AI | HEALTHCARE

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October 2, 2018	State of Artificial Intelligence in Healthcare

Faced with spiraling costs, increased demands and decreasing resources, healthcare desperately needs innovation. But innovation alone does not equal adoption or use. The Partnership for Automation and Innovation in Healthcare (PATH) is an alliance of stakeholders working together to improve care and build efficiencies through use of AI, automation and robotics. These technologies have already transformed banking, aviation, and entertainment allowing each to grow, provide higher-quality products, lower costs and provide consumers greater choice. In all there were over 23 presentations on subjects such as healthcare delivery systems for tomorrow, the advent of robotics in telehealth, bonified successes in Radiology, and legal and policy issues surrounding the use of advanced AI, the transformation of large health systems with technology innovations, and venture capital investment initiatives.

Artificial Intelligence-Healthcare

STATE OF ARTIFICIAL INTELLIGENCE IN HEALTHCARE

## CONTENTS

AI CURRENT STATE IN HEALTHCARE | ONE

Why do we need Artificial Intelligence in Healthcare today? Three overwhelming drivers in our society today are forcing demand for better quality, healthier populations, and affordability. With over three trillion dollars spent each year here in the United States, we are at odds with the number of diminishing practitioners in very critical fields like radiology, oncology, and ocular, with physician burnout which in some cases have reached as high as 50%. The need for clinical support such as AI, can help with the fatigue, overload and critical investigations that have become the norm in healthcare practices today.

The landscape for AI excellence varies depending on the practice area as expected with notable advances in the high cost and moderate risk areas like Radiology where CMS reimburses for the added proficiency achieved from having AI summarize findings in seconds for the radiologist to pass judgement. Notably the largest gains have come from this sector, where computer aided detection as it is called (CAD) have added as much as 30% productivity. The takeaways from this somewhat more mature practice area are that success comes from flexible Machine Learning algorithms with large data sets and well labeled data, high quality optic systems and more attention to applied sciences and not just data analysis.

The reality is with all the gains made, there are still the nagging head winds like the need for diversity of data for more representative findings, overall consistency, and the high cost of algorithms that are often "brittle" are a few that can neuter AI potency. Other successes included using AI in Ocular medicine to manage diabetes and retinography related healthcare cases. The solutions presented were varied, multi-faceted and highly creative to the point of auto-rounding robots that would supplant the physician in daily practice. These healthcare applications represent the best today and support the troika for healthcare excellence, that is make it clinically relevant, high quality and affordable.

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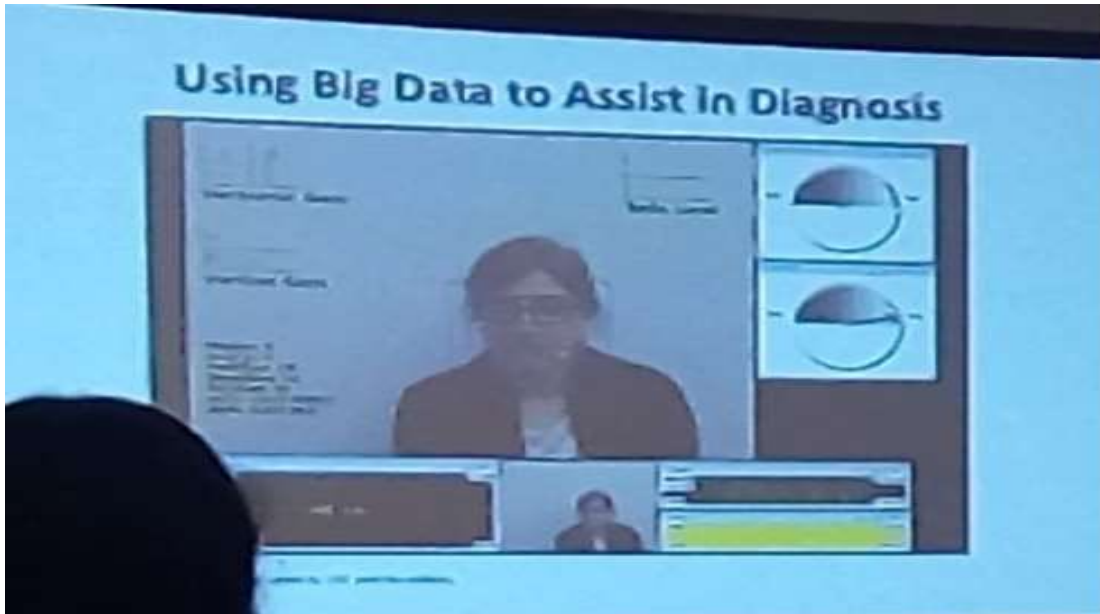
Big Data as CAD for diagnosis used to determine the emotional state of the patient via telehealth.

