

The Changing Patient in the Digital Era: A Typology for Guiding Innovation in Healthcare

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Ten years ago, the word "blog" would have drawn puzzled stares. The iPhone was inconceivable. The inventor of Facebook was 15.

To understand the impact of the explosion of digital and social media technologies on healthcare, it is important to understand how these technologies are changing the consumers who use them. Today's unrelenting technological progress is providing consumers countless new ways of receiving and distributing information and content that was not available years or even months ago. Consumers' increasing use of media to learn, interact, and connect with others on demand is changing their expectations for access to information and connection in all areas of their lives – including healthcare.

As consumers change their expectations, new businesses are emerging to meet their every wish, even every potential wish. Healthcare is no exception. Patients, families and caregivers, and individuals interested in wellness find themselves in a marketplace that is changing by the month. They have access to a wealth of new information sources, new services, new ways of connecting with each other, and new "health apps" (applications) across multiple devices — all designed to put them in charge of their own healthcare.

At times medical professionals can experience their digitally-savvy patients as irritating. Most healthcare providers are familiar with patients who arrive at medical visits with a potential diagnosis derived from a website that has little to do with an accurate assessment of their condition. However, as websites offer increasingly sophisticated interactive assessments and tools, often sponsored by medical associations (The American Heart Association, The American Cancer Society) or developed by physicians, patients are entering with better questions, with a clearer perspective on their health challenges. These patients may have an enhanced understanding of the actions required from themselves as well as from their doctors. Patients' "digital life" can become a useful adjunct to their in-person visits with medical staff in a healthcare facility

In addition, as more and more patients are being seen for long-term, chronic conditions that are strongly influenced by their lifestyle choices outside of medical treatment, the digital world can serve as a useful partner in care. The choices patients and their families make when they are at home, at work, or in other locations, may affect their health as much as the treatment choices made in the medical office or hospital. For those with Internet access, the digital world is always there for them. Patients can take advantage of monitoring devices, sensors, useful information, or support around the clock, from any location.

What we are witnessing is nothing short of revolutionary, not just in terms of technological advances, but also in terms of the shifting attitudes, expectations, behaviors, and culture.

Digital Media as the Driver of Exponential Change in Healthcare

The recent wave of new technology is strongly influenced by the exponential growth of microprocessor speed. Intel co-founder Gordon Moore hypothesized that processing speed of integrated circuits would double in speed every two years, while halving in cost and size. This relentless year-after-year development has led to unprecedented product turnover in very short periods of time. A product or service that is dominant today can be obsolete within a year or less.

Exponential change is often hard for humans to understand. Many innovations have changed humanity profoundly throughout our history — agriculture, the printing press, the internal combustion engine — but none of these discoveries were based on microprocessors. They did not double in speed every two years. A page from Intel's website urges readers to consider, "In 1978, a commercial flight between New York and Paris cost around \$900 and took seven hours. If the principles of Moore's Law had been applied to the airline industry the way they have to the semiconductor industry since 1978, that flight would now cost about a penny and take less than one second."¹

A Transformational Moment

Sometimes so much change occurs that it leads to a "state change." Warming ice melts and becomes water. Water grows hotter until it changes into steam. The same kind of state change can happen with

products and services, with information and its delivery, and even with customers and their expectations.

Consider the lifecycle curve of a product or service (See Figure 1). The first curve dips down as the product requires initial investment before it "rounds the curve" and begins slow growth. If the product is successful in its marketplace, it enters a phase of rapid growth. Finally, over time, its growth may begin to slow, plateau, and even decline. While a product may disappear altogether, there is also the chance that it will be re-invented and transformed into a whole new form. Think of the horse and carriage giving way to cars. The core product was still transportation, but it was delivered within a whole new form.



