The Future of Healthcare IT: Artificial Intelligence
Healthcare Artificial Intelligence

Understand

• Where the market is today
• What is feasible and in development
• How are these AI technologies deployed
• When are they useful
• Use cases and Functional areas of AI deployment
Market Needs | THE PROBLEM STATEMENTS

Demand Drivers

- **Lack of resources**: Not enough qualified/trained clinical staff to reach populations on a daily basis.

- **Cultural**: Resources are not culturally aware of specific ethnic types/regional differences/age differences.

- **Disparities**: Socio-economic issues relate to different outcomes unnecessarily; most have access to handset technology.

- **Changing Disease Patterns**: Increase in Chronic and Lifestyle Diseases.
DIGITAL INNOVATION IS THE NEW HEALTH FRONTIER
Patient Self Service & Improved Engagement Opportunities are a Global Requirement

Exhibit 1
More than 75% of all patients expect to use digital services in the future.

Exhibit 3
Awareness and process execution are the core drivers of digital-service adoption for patients.


Respondents were asked the following: From your perspective, what needs to happen for you to use certain services online/on your mobile phone more frequently than in the past? Please select the three most important criteria for you.
Overview of Artificial Intelligence

• Machine Learning
  • First type of intelligence where machines can operate within a set of rules
  • Often brittle solutions and limited scope but offer

• Deep Learning
  • Neural Nets and other deep learning systems
  • Very specific and create true rapid analysis

• AGI
  • Next level of Cognitive learning
  • True reasoning in multi-modal pathways – deductive, inductive, abductive
Overview of Artificial Intelligence

• Cloud vs edge
  • Cloud systems aggregate processing capabilities to provide brute force or high speed systems
  • Edge networking or Swarm Intelligence allows for small AI to be placed in standard processors at edge
    • Can run in small footprints
    • Swarming bees that learn from each other and become an intelligent “system”

• Real-time vs retrospective
  • Real-time analysis is utilized when processing requires immediate decision-making
  • Retrospective allows for “exploring” data for unique patterns and matching
Population Health – Colossal Data

• Life Sciences
  • Cancer drug
  • Matches in treatment/genetic outcomes – Phenome, Genome
  • Predictive Research

• Hospital – treatment variability

• Health and Wellness – Engagement in Care (chronic, sponsored, fitness, etc)

• Consumer – Concierge, identify specific treatment and content

• Professional – Knowledge analysis, assisted decisioning
Targeted implementation of AI technologies to collect, analyze and provide insight into large data sets.

The underlying AI forms are already built and are simply repurposing for different data sets that are applicable in Specific Population Health settings – Consumer, Hospital specific, Physician centric, Pharma and Research.

With Population Health, we are addressing specific desired search criteria to identify a target population (or several targets) for intervention, i.e. find me all individuals who have a score of X-Z indicating they may be pre-diabetic.

Utilize tools to look across the data sets and return results.

Use results connected to Customer defined interventions to create targeted populations (all males aged 30-64 who have not seen doctor for annual checkup).
Autonomous Intelligent Agents

Agents are engagement platforms – Geo-location, Natural Language, State awareness

• Consumer
  • Chatbots – simple
  • Concierge engagement platforms
  • Serve as first line for call centers

• Professional
  • Knowledge support
  • Reference
**Patient Engagement:**

Active patient interactions via sensors data and patient feedback:
- Patient Health Monitoring
- Education & Training
- Social Health via Physician and Family Interactions
- Greater Personalization of Care
- Improved Patient Adherence and Outcomes

**Professional Engagement & Decision Support:**

Active engagement assisting healthcare professionals in assessing patients, training and decision-making:
- Medical Risk Analysis
- Education & Training
- Reference System
- Assessments (Problems, Meds and Allergies)
- Root Cause Analysis (Diagnostic, Causal, missed diagnosis)
- Reducing Practice Variation
Network Intelligence

• In-Network AI Agents
  • Smart networks
    • Intelligent systems prevent intrusion and detect anomalies
    • AI generated Encryption
  • Scheduling – AI agents schedule for resources, services, utilizations
  • Bioanalysis – utilized to detect bio information with sensors

• FOG intelligence
  • Allows for processing at edge
  • Subsystems become aware of each other and share information locally
  • Create agents in infrastructure
EXAMPLE 3 – ENHANCED PATIENT ACTIVATION