WHICH AI OPPORTUNITIES ARE A GOOD FIT? | TWO

Ask these two questions, that if a person can do the task and if a group of people can do the task, then it would be an opportunity for AI to automate or replace a percentage if not all the people was the answer from a machine learning expert. Healthcare practices follow the same logical approach as many of the challenges are similar. The need for high quality, automation and affordability is applies anywhere. One notable company was the Care Angel program, *where virtual nurse assistants with integrated AI offers autonomous nursing attention in such a way could support the efforts to improve bedside care in the prenatal area* and certainly worth further investigation for possibilities. It augments and educates to how perinatal nursing could be more tailored, conversational engaging and using necessary notifications to improve outcomes.

https://www.careangel.com/care-angel-virtual-health-assistant
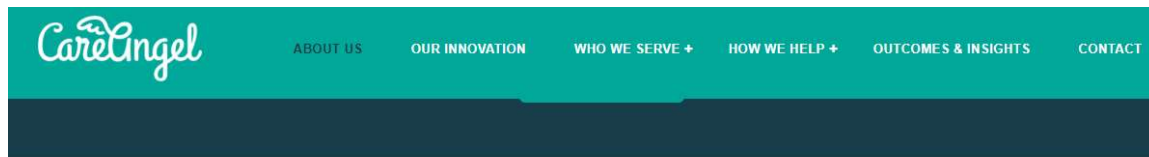
Our Difference: AI and Voice, Delivers the Industry's Highest Engagement

AI and voice reduces costs and complexity

Many of healthcare's problems are exasperated by a lack of complete, accurate and timely information. Technology and automation can address these problems, however static, non-adaptive technology results in low adoption and conversely, technology that involves complicated devices or expensive hardware, loses appeal among users. We connect simply, starting with a simple telephone call.

