

Digital Transformations in Healthcare Organizations

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ABSTRACT

Technology has been transforming healthcare in several innovative ways. Being Digital is no more a choice in current era but a norm. Technology and hence digitization is imperative as organizations look at new ways to improve healthcare. Digitization is a key enabler of large scale and sweeping transformations across multiple functions and provides unparalleled opportunities for value creation. Evolution of IoT offers the opportunity to fundamentally reinvent medicine, health care ecosystem and delivery of e-health services to consumers at a faster pace. With technology changing so rapidly and widely, each and everyone in this eco system need to be upto date with the technology trends and be at the forefront of this change. It is no secret that healthcare is expensive. Cost reduction is a major driver of many healthcare initiatives and incorporating Artificial Intelligence, Machine Learning, advanced analytics is no exception.

1. Introduction

Recent changes in the healthcare industry and its surge towards value/evidence based medicine, combined with implications of Affordable Care Act have confronted payers with the dilemma of controlling costs while maintaining profitability. Healthcare industry is catching up rapidly in digital space delivering value to the payers by finding enhanced customer experience, reduction in administrative expenses, providing better care to the members and reduced backlog of claims. US healthcare expenses have gone from 5% of GDP in the 1960s to nearly 18% today. Competition is also one of the factor driving digital initiatives at pace and the trapped customer model that left healthcare companies stuck with limiting technologies is nearing an end, whether incumbents are ready for the change or not.

“To survive”, healthcare must invest and innovate – Forrester.

Artificial Intelligence is already in healthcare ecosystem:

- Visual pattern recognition software for identifying various conditions
- Machine Learning in robotic surgeries to study mechanical motions for humans
- Cognitive systems automating claims, edit, reject incorrect claims
- NLP helping coding accuracy and clinical documentation improvement

Big Data adoption for speed to market, performance & Quality improvements, Proactive vs Reactive related to Fraud Waste Abuse.

Digital Transformation modernizes healthcare in such strong ways that it touches everything right from patient enrollment to smart diagnosis and finding self-care tools.

Below are some of the key industry drivers for Digital Transformation in Healthcare Industry:

2. Fraud and Abuse Management

Fraudulent claims cost billions of dollars to Payers annually. Payers are continually challenged with limited resources to adjudicate growing number of claims day by day. At same time, they need to continuously make an effort to monitor for any suspicious claims which can cause significant revenue loss and additional efforts to recoup them. As the costs associated with health care coverage reach unsustainable levels, existing or traditional methods to combating fraud, waste and abuse become increasingly inadequate. Identifying new patterns of irregular behavior is a tedious and time taking process, requiring many analysts to compare reports from different sources before they can confirm a new behavior.

3. Reduced Costs and Optimized Healthcare

Major drivers of health care costs are due to unnecessary administrative costs, high prices for health care services that are being rendered, defensive medicines, reimburse for the procedures performed rather than outcomes based, readmission rates, and high-cost patients. Analyze patient characteristics to identify the most clinically and cost-effective treatments. Enhance the success of Payer-Provider partnerships, provide faster payment of legitimate claims, identify early high risk patients and suggest wellness programs to bring down the cost of care.

4. Enhanced Member Engagement

Newer models of patient care require increased responsibility and engagement from patients. In the increased competitive landscape of the global health insurance market, payers had to offer services that they want and move towards value-based care. The historical FFS (Fee for Service) healthcare system was designed to be paid for doing more, not for performing of managing care better. Member and provider incentives were not aligned to promote health outcomes, lack of coordination and lack of integration across the care continuum. Value-based care was focused on pay for value, not the volume. Rewards for quality, health outcomes, patient

satisfaction and efficiency. Gain 360 degree view of members to assist in identifying and addressing customer service problems. Utilize wearable device data to monitor adherence to treatment regimens. Publish data on medical procedures to determine the care protocol, services rendered and promoting enhanced care. Members expect easy access to service systems, faster resolutions to request for assistance and evidence of payer's care towards members wellness.

5. Data Explosion

As healthcare becomes more and more of data-driven industry, there is an increased need for data availability to leverage and combine financial data with clinical data. Growth is coming from new member enrollment, claims, transitioning the data to electronic records, storage requirements and publishing the data by various techniques. In the future, because we know that data is being used on daily basis, we are going to see that data will definitely explode exponentially.

Affordable Care Act was the another biggest thing to hit healthcare industry in the past 100 years with many regulations, changing constantly, driving enormous burden in managing large volumes of data.

In the era of emerging personal health technologies, it is important to answer key questions:

- How many of you are using/have used Fit-bits or an equivalent device to manage their wellness?
- How many of you think that personal health technologies will disrupt the healthcare ecosystem?
- How many of you have built some kind of services on top of such products?
- How to provide greater choice, lower cost, and better access to Consumers?
- How to shift from illness focused care to Wellness management?
- How Robots will transform healthcare?