- Communication transactions treated as an encounter
- Format agnostic file viewer with diagnostic quality DICOM support
- Support file attachments inside a chat session
- Access communications options such as email, sms, voice, video and walkie talkie
- Support for real-time medical device feeds
Operational Use

• Device
  • Small AI in unit allows for intelligent sensors
  • Synthesized platforms for alarm reduction
• Disease outbreak early warning
• Social networking
  • Understand what is going on in market
  • Early warning
• Agent based Facilities Management
• Smart tracking
A CARE CONTINUUM MODEL

INTRODUCTION

POPLATION HEALTH WEB SERVICES

HEALTH AND SAFETY AWARENESS
Health vital alerts, diet and nutrition, medication management, personal safety monitoring, telehealth

CARE COORDINATION
Care planning, care professional engagement, records and benefits management, recovery support

DAILY ESSENTIAL ACTIVITIES
Meals, home and personal care, home repair, delivery, transportation services

CAREGIVER QUALITY OF LIFE
Respite and backup care, social support, health and wellness, financial/job

TRANSITION SUPPORT
Home retrofit services, long-term care insurance planning, long-term care provider referral, legal assistance, hospice/funeral planning

SOCIAL WELL-BEING
Digital inclusion, life enrichment and empowerment, community networking, life companions

AARP
Financial

• Fraud and abuse
• Predictive stock use and prevention of out-of-date products
• Contract analysis
• Advanced IDN modeling
Financial

• Risk Analysis
  • Who is eligible
  • What should be done
  • Physician outcomes
  • Procedural outcomes
  • HAI management

• Readmission prevention
• Care Transition Management
• MACRA/MIPS maximization
Thank You

Question?
Use Case Scenarios
Use Case Scenarios

- **AIA Consumer**
  - Interactive engagement
  - Device tracking and monitoring
  - Education / Awareness
  - Geo-located servicing

- **AIA - Professional**
  - Assistant for providing real-time decision-making
  - Risk Analysis
  - Education
  - Engagement with medical risk analysis

- **Care Management**
  - Risk Analysis / Stratification
  - Tracking to Protocol
  - Readmission prevention
  - Care Transition management

- **Population Health**
  - Advanced learning and detection
  - Personalized population health management
  - Health trending and disease monitoring
  - Targeted / appropriate engagement

- **Research Health (Pharma and Genetic)**
  - Advanced learning and detection
  - Complex computational analysis
  - Deep matching and relevance
  - Targeted / appropriate treatment

- **Media**
  - Tunable content for specific disease state
  - Content awareness and direction
  - Geo-location capability (on handset) – steer to resource
  - Revenue generation

- **Social health interaction**
  - Social media analysis and agent determination
  - Directed Social engagement utilizing agent tools
  - Early detection – Social comments, searches, statements
  - AIA driven social agents

- **Visualization**
  - Image Management
  - Advanced Image Analysis
  - Disparities reduction

- **Natural Language Understanding**
  - In Hospital tracking of procedures
  - Eliminate Scribes
  - Better structured notes and content
  - Analysis and recommendation engines
Use Case Scenarios

• Security
  • Advanced HIPAA and EU Directives capability
  • Document level security
  • Multi-partner capability

• Revenue Cycle Management
  • Improved predictive management of revenue
  • Predictive analysis of payments/non-pay insurers
  • Follow-up engagement with Insured/guarantor to collect
  • AIA driven Patient Portal for authorizations, signatures, and copayments

• Supply Chain Optimization
  • Appropriate predictive supplies
  • Detect and reduce variances and disparities
  • Reduce stock expiration

• MACRA MIPS Optimization
  • Maximize CMS payments under new models
  • Reduce variability, disparity and workflow
  • Improve patient linkages
  • Optimize Chronic care treatments and engagement

• Data Analytics
  • Automatic Indexing & Analysis
  • Content awareness and direction
  • Geo-location capability (on handset) — steer to resource
  • Revenue generation
This webinar will cover how Artificial Intelligence (AI) is changing how we deliver healthcare today. The AI will develop “Agents” that will become a digital workforce. The AI can cover large data problems that cannot easily be digested by humans to detect specific treatments, best outcomes, map genetic based treatments, eliminate error and personalize medicine. AI agents are also beginning to directly interact with individuals which will lead to new engagement paradigms, daily interactions, and collection of data elements not available with our current delivery systems.

AI will also begin interacting and providing smarter in-hospital systems through smart supply chain, reducing false alarms, and providing smart support for HAI management.