A broad view for opportunities were neatly summarized by the forward-looking vision presented by the corporate giants in this industry, General Electric and IBM. For IBM, led by Dr. Kyu Rhee for Watson, has invested over $18 Billion and have over 13,000 users. All things healthcare are opportunities for IBM. They did point out challenge areas: Fragmented data continues to create chaos and higher operating costs. Interestingly IBM coined the terms "Augmented Intelligence or Actionable Insights" taking a position very much like what OBIX has been espousing about DSS.
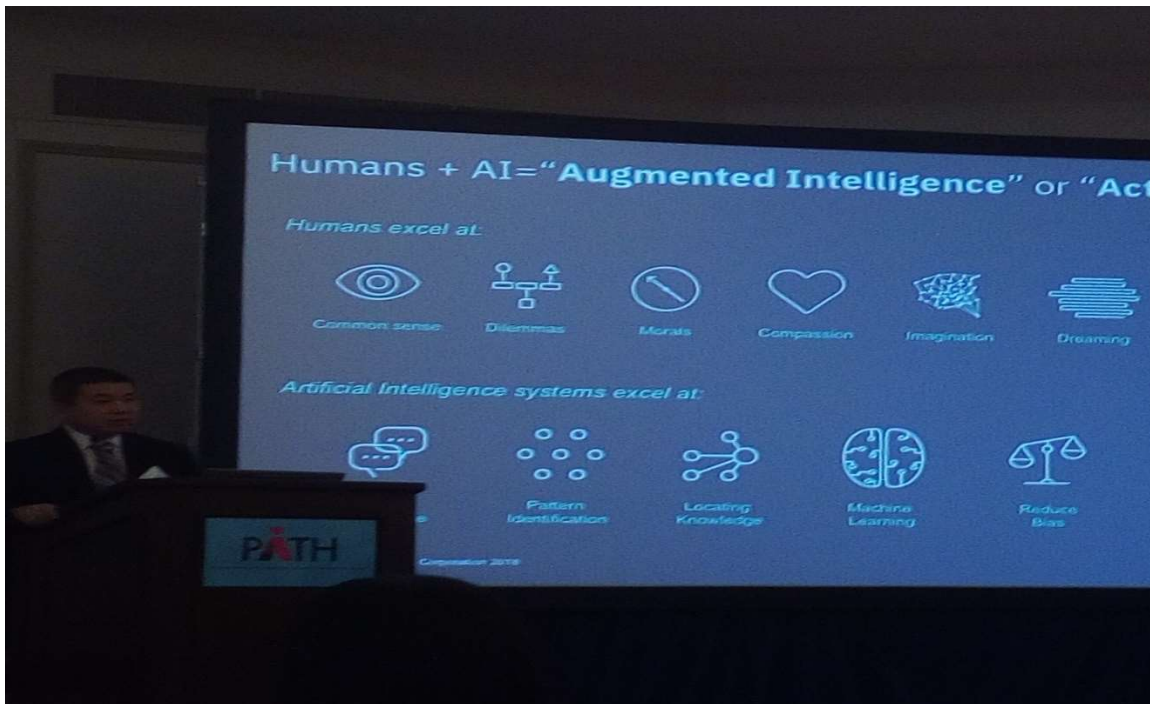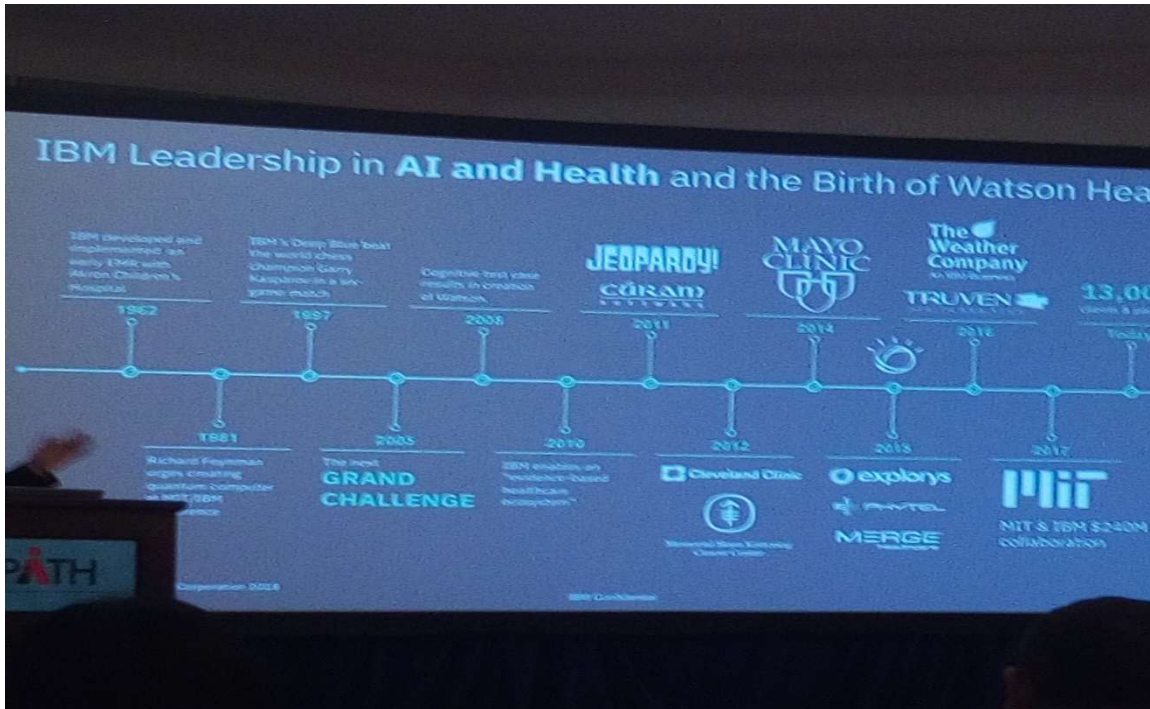