6. Personal Health Technologies

Healthcare industry has evolved over a period and made rapid significant technological advances in the field computing, machine learning, IoT, nanotechnology, wearables and electronics that are helping reshape the industry. Below few technological advancements:

- With Robotic care, Doctors can already remotely control telepresence robots from a faraway office. Robots can increasingly transport medicines, supplies around the hospitals and clinics.
- Nanorobots: on a smaller scale, tiny robots will be able to travel through the bloodstream, monitor vital signs or even perform minor surgeries.
- Companion Bots: These bots are well used to monitor, diagnose and companionship for elderly at-home care to check daily vitals, medication intake, exercise guide etc
- Smart Rings: These are lightweight rings for monitoring sleep patterns, 24x7 fitness tracking, and online security.
- Smart Pills: This new technology that can let doctors better monitor patient's overall health. Generates

alerts based on drug ingestion, helps gain data from additional across the population

There are about 30+ technologies that are available in the market today starting by location of use like at-home, near the body and on the body. Internet of Things (IoT) is an idea that all the technological devices can be connected and use the internet to share the data between each other. Companies are able to take wearable device data, get real time information about patient's physiological responses. Machine Learning is the ability of computers now to analyze the data, make decisions bases on data and patterns.

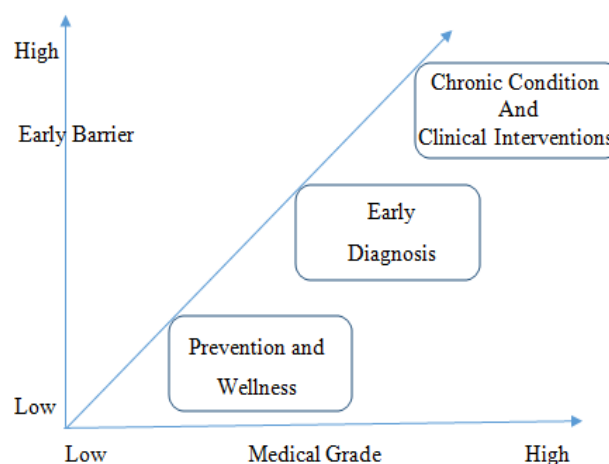
"According to CCS insight, 245 million wearable devices will be sold in 2019"

7. Impact on Healthcare costs and emerging consumer needs

Apart from managing health and wellness, personal health devices are also disrupting the healthcare cost significantly. Few of the examples are in terms of savings from claim costs by using wearable based programs, savings for members through one of the health plans HSA product. FDA approved early diagnosis is emerging as a major disruptor of healthcare costs since the approvals are received at rapid rate, Smart pills, ECG on Apple watch, Non-invasive Glucose monitors, Intelligent smoking cessation devices that are in trials.

Digital adoption increased across all channels and members across all age groups. Influence of digital capabilities plays an increasingly important role in member stickiness. Members are increasingly adopting wearables to manage health, willingness to share data digitally, and are more inclined towards advanced digital shopping capabilities. At home technologies such as Social Bots, Virtual Personal Assistants and Chat Bots have already demonstrated use cases across all of the consumer need categories.

Focus is shifting from wellness to early diagnosis and chronic condition management.



As the technology matures to be qualified as "Medical Grade" and regulations becomes more supportive, personal health technology will increasingly address consumer needs

around early diagnosis and chronic condition management disrupting healthcare costs. Consumer needs can be categorized into Prevention & Wellness, Early diagnosis, chronic conditions and clinical interventions. Below are few questions to ponder:

- Help me manage my wellness
- I want to take control of my health
- Alert me when something is wrong at early stages
- I want to check my symptoms
- Need continuous monitoring of my health
- Help me find a treatment
- Help me compare costs and quality of providers
- Help me in connecting with provider remotely

8. Key challenges and inhibitors

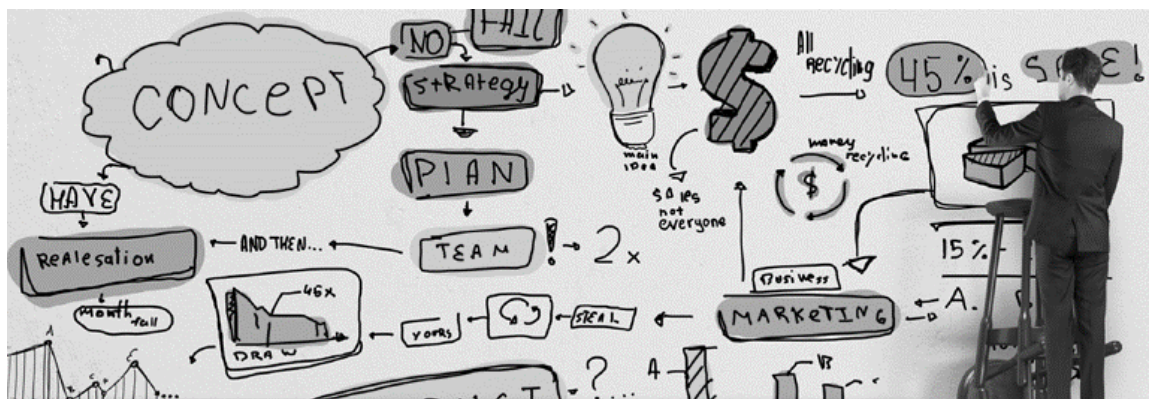
Healthcare organizations still have to navigate through a variety of inhibitors to fully realize the personal health technology. One of the major challenges in hospitals and healthcare systems is the issue of physician integration. There is a major shift from volume based purchasing to value based purchasing, instead of being paid to do more, being paid to do right providing better care at lower cost with highest possible quality. In order to do that hospitals and health systems realize that they have to align with physicians differently since the physicians are responsible for directing that care. In the world of healthcare, sustainable quality to patients is the key and matters the most. However, as we shift towards value based care from volume based, quality of care plays significant role than in the past since it directly affects revenues. If quality of care fails to meet certain standards & regulations, healthcare organizations will suffer from penalties.