Figure 1. Lifecycle Curves for a Product, Individual Business, Whole Industry, or Shift to a New Era¹

The shift from one product lifecycle to another is quite familiar, as products follow each other in increasingly rapid succession. Records gave way to 8-Track tapes, to cassette tapes, to CD's, to MP3 players, and now to mobile devices that download a full range of multi-media entertainment and education from the web. The transformational shifts are coming faster and faster.

This same kind of shift can take place in a business, or even in an industry as a whole. The introduction of the iPod and online music downloads changed not just one record company, but the entire industry. Apple Computer recently changed its name to Apple Inc., in part to signal the fact that it is now one of the world's largest music retailers. New technology and the services integrated around them can restructure an entire industry, where every business within that industry feels the impact.

At unique moments, an even deeper shift occurs that affects all industries at once — a shift in eras. Think of the agricultural era giving way to the industrial era. Industry after industry was transformed at once, in parallel. Not only was the nature of work redesigned, but the way people saw themselves and related to one another was deeply affected as well. Mass production and centralization of work in cities deeply impacted workers' roles, identity, family relationships, as well as communities and culture as a whole.

Today, we are at the cusp of another shift in eras. The world is moving from the Analog Era to the Digital Era and this change is having profound and wide-ranging effects. Information that was linear is now interactive and mobile. Content has moved from one-way narrative to participatory. Conversation is everywhere, in all forms. A wide-ranging global conversation has begun.

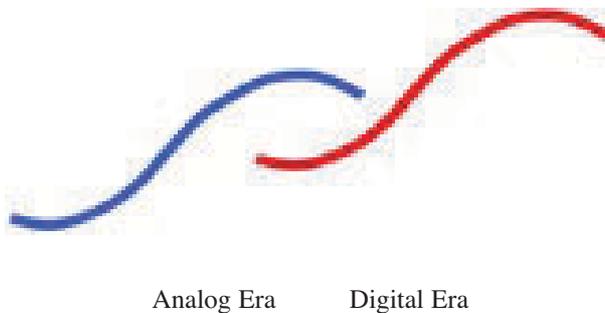


Figure 2. A Shift in Eras

Notice that the two curves overlap. In a transformational time, the mainstream majority is still on the traditional curve, while the second curve is growing quickly, signaling future growth.

To understand what this powerful shift means for healthcare, it is first important to understand what it means for healthcare's customers.

Changing Technology, Changing Customers

The shift in eras is not only a technological shift. In a transformational time, people change as well — in their expectations, their mindsets, their needs, in what they value, and how they connect to each other. It is a change in culture.

As technologies change, people change. Customers who used to be happy with a cassette tape with eight songs per side can now wear a device the size of a tie clasp that holds thousands of songs. A smartphone enables users to make calls; keep years of photos; watch videos, update their calendars, contacts, or work files; send text messages to friends; access all parts of the web for information on news, local events, travel, stocks, weather; as well as track research about their particular health concerns while keeping watch on their own health behaviors and statistics. Connection to friends, family, work, the world at large is easily and constantly at hand.

The same devices that began as media and communication centers are now growing into mobile health resource centers as well. Individuals can now carry constant connection to healthcare information, support, and even to accessible providers in their pocket or purse, making healthcare information available anytime, anywhere.

These new capabilities change customers — change what they expect and what they value. If healthcare organizations understand these changes, they can design services and offerings that create compelling value for patients in the digital era.

The Four Digital Customers

To better understand these changes and the opportunities they present, we developed a simple typology for understanding patients' evolving needs. As we studied how individuals were changing in the digital era, we identified four major emerging mindsets that we call the Four Digital Customers:

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| • Ana | (for Analog) | Passive and Open to Guidance |
| • Andi | (for Analog-Digital) | Interactive and Engaged |
| • D.J. | (for Digital Joe or Digital Jane) | Empowered to Act |
| • Syndi | (for Synthesizing) | Connected to Community |

Humans have always exhibited these mindsets, but the digital revolution is bringing them to life in significantly expanded and sometimes entirely new ways.