Mr. Travis Frosch, Sr. Director Analytics, General Electric sees opportunities in leveraging their eco system of over 1MM connected devices across the healthcare enterprises. Termed as precision healthcare, they are embedding AI into their local devices, and of course right at the bedside. The approach sits more firmly on what is called the EDGE or IOT (internet of things) and harnesses the on-premise infrastructure - using the cloud as a last option for processing and delivery. **OBIX may want to note this leading GE trend to use the cloud as the last option, as the implication that the cloud solution versus may have certain limitations in changing regulatory practices.**
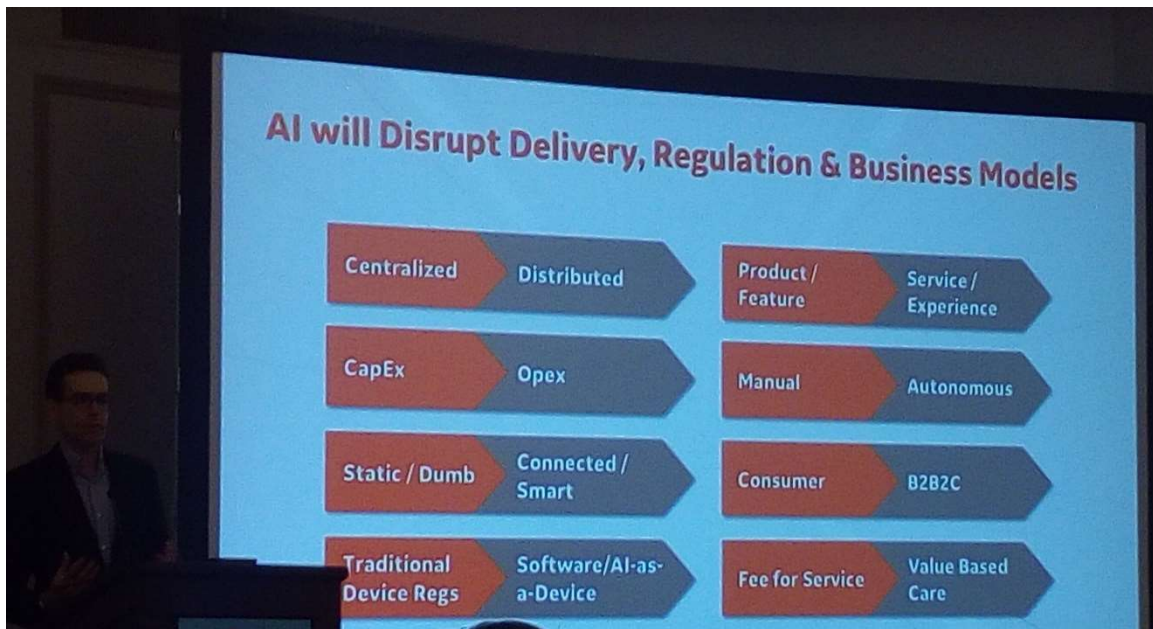
## HOW TO ESTABLISH THE CAPABILITIES TO IMPLEMENT AI? | THREE

