Fundamentals of AI for Health

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We are Avegen

We improve quality of life of Individuals with major health needs by ensuring integrated 'out-of-hospital', proactive specialist care.

150,000+
Individuals have benefited from our work.

1000+
Healthcare providers in U.K & India are supported by us.
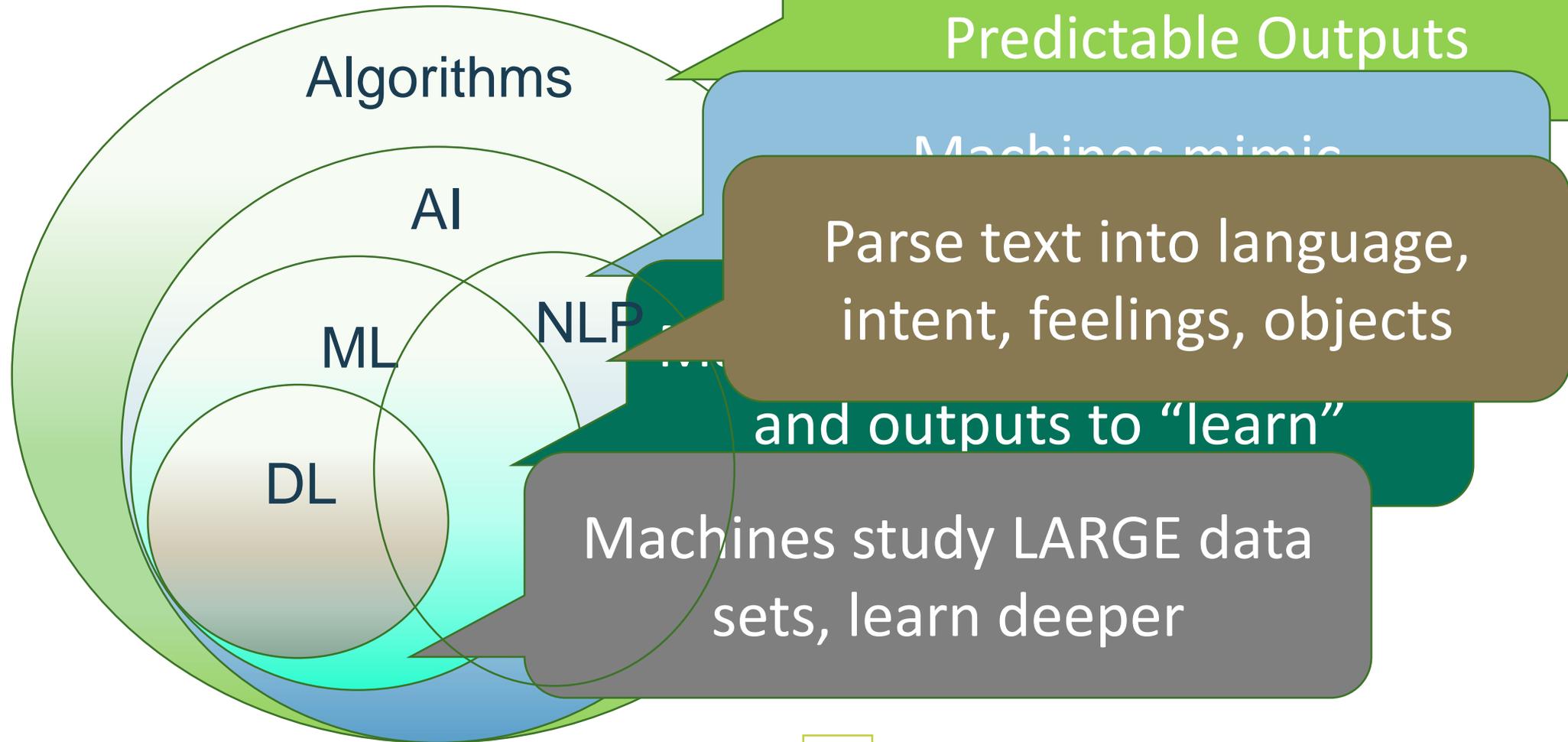
40+
Strong, global, cross-disciplinary team.

In plain English

Artificial Intelligence is...

...any technique that enables machines to mimic human decision making behavior

AI, ML, DL, NLP

Algorithms

AI

ML

NLP

DL

Predictable inputs, Predictable Outputs

Machines mimic

Parse text into language, intent, feelings, objects

and outputs to "learn"

Machines study LARGE data sets, learn deeper

AI - what is it good at?

The biggest challenge in AI today is NOT programming, but to imagine what you might ***do*** with these awesome tools!

- Pattern recognition (e.g. images, voice, numbers)

- Prediction of time series data (e.g. Energy requirements, stock prices, currency)

- Natural Language Processing (e.g. sentiment analysis, extract language semantics)

AI in Healthcare – Practical Challenges

- Lack of cross-domain expertise between AI and medical science

- Access to large training data-sets while protecting patient privacy

- Healthcare is hyperlocal

- Legacy IT systems or lack of digital strategy

- Integration into existing clinical workflow

- Algorithm/Model Validation is hard and time consuming

- Limited certification guidelines or regulatory guidance

- Accuracy vs Transparency of results

- Liability – who is responsible when things go wrong?