While imagining these four customers as four individuals helps to illustrate the concept of differing mindsets, in reality every healthcare customer exhibits all four of these mindsets at one time or another, usually many times a day, sometimes even in parallel.

There are times when we want to be passive, when we want to sit back and let the experts decide. There are times when we want to be interactive and engaged. There are times when we want to create, to be productive and make decisions for ourselves; and there are times when we want to feel connected and part of a community. Understanding what motivates the four mindsets of patients in the digital era can help healthcare organizations understand their marketplace on a much deeper and more meaningful level.

Ana

Ana is the most familiar digital customer — she is the traditional patient that healthcare providers have been serving for decades. Ana is happy to come into the healthcare facility for diagnosis and treatment, hoping for guidance from an expert. Ana willingly accepts a passive role and comfortably lets the expert medical professional lead the way. She values high quality in all the "service moments" that are part of diagnosis and treatment, and she likes to be nurtured and cared for.

Even as many patients and family members take on the additional digital mindsets, the Ana mindset rarely goes away entirely. Anyone might be an Ana at times, particularly when ill. There are times when it is helpful to be able to lie back and heal, to turn to the professionals for authoritative expertise and reassurance.

The recent boom in healthcare technology can make it seem that providers are already effectively serving the four mindsets, but it is important to make the distinction that simply moving content online does not necessarily make it more interactive, engaging, enabling, or community-building. Online content can be provided to patients and families just as in-person medical advice is provided — where the patient remains in the role of passive recipient of wisdom from the professionals. Digital, electronic communication may make the communication more accessible, or it may involve multimedia and be entertaining, but the approach is fundamentally the same. When patients and families are passively taking in information a doctor has "prescribed," this is a case of using technology to better serve Ana.

Healthcare companies have spent over a century and billions of dollars perfecting their approach to this customer, to Ana. The way these medical providers have excelled at appealing to Ana is a major achievement and important to their success. But issues arise when the healthcare providers stop at just satisfying Ana while ignoring the other three digital customers.

Andi

Andi is playful and interactive. He is not a content or information creator, but instead likes to engage with content and information created by others. Andi likes to interact, to rate and rank, to mix and match, or to comment and recommend.

For example, Andi may rate songs, books, TV programs or movies, or even products, on any number of websites. He can assign five stars, four stars, or maybe only one, and explain his reasons why. Andi can create a list of favorites or add his comments to someone else's list.

Today there are many opportunities for Andi to interact with healthcare content. Andi can search for medical information for conditions, treatments, medications, side effects, prognosis, expected outcomes, or even information on providers. WebMD is an obvious choice for information that Andi can explore on demand, but there are more sophisticated choices as well. PubMed, a website managed by the U.S. National Institutes of Health (NIH), provides a free digital archive of biomedical and life sciences journal articles. Andi can sift through a wealth of research and download the information most relevant to his concerns. "Apps" for the iPhone and other mobile devices help Andi sign up for information services that offer the latest research and tracking tools for most common health conditions. Tablet computers promise to offer even more.

Andi can search for information on providers as well. Websites such as Yelp, Revolution Health, HealthGrades, or state government quality reports aggregate ratings online. Andi can research any provider or healthcare group or organization, and can add his own experience. He can rate and comment on any aspect of care — office visits, treatment, wait times, courtesy and communication, negative side effects or positive outcomes.

The digital world now offers many tools Andi can use to monitor his own health and interact with his own health data. If his doctor offers electronic medical records, Andi can typically log in and chart lab results over time. Andi loves to track the graph of weight, blood pressure, or cholesterol, as the numbers head up or down.

Perhaps most important of all are the major new web-based services, such as Google Health and Microsoft HealthVault, that allow users to gather all of their medical records in one place; store their records securely online; and then choose add-on services that link to their records to offer personalized information and support. Large pharmacies in the U.S., such as Walgreens, CVC, Longs, and Walmart, will download all prescription information into these services. At the most basic level, users can see all of their medical information in one place and have access to it anytime they want. For the more adventurous Andi, health apps can analyze the data and give him easy access to second opinions, relevant news, and suggested steps for reducing health risk and increasing wellness.