Essential fundamentals need to be in place, and especially with data storage. Historically, you follow the trend of what technology is plentiful, as with low price storage that is making bigger data affordable and machine analytic tools more productive. The healthcare environment is ready and rich with AI capabilities depending on the practice areas, and though the challenge remains with the need for quality data and simpler transformations - the productivity gains are there for those who have engineered offerings that support relevance, quality and affordability. Data relevance is expensive and requires tremendous analytics. GE collects 1Gig per bed per day and only uses 3% of the harvested data.

The key takeaways for implementing a solid AI program is to have not only great data, flexible algorithms, and great humans to make insight actions, but having the eco systems and native infrastructure to facilitate the implementations and administration for longer term gains and sustainability.
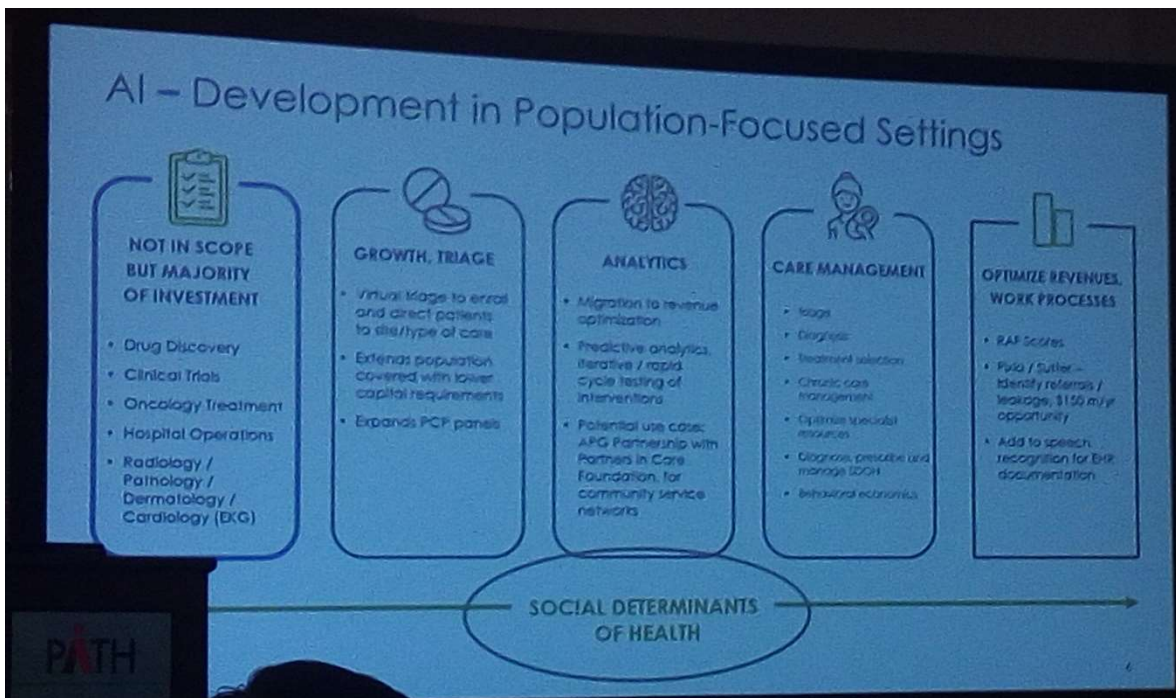
Government represented by the FDA and ONC are taking an active role in regulating machine learning, a sub set of Artificial Intelligence. The new bill presented by will hold developer companies accountable for transparency and full accountability for the algorithms and data integrity. For more detail on the introduction of AI bill "H.R.4625 – FUTURE of Artificial Intelligence Act of 2017" in the House of Representatives, refer to the bill https://www.congress.gov/bill/115th-congress/house-bill/4625/text
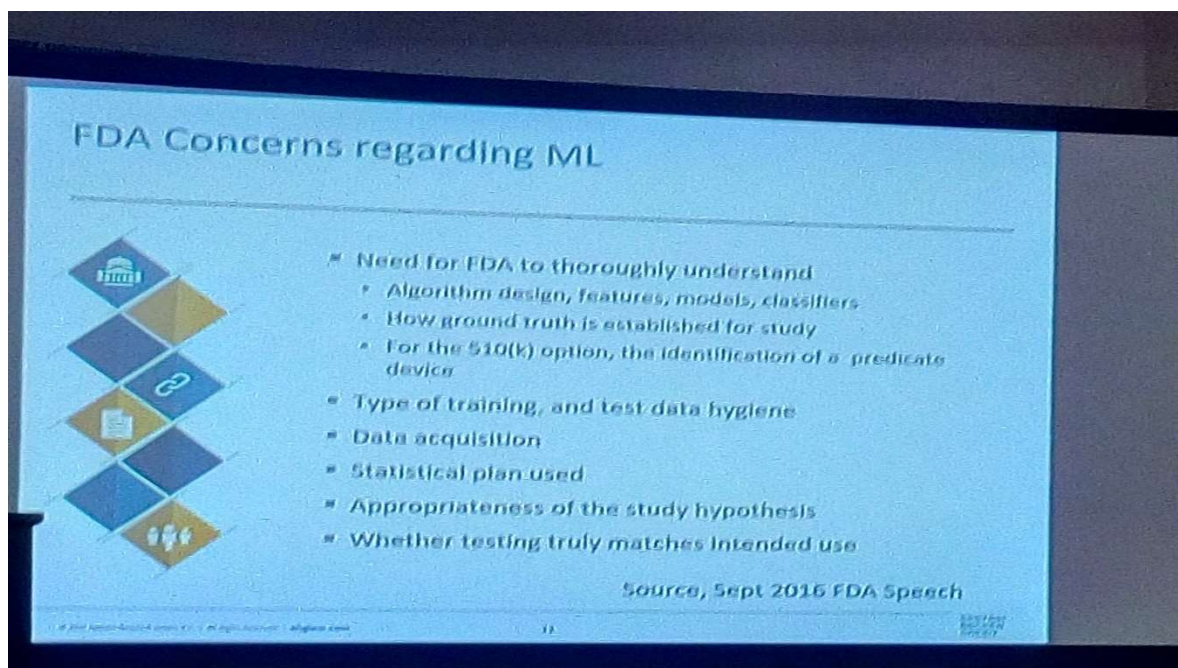
WHAT SKILLS ARE NEEDED FOR AI AND MACHINE LEARNING? | FOUR

