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Emerging Technologies that can revolutionize Healthcare IT

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Healthcare industry from Provider, Payer to Pharmacy are striving to deliver higher quality at lower cost. The Healthcare pundits are persistently working on finding ways to improve patient care and reduce the cost. The Healthcare IT companies are analyzing terabytes of data to find different ways to reduce cost of Healthcare and developing news ways to deliver patient care. The patients are now giving more importance to staying healthy in order to reduce the overall Healthcare spending. According to the Journal of the American Medical Association, the primary reason for the rise in Healthcare costs is due to the increase in the price of drugs, medical devices, and hospital care. While these factors of rising Healthcare cost will continue to grow, there are other operational spending and wastage in Healthcare which are usually given lesser priority in organizational improvement planning. For example inefficient payroll and overtime can cost millions. A hospital with $200 million in annual payroll with just

2% deviation in scheduling and unnecessary overtime is a wastage of $4 Million a year. Same is the case with supplies and shipping expenses on overnight shipping. The IT infrastructure in both provider and payer consists of number of disparate systems, a combination of modern and legacy systems requiring an extensive integration framework. This contributes to a huge IT operational expenditure. A simple system upgrade in such environment can run for months after months and way over budget. In addition to these overheads, whenever there is a new regulation or a compliance, the cost of change multiplies as they need to be implemented in all the systems. Use of conventional revenue cycle management process and clearinghouse is another factor in such wastage and operational overheads.

This decade has seen some innovative technologies changing the world, making it better, efficient and more interactive. From self-driven car to mobile wallet, new technologies are changing the way of our life. Two such technologies have the potential to be a game changer for Healthcare. They are **Internet of Things (IoT)** and **Blockchain**. These two technologies together can revolutionize the Healthcare industry.

Internet of Things (IoT) has already started playing a major role in healthy living through wearable devices. A Fitbit can automatically send physical and workout data to primary care physician or hospital, an apple watch can automatically warn you when you try to savor the juicy steak at your favorite restaurant. But IoT has moved way beyond wearables and has shown the potential to revolutionize all corners of Healthcare. While the big vendors like IBM's Watson Health, which has partnered with number of companies including Apple, J&J, Under Armour etc. to provide a platform for patient centric excellence in Healthcare, there are many other areas of day to day operation that can be improved through the use of IoT and thereby reducing operational cost.

Prescription drug abuse and use of expired medicine is a big problem in our society. According to a study from CNN Money, drug abuse in America costs $42 billion in treatment and loss of productivity, and $8.2 billion in criminal justice. The Health insurance companies are losing around $10 thousands per incident. According to CDC, nearly 36 thousand die in drug overdose. A day is not be far from reality when IoT enabled reusable containers can track the drug and consumption of drugs, sends necessary warnings to patient, pharmacy and primary care physician for any overconsumption or abuse. Similarly a smart bed at hospital can alert the nurse to adjust the bed rails to protect the patient from falling. Using IoT, smart scheduling of resources, nurses etc. can optimize the resource utilization and reduce the overtime and operational costs, yet improving efficiency. Smart inventory can improve inventory management, reduce operational expense and unnecessary shipping or overnight shipping costs.

IoT can play a major role in population health. It can be used to collect data in real time from a global population and mine that data for studying drug side effects, diseases, etc. in real time. It can efficiently and continuously monitor chronic disease patient under home care. Above all, all these information can automatically be fed in to the EHR to fill any information gap.

Now let's look at Blockchain Technology. Blockchain technology evolved with Bitcoin and currently primarily used for Bitcoin based financial transaction. However the concept of Blockchain can fundamentally change the way we manage and share data; and has the potential to move beyond financial sector. It will not be a surprise if Blockchain technology in future rewrites the way we manage information and make the traditional database technology obsolete. Blockchain is a distributed architecture that maintains the integrity of the data while the data continuously grow. The technology is based on blocks that hold timestamped batches of valid transactions. Each block includes a hash reference of the prior block to link the blocks together. These linked blocks form a chain, with each additional block reinforcing the blocks before it in the chain. This Blockchain technology has the potential to change the way we manage and maintain Healthcare information. In the first week of May, 2016; American Enterprise Institute fellow resident Scott Gottlieb presented the idea of use of Blockchain Technology in Healthcare to US Congressional Committee - US House Committee on Energy and Commerce's Subcommittee on Health, and suggested that Blockchain applications could fuel next-generation health and insurance data systems.

Blockchain can change Healthcare data management in number of ways. Last year we have seen a number of data security breach and HIPAA violations. For example, data breach of nearly 78 million sensitive patient records at Anthem, security breach of 10 million member records at Excellus and cyber-attack at Premera. The Blockchain technology built on cryptography, digital signature and verification at each level can be the solution for all data security issues in Healthcare. The access to the necessary data blocks in the chain can happen only through appropriate approval and digital signature verification. All the stakeholders in the Blockchain ecosystems are appropriately verified. Any attempt from unverified source and unverified data block cannot get into the chain, and thereby maintaining data integrity. While Blockchain technology can be a game changer for Healthcare data management and can be a solution to data breach, there are other applications of Blockchain in Healthcare which can reduce Healthcare cost and eliminate outdated technology. One of the key feature of Blockchain in the world of Bitcoin is the elimination of middleman for financial transaction. In Healthcare revenue cycle management, EDI transaction between Provider and Payer, Healthcare billing; there are involvement middleman such as Clearinghouses, medical billing and coding. The Blockchain can eliminate the need for all these middleman or modernize them to reduce overhead cost associated with them. Another key area is Medicare and Coordination of Benefit. US government loses approximately $60 Billion every year in Medicare fraud. An intelligent

and tactical use of Blockchain technology can drastically reduce this loss and minimize Medicare fraud. The coordination of benefit will also become much easier as both Medicare and secondary commercial payer being part of the Blockchain ecosystems will be able to see the same verified data blocks and will be able to make accurate payment.

These two emerging technologies - Internet of Thing and Blockchain can revolutionize The Healthcare industry and has the potential to disrupt the system for better. The potential for both these technologies is so big that the playground will not be just for a handful of big players. Even the big vendors will need to partner with multiple smaller vendors with technology niche and business function knowledge. As we enter in the second half of this decade, we will see number of startups with deep functional knowledge in key areas of Healthcare and strong technical expertise offering different solutions around IoT and Blockchain in Healthcare. We could already see that when Healthcare giant Phillips partnered with Blockchain API provider startup Gem.