- **Healthcare privacy** remains to be an ongoing concern. In the face of growing numbers of complex regulatory requirements, it is imperative to find a way to protect information and systems while giving ever-growing number of accesses and data that is needed. Equally challenging is to protect the information from intruders, external & internal threat and identity theft.

- **Lack of interoperability** of silo-ed data, nothing is more important for patients or others to share information that is been a common message. Advanced clinical systems provide a wealth of on-demand knowledge for providers, but this knowledge is kept siloed and separated. Even though technology has evolved and new tools were innovated, there are still some challenges exists currently that may have made adoption slow.
- **Data accuracy and legal liabilities** – Information has been a vital element of all aspects of healthcare starting from choosing the plan, identifying the coverage, benefits, quality of care, making certain personal health decisions. These all depend on timely, accurate and secured exchange of information between entities to ensure data is not lost.
- **Missing incentive models** – new models of payment, ACOs, bundled payments, and value-based purchasing are increasingly shifting financial risk to the providers. Incentive and penalties are tied to the quality of care being rendered.
- **Thrive through changing regulation** – the post-reform health system requires stronger government program operations and regulatory compliance management. Continuous government mandates and market forces have made complexity increase and regulatory adherence and compliance costs soar. Nearly ½ of nation is in a heavily regulated government programs like Medicare, Medicaid, Exchanges with baby boomers entering every day. More regulation and rule changes than ever before seen in the healthcare industry. New regulation mean many healthcare payers understandably lack knowledge competency.

9. Call to Action or Approach to handle the hurdle

Focus towards Innovation HUBs. Many health organizations have started to invest in technology innovation HUBs to accelerate the technology innovations.



- Why – Focused effort on problems and opportunities that matter most
- What – Technology labs that drive innovations in structured and measurable manner
- How – Cross-functional teams, tools, best practices, funding and governance.

Innovation HUBs can operate focused on specific theme or archetypes based on organizational priorities and an established innovation charter. Medical adherence & Chronic condition management towards Patients, remote monitoring & telemedicine for providers, Health & wellness, member incentives, wearables for members, Operation automation, artificial intelligence and Block chain for business operations.

Although this may seem like a privacy and security risk, Block chain and other data safety enablers will provide the protection required for entire industry to share data and collaborate in new and exciting ways. As Artificial Intelligence & Machine Learning enhance human and robotic decision-making, these blinking red lights will be auto-correcting, with end users simply notified there was an issue and how it was resolved.

These Innovation HUBs can be setup based on variety of operating models. Overall approach would be to establish the future first by gathering inputs from multiple sources to identify opportunities that need innovation, to synthesize and prioritize the ideas for further refinement. Leverage the potential of digital capabilities, emerging technologies like IoT, Cloud, AI/ML, emerging business strategy like shift from volume based care to value based care.

Operationalize through a digital POD structure focused on product and accelerated delivery of AI solutions to gain deeper insights into patient's data. POD can consist of many healthcare consultants who can provide industry insights, assess the market and define solutions.

10. Conclusion

Healthcare organizations from around the globe are turning digital technologies into strategic assets. Future of

healthcare is all about being digital. With constant changes in the regulations, revolving patient experience increasingly favors digital technology and platforms. Healthcare players are aggressively shifting priorities for sustained growth. Investments are driven by value-based care, consumer demand for retail-like experiences and competitive pressures on hospitals. Technology is now very accessible and capable, consumers are becoming accustomed and expecting of chat and voice alternatives. Providers & Payers both see consumer satisfaction as primary metrics for measuring success of consumer engagement initiatives. The arrival of digital assistants, powered by natural language processing, ambient computing and machine learning is changing healthcare, and it's not just the physicians who are using them – everyone in the healthcare ecosystem is benefiting including nurses, technicians and patients as well. The healthcare industry remains among the fastest to adopt the Internet of Things. The reason for this trend is that integrating IoT and wearables into medical devices greatly improves the quality and effectiveness of service, especially for chronic conditions. Many of the organizations are actively piloting AI in a variety of ways – improving diagnostics through image studies, distilling massive amounts of data used in population studies, identifying infection patterns for proactive diagnosis, studying the quality of hospital networks or doctors at delivering optimal patient care.

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