC researchers note such technology is already available in various forms. A patient can purchase a device from the mobile health company Alivecor, which tracks the electrical activity of the heart with an electrocardiogram (EKG) via a smartphone, giving the patient options to have the data shared with and interpreted by doctors and third-party vendors.

In addition, analytics firms such as WellDoc and BlueStar provide self-management programs, through mobile devices that monitor blood sugar and advise diabetic patients. The impact of such efforts is significant and can reshape traditional care models. The PwC analysts estimate that nearly \$200 billion a year could be saved by 2025 by letting Goldminers (such as hospitals and outpatient settings)

control populations more holistically. An additional \$200 billion could be saved by shifting care to LCSs (retail settings at pharmacies, retail stores, and other locations).

## DOCTOR-PATIENT RELATIONSHIP CHANGES

The empowered patient may even choose to crowdsource a diagnosis in a forum such as CrowdMed, introducing another change to the traditional sequence of rendering care, the PwC analysts say. Movements like electronic health records have both improved the standard of care and reduced the need for patients to have conversations with their doctors, which can be another wedge in the doctor-patient relationship.

However, the PwC analysts believe that while the relationship between patient and caregiver will be changed by personal technology, it doesn't need to be fractured. "People make a mistake of thinking that technology is going to be a magic bullet that solves everything," Subramanian says. "The doctor is still going to have an important role, though it's not yet clear how technology will change the doctor's role."

Technology has already fueled changes in the interactions between patients and physicians. Doctors have become accustomed to patients arriving in their offices with a few pages printed out from the Internet, for example. The new world is different in that personal technology arms patients with specific, relevant information, allowing them to participate and orchestrate their own care in ways that would have been unimaginable only a few years ago.

By next year, 142 million medical and health apps will be downloaded, according to Juniper Research. And two years after that, some 65 percent of consumer healthcare transactions will be made using mobile devices, predicts IDC Health Insights.

Large healthcare providers are not sitting by idly. IDC Health Insights forecasts 70 percent of healthcare organizations will offer some combination of virtual health and wearables by 2018.

Both Goldminers and LCSs will need to make large investments in mobile health and analytics to reap the benefits of personal technology. The new health ecosystem relies on capturing specific information for each patient, before and after diagnosis, which can be translated into immediate

action. Goldminers will be challenged to coordinate care across the home, primary care, and specialty care settings.

Even as both traditional healthcare providers and new players enter the terrain of personal health technology, measuring the ROI and payback of these efforts can be challenging. “Revenues and profits will drive this,” Subramanian says. “When you make a bet on a Goldminer or LCS approach, you need to have your eyes wide open and have a clear idea of your business model. At the same time, we are in a period of enormous flux, so you need to be flexible.”

Technology advances and heightened calls for better customer service are only two of the reasons the health ecosystem is in such flux. Current healthcare providers are also under pressure from the federal government to change their business models. The Affordable Healthcare Act of 2010, the expansion of Medicare, and the growing population who qualify for Medicaid are making the federal government a potent force in spurring a reimagining of healthcare as well.

## **NEW BUSINESS MODELS**

As healthcare organizations ponder how to embrace the Goldminer and LCS approaches, Subramanian says they often have enormous pressure to justify their current business models. Consequently, they often focus on how to integrate personal technology into those models, thinking that alone is transformative, but potentially putting barriers around what they can achieve.

The technology advances have such potential to upend the traditional ways that healthcare is provided that companies have to be open to a re-envisioning of every aspect of how they operate. “The incremental approach is easier,” Subramanian says. “The difficult thing is deciding if an incremental approach is enough.”

Even as business models remain uncertain, plenty of experimentation is going on, the PwC analysts say. For example, the Banner Health Network, which operates in Arizona, provides patients with ways to track health outcomes, motivating them to manage their conditions better as well as share in the savings from doing so. XG Health Solutions—a Columbia, MD, health consultant that scales innovations from the Geisinger Health System—provides solutions that standardize and optimize clinical practices, leveraging research and analytics.

For their part, the LCSs are pushing the discussion with approaches like Teladoc’s remote medical care, delivering advice through mobile devices using texts, emails, and video calls. PatientsLikeMe is one example of a digital forum that allows patients to share experiences, insights, and support. Along the same lines, CellScope allows parents to attach an otoscope (the device that doctors use to look in someone’s ear) to their smartphone. A parent who is concerned that their child has an ear infection can take a video and send it to an on-call physician, receiving a diagnosis (and if needed a prescription) within two hours.

As patients exercise more control and have more options about their care, healthcare providers will be pressed to provide greater value to their relationships with customers and demonstrate a greater understanding of the patient’s needs.

“Today, a patient sits in a waiting room for 30 minutes, and then waits for another 20 minutes in the examination room before seeing a doctor,” Subramanian says. “In a consumer-focused model, you could allow the patient to have a video consultation at his or her convenience, so all that waiting time is eliminated.”

However, the next wave of personal technology could play an even larger role in enhancing customer service. For example, the provider could capture patient preferences, allowing the doctor to know that his next patient, John Smith, tends to come to appointments with a list of questions. The doctor could gather those questions in advance and have answers ready.

The PwC analysts believe Goldminers and LCSs will not be an either/or approach. “We believe the future model will be coexistence between the Goldminers and LCSs,” Subramanian says. For example, LCS providers could sell technology to Goldminers, who provide that technology to patients.

The PwC analysts point out that the potential for industry destabilization puts every healthcare provider at risk, and will pressure every healthcare provider to create a future that is more virtual and intensely personal, and that renders care closer to the patient’s home. The new form of “house call” will require healthcare companies to focus on new types of collaboration, new business models, and develop a crystal-clear understanding of their place in the healthcare value chain.

## **ABOUT THE SUMMIT**

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