Finally, there are a growing number of medical devices Andi can use at home or can wear that wirelessly link with the online medical records and track vital statistics. Andi can monitor his heart rate, blood pressure, blood sugar, oxygen levels, weight, steps walked, or miles run. These online records can then signal Andi or his medical providers when a measurement needs attention and can give recommendations for next steps.

D.J.

D.J. wants to be enabled and empowered. In media, D.J. would create his own content — music, photos, videos, or a blog. In healthcare, the content D.J. creates is his own health and wellness. He wants easy access to expert information so that he can be in charge of his own care decisions — and

new digital health providers are scrambling to be of help.

Once D.J. has all of his medical records on Google Health or Microsoft HealthVault, there are a growing number of services and devices that give him capabilities he never had before. D.J. can now sign up for personalized information services such as Daily Apple and others that will deliver the latest research and recommendations personalized for any conditions, treatments, or medications listed in his medical record. CareOpinion will send out free alerts highlighting any gaps in care and Health Butler will examine his records to remind him about prevention steps he needs to take or appointments he needs to schedule.

D.J. can even order tests he never had access to on his own before. He can connect with online doctors to order his own lab tests through Quest Diagnostic's Blueprint for Wellness or WebLAB's Physicians Wellness Network. He can go to DNA Direct, 23 and Me, Navigenics, and other online genetic testing services to check his DNA to understand where he might be at most risk for disease. At-home medical devices, such as Intel's Health Guide, extend his diagnostic reach, offering a blood pressure monitor, glucose meter, pulse oximeter, peak flow meter, and weight scale that all can send information wirelessly to his online chart.

D.J. can also choose to talk to a doctor whenever he wants, on his own schedule. Teledoc will offer him a consultation with a board-certified, licensed physician. Mayo Clinic will offer him "actionable recommendations," while MDLiveCare and Cleveland Clinic's MyConsult service can connect him by webcam so that doctor and patient can see each other. His Intel Health Guide device has two-way video capability built in as well.

TrialX can help D.J. find relevant clinical trials related to the conditions in his chart. Intel, GE, Philips, Bosch, Honeywell, and many small start-ups are developing systems for monitoring elders in their homes as well. And several services will help D.J. understand the finances of his care and will recommend steps he could take to find the same care at a lower cost.

D.J. consults the experts and goes to them for treatment, but he is definitely the director of his healthcare journey.

Syndi

Each of the first three digital customers focuses on the individual. In contrast, Syndi is focused on others. Syndi wants to be a part of a community. She wants to belong. Syndi likes to connect with others to share and co-create. She is all about synergy, about bringing people together to accomplish something none of them could do alone.

Syndi can be a participant in virtual groups or networks, but can also create networks as well. She likes to convene community.

Syndi in healthcare can now find an in-person community or an online social network in almost any area of interest. Members post links to the latest research and to journal articles — often as soon as articles are published. They post their own evaluation of treatments, of medications, of providers. They have message boards and chat rooms for the topics of most interest, for relaying their personal stories, for giving and receiving support, for encouraging each other. There are calendars of relevant events, links to opportunities to advocate or fundraise for the cause in question, and links to a range of resources — often evaluated and ranked by members as well. In the larger social networks, anytime day or night, another member will be online to offer information or support.

If a social network does not already exist, Syndi can start a new community around any health interest of choice by starting a blog or starting a group on Facebook, MySpace, Google, Yahoo, LinkedIn, or a similar social networking service. She can grow the community by creating a YouTube Channel or can develop a following through Twitter or any number of other online services. The new group can be closed or open, local or global.