Most STEM workers in programming, development and engineering have the fundamentals to work, be trained, and contribute in this type of quantitative environment. The important skill set is business management to guide practitioners and users beyond the hype, and to the opportunities with real business value. As in other industries, Healthcare faces similar challenges to find relevant and usable resources and skills in its diverse practice areas. Interestingly, when questioned about the skills necessary, Don Rucker, MD, and the National Coordinator for Health IT, a government concern, showed his concern for the lack of local tech talent and the need for more math majors to enter the industry. No surprise here. His concern is the growing clout of foreign companies like Huawei who have become a formidable challenger to Nvidia, a leading US AI chip manufacturer.

In the future the complementary skill sets necessary for the AI Healthcare market revolves around the ability to harness machine technology that do well with questioning, pattern recognition, locating knowledge, machine learning and reducing bias with the very human skills no computer can replicate yet, **such as common sense, compassion, imagination, dreaming, morals, and dilemmas.**

## BEST PRACTICES AND LESSONS LEARNED? | FIVE

There is no place for the black box applications in the healthcare practice. Complete transparency for all matters, information and processes are critical and rapidly the norm for all practitioners and providers. Clear explanations on the constraints and bias, and subsequent relevancy for results must be explained and justifiable when challenged legally in court. We can expect more regulation and tighter guidelines like that experienced in

the insurance industry where competing companies that provided collision estimating software needed to produce the same cost estimate for an accident. While there were many takeaways, as each was subjective to the topic and practice area, the over-reaching philosophical is to transform healthcare for