Case Study – AI for behavioral change and compliance

Sexual Health & HIV

Segment: At-risk and stable HIV Patients

Primary Outcome:

1. Compliance to best practices
2. Reduction in Lost to follow-up
3. Improve patient engagement with minimal cost

Partner: Mumbai District AIDS Control Society (MDACS)

Results: Expected in Jan 2020

Estimated Lives Touched:

- 3000 patients
- 50 Healthcare professionals
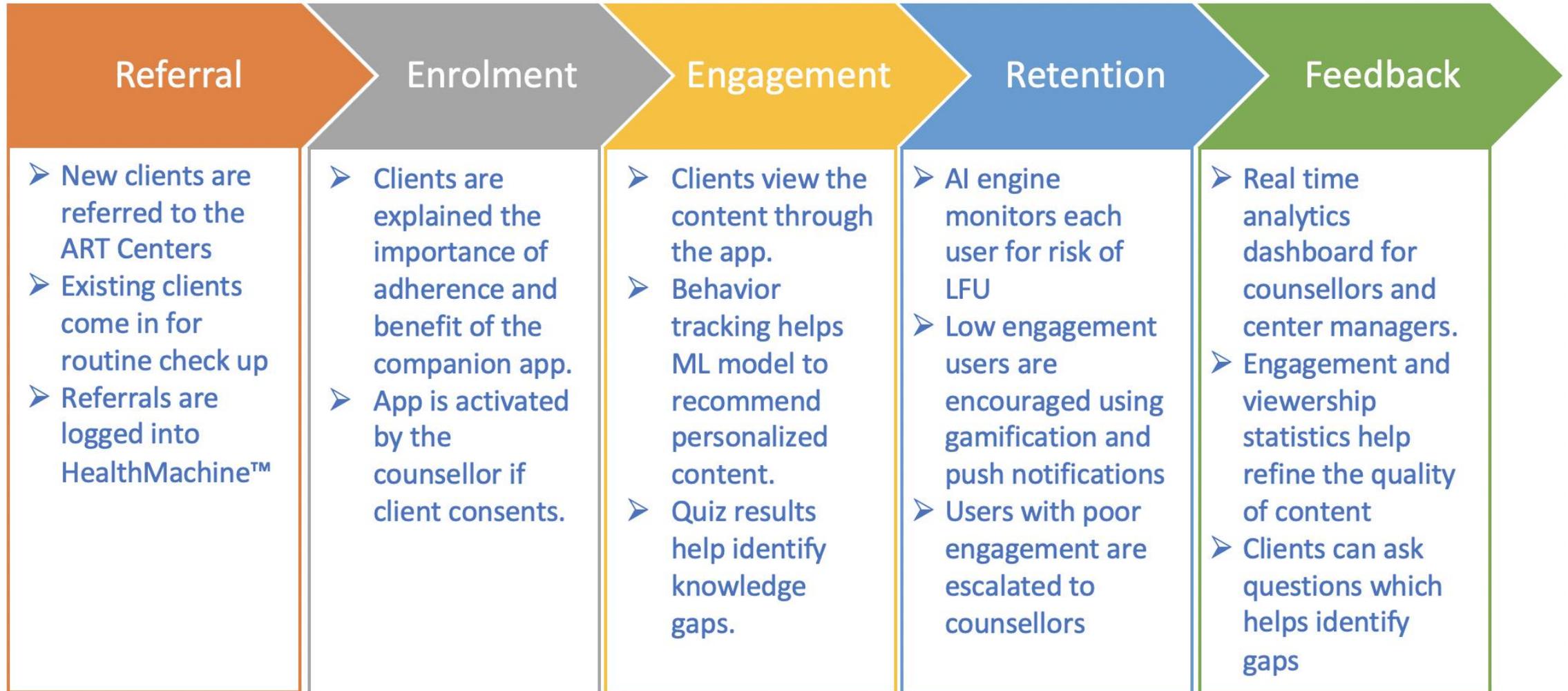
Case Study – Problem and Intervention

Problem Statement:

After being diagnosed, clients either do not start the treatment at all or drop out along the pathway. In other words they are "Lost to Follow Up" (LFU).

Digital Intervention:

1. A first of its kind mobile app for PLHIVs, with original, Hindi videos, infographics and quizzes
2. Content designed in conjunction with experienced counsellors and experts at MDACS
3. Counsellors have been trained to install this app on the phones of the patients
4. AI will be used for:
   - ✓ Targeting relevant content to the patient as per classification
   - ✓ Improving engagement with the client
   - ✓ Gamification via quizzes
   - ✓ Highlighting at-risk patients to the center before they are LFU

Case Study – Care Pathway

Referral	Enrolment	Engagement	Retention	Feedback
➤ New clients are referred to the ART Centers ➤ Existing clients come in for routine check up ➤ Referrals are logged into HealthMachine™	➤ Clients are explained the importance of adherence and benefit of the companion app. ➤ App is activated by the counsellor if client consents.	➤ Clients view the content through the app. ➤ Behavior tracking helps ML model to recommend personalized content. ➤ Quiz results help identify knowledge gaps.	➤ AI engine monitors each user for risk of LFU ➤ Low engagement users are encouraged using gamification and push notifications ➤ Users with poor engagement are escalated to counsellors	➤ Real time analytics dashboard for counsellors and center managers. ➤ Engagement and viewership statistics help refine the quality of content ➤ Clients can ask questions which helps identify gaps

Case Study – Lessons learnt

Listen to the customer

Technology is important, but first identify a problem that really matters to the Healthcare Professionals, or Patients, or both!

Make it easy for the front-line health worker

Their primary job is to care for the patient, not operate your system

Test UX in the field

Understand factors like "real" devices, connectivity in the wild, attention span of the user. Test in these conditions.

Build with the model in mind

Build the system to capture as much annotated data as possible on day 1 so your model becomes shaper faster

THANK YOU

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