In some instances, members of online communities may have in-depth knowledge that their local medical providers may not yet have. For example, a large U.S.-based organization for patients and families at risk for genetic breast and ovarian cancer called FORCE (Facing Our Risk of Cancer Empowered) offers information, research, support, an annual conference, and local communities for in-person meetings. Participants within these groups are well-educated about their genetic risk. They understand that women who test positive for a BRCA gene mutation face an 87% risk of developing breast cancer, and a heightened risk of ovarian and other cancers that can affect men as well. However, the use of genetics is not yet well-integrated into mainstream medicine. A recent study from Massachusetts General Hospital showed that medical staff had only discussed this issue with ten

percent of their patients who were at high risk³, patients whose health could depend on this information. Online communities such as FORCE support patients and their families to learn the information essential to their health; to get genetic testing when appropriate; and to work proactively with their physicians to pursue options for screening and prevention. In this case, Syndi's membership in an online network could be life-saving.

Implications for Innovation Strategy of Healthcare Organizations

Healthcare innovations in the digital era do not necessarily mean simply producing new digital content, or even digital solutions, for patients and families. When thinking about healthcare services of the future, it is most important to understand the evolving mindset of the customer, to understand how customers' use of media and other technologies is changing their expectations for healthcare. The danger is that organizations try to offer digital services but actually still offer them within the Ana mindset, keeping their new services within "the first curve" of the lifecycles shown in Diagram 2.

An example from another industry might help illustrate this point:

When the people of the BBC (the British Broadcasting Company) first considered innovation for the digital age, they quite naturally began to think about digitizing shows, about the clarity and beauty HD TV would bring to their programs. As we worked together on their innovation strategy, it became clear that while this advance would offer an important benefit for Ana customers, they also needed to consider the needs of Andi, DJ, and Syndi customers. What would be of value to customers who wanted to interact and engage, to become enabled and empowered, or who wanted to connect with others and feel part of a community?

Given these needs, the BBC created tools and platforms to make it easier for users to interact with media and even to create and share their own content. Radio One listeners were offered the chance to tag songs or to vote for the music they liked most, while the on-air station would play their favorites. Multiple programs were set up to provide a venue for DJs to post their own news reports or commentary or to post their photographs, blogs, podcasts, and videos. New web services offered individuals ways to connect with each other around the topics they cared about most. The BBC expanded its mission to include not only being expert in providing information, education, and entertainment, but in enabling their audience to provide these as well. The boundaries between broadcaster and audience began to blur and new forms of interconnections are still being invented each month. In its current charter, the BBC looked ahead to a future "where the historic one-way traffic of content from broadcaster to consumer evolves into a true creative dialogue in which the public are not passive audiences but active, inspired participants."⁴

How will healthcare meet these same challenges — to renew itself in the digital world? What services are possible now that were never possible before, and what kinds of interactions will patients and families expect from their healthcare providers because they are so accustomed to them elsewhere?

Clearly many new web-based businesses are emerging to offer digital solutions to meet the evolving needs and possibilities. At the moment of this writing, there are over 1400 iPhone apps in the category of Health and Fitness, and more are added by the day. There are even more listed under the category Medical, which also includes mobile apps for medical providers. Apps created by businesses, individuals, or doctors offer tools to track weight and nutrition; gather the latest research on conditions such as heart disease, diabetes, asthma, etc.; gather information on medication effects, side effects, and drug interactions; tools to increase and track fitness and exercise; meditation tools to reduce stress — the list goes on. At Google Health, Microsoft HealthVault, and the iTunes store, the number of new companies and individuals offering health information and services grow each day. Many of these new providers are individual practitioners or small companies, getting their start in the new healthcare economy.

Other emerging providers in the new world of digital healthcare are large companies that have not been considered healthcare providers in the past. Just as Apple became one of the world's largest distributors of entertainment and education, important new providers in digital health are technology companies such as Google, Microsoft, Cisco, and Intel. They are not diagnosing and treating people in a traditional sense, but they are aligning the infrastructure to become the places where patients and families turn to find providers and access information throughout their treatment process. These large global companies are working to help individuals and families manage their own health.