- Better patient outcomes
- Alleviate clinical burdens
- Make more affordable / feasible

From the tactical view, it is about the data, flexible algorithms, good ethics in practice, and having clinical relevance. And finally, it is about getting through the hype of what technology can and really do for the healthcare business in hard business terms.
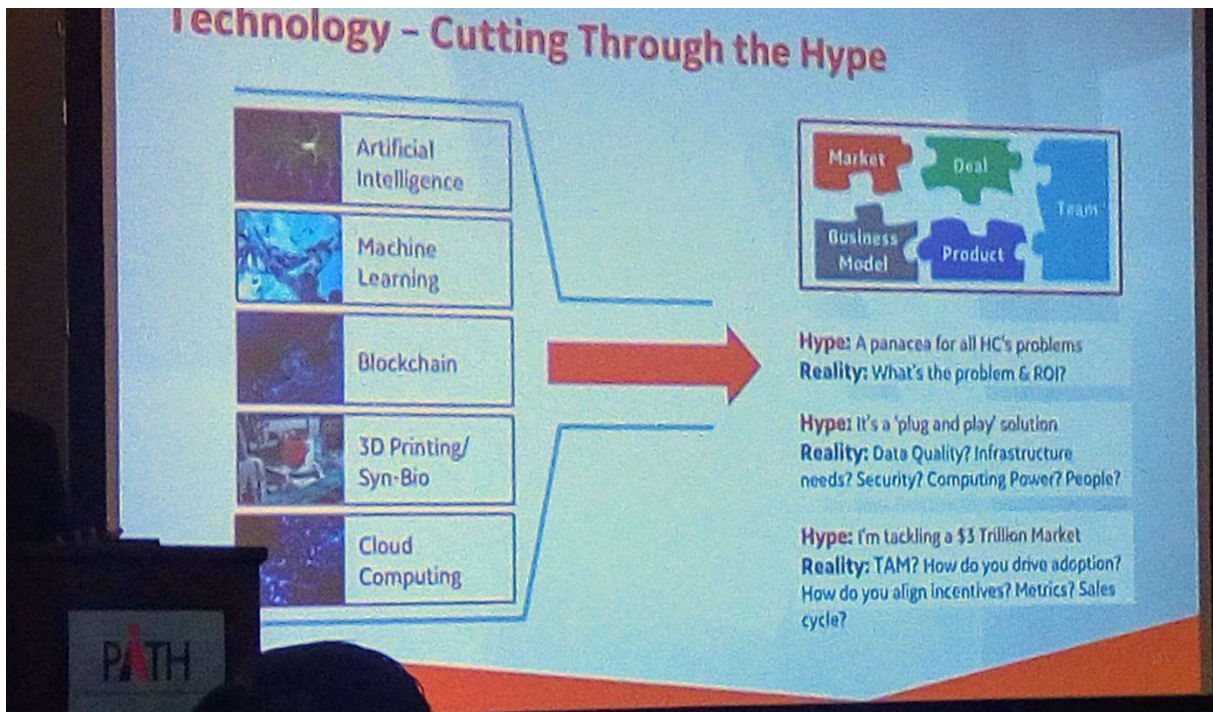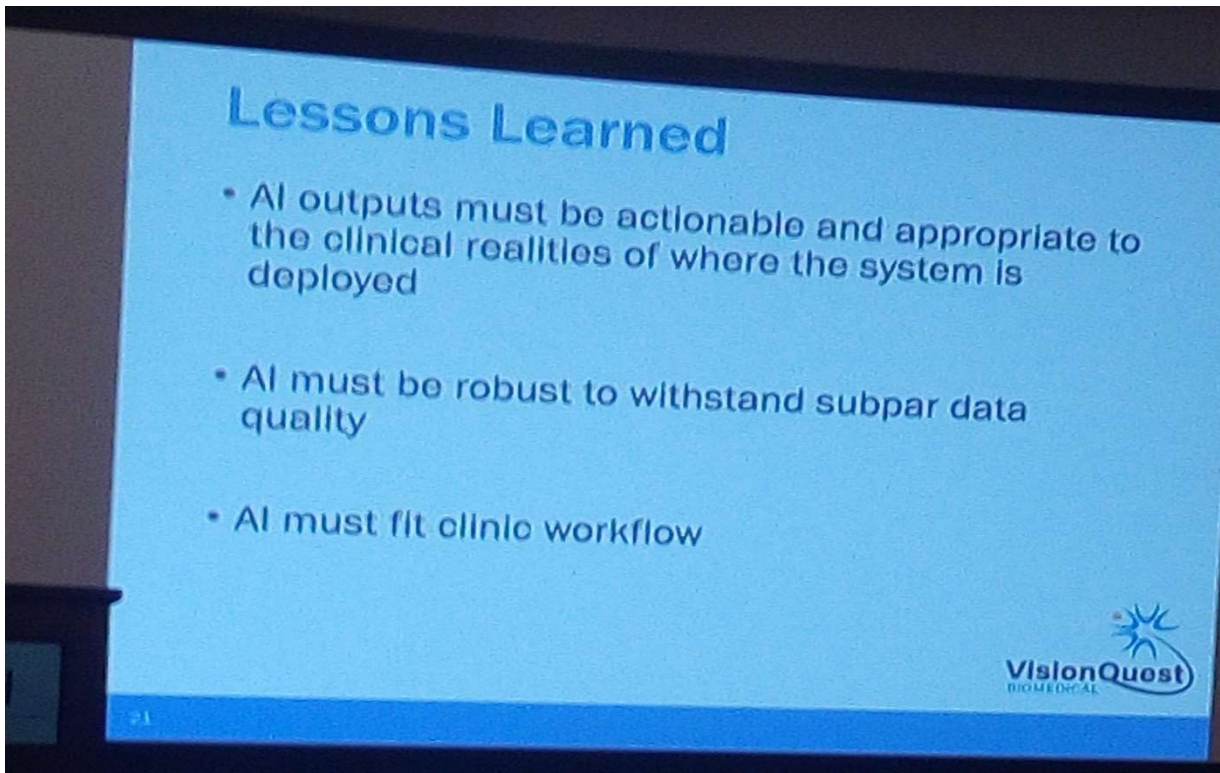
Though the lesson that resonated best, was the first lesson from Dr. Jay Sanders, MD, as the opening speaker who said that **resistance to change is the most powerful human emotion of all.** And that we all should go forward not so much to the road less traveled in the immortal words of Ralph Waldo Emerson, but go and make a path. OBIX needs seek its own path, work within the strength of its eco systems, and build a unique value proposition for the perinatal market.

VENDOR AND SPONSORS OVERVIEWS | SIX

intouch Health – robots and telemedicine

Offered surrogate interfacing robots ~ average systems are priced at $600,000 before maintenance fees.

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Genetic Counseling – insurance reduction

About using genetic counselors to reduce hospital liability and risks. Your DNA data at work whether you want it or not.

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Telehealth technology solutions and providers

About full integration along the work flow and streamlining with technology to improve outcomes. Technology management consulting.

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cloud dx – wearable continuous vital signs monitor

Continuous vitals for EKG using ear plugs from the neck collar – though they won the Award, the device appeared a bit clumsy for everyday use and perhaps a smaller foot print device is better suited.

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