With new entrants into their marketplace, how can traditional healthcare organizations make sure

they are meeting the needs of their customers in the digital era? Today, many hospitals and medical centers are initiating electronic medical records and adding tools that patients can use to see their own information, learn about conditions and treatments, and even track changes in their lab results. This digital foundation then becomes the platform that enables the next generation of information and services.

In addition, by paying attention to the mindsets of customers, not only to the technology, many organizations are also finding low-tech ways to meet their patients' needs for increased interaction, empowerment, and connection. While Ana, Andi, DJ, and Syndi are influenced by the digital world, they do not need only digital solutions.

One of our clients, a hospital working on innovating its services for the digital era, was waiting for delivery of furniture for a new nurses' station on one of its medical-surgical floors. In fact, the furniture was already on the truck ready for delivery. But as the staff on this floor worked with their hospital's transformation team, they realized that the modules they had ordered were designed to create a barrier between patients, families, and the nurses. There were walls of shelves and patients and family members could only contact nurses through a small opening in the center of the front wall. As they began to consider their changing customers in the digital era, they recognized that this station was now an important symbol of their commitment to a different future. They changed their order.

In their new design, this group not only created a nursing station that was open, inviting individuals to interact with medical staff, but most importantly, they also redesigned the space in front of the nurses station. They installed a "healthcare concierge," a staff member who sat in the center of this highly-visible open area, who worked to support patients and family members to play a more active role in their own care. Patients and families began to spend time learning more about their illnesses, understanding their own role in recovery, and connecting with a wealth of helpful resources. The initially drab waiting area became a lively, interactive environment. Feedback showed that individuals felt involved and valued; they were more likely to follow up appropriately; and health outcomes improved.

While this example increased the level of patient and family engagement, imagine the next level of enhancement possible by connecting to the growing world of digital healthcare. Patients and families can now monitor their health through multiple devices or sensors, and can track their progress over time. They can integrate this information into their health record and can access it whenever they want online. Once patients own their medical chart, their comprehensive "health portrait," they can share it with others as they wish. A whole world of healthcare providers is beginning to approach them to offer second opinions, access to testing, and advice about the destinations where they could receive the care of their choice. Based on their own individual medical information, they can get recommendations for care at facilities with the fewest medical errors in their area of interest, that is rated most highly by other patients, that is most cost-efficient, or that is considered state of the art.

However, as patients and their families become more engaged and empowered Care Partners, the marketplace offers them more tools and possibilities every month. The rapid growth in new devices, tracking programs, and providers reaching out to them can become confusing for patients and families trying to manage their health. How can their own doctors and healthcare providers serve as trusted guides through the world of new possibilities?

To lead patients through this new world of digitally-enabled healthcare, providers need to understand this world themselves. How can providers engage patients and families in their own care? At a time when there is a powerful new meaning to "home health," which new tools and services might be most helpful? Within their own organization, what kind of new departments or providers would be needed to educate and guide patients, or their own staff, in a rapidly changing healthcare technology environment?

Patients and families will inevitably look to their current healthcare providers for guidance at the beginning of this new era. It is a defining moment. Will healthcare innovators be willing to redesign their delivery of services and their organizations to lead the way?

Conclusion: The Era of Patient as Partner Has Arrived

Healthcare leaders have talked about the patient as partner for over two decades. As healthcare enters its "second curve," moving into the digital era, new tools and services are empowering patients in ways never possible before. The impact of digital technology in all areas of life is leading to a culture change where more and more individuals want to interact and engage, to become empowered and take control,

and to share information and connect with others. Innovators in healthcare must begin to think about and design services to meet the needs of the four types of digital customers — of Ana, Andi, D.J., and Syndi — if they hope to remain relevant and connected to digitally-enabled patients and families. These are still the early days for healthcare's move into the digital era. It is a time when healthcare innovators must define and chart the path into new territory, a time when leadership is essential. The age of the digitally-enabled Partner in Care is on its way, and everything we see today is only the beginning.

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