**PROBLEM**

Health of people is worsening because the Healthcare system fails in delivering its mission.

**Case for US Healthcare system**

- Out of 10 patients facing a medical issue, 7 decide to avoid the Healthcare system. This causes a worsening of the long-term health of the patients, that get exposed to serious consequence.
- Why patients do not visit doctors?
  - Increasing price: On average a primary care visit costs $1605 for uninsured patients and $50 for insured patients across.
  - Limited access to doctors: On average 5 days to get a visit, due to limited number of doctors (1 doc per 2k pat., in rural areas 4k pat.)
  - Increasing medical errors: On average 1 over 10 diagnoses is wrong, causing annually 80k deaths and 80k long term injuries

The reason underlying such issues is that the system is delivering healthcare through traditional tools, like human doctors, live visits, offline pharmacies, insurance companies.
Relying on such tools is not effective anymore!

**SOLUTION**

Personal Doctor is a technology that brings a doctor in your pocket, leveraging on big data, mobile devices and AI with the objective to help people live healthier, longer and happier lives.

<table>
<thead>
<tr>
<th>Building block</th>
<th>Description</th>
<th>Output</th>
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</thead>
<tbody>
<tr>
<td><strong>Medical knowledge</strong></td>
<td>&quot;Fictitious&quot; records of 1M patients Generated from probability distributions of gender, age and symptoms given a disease. Data source: PubMed and symptom checkers</td>
<td>Questions on 324 symptoms</td>
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<tr>
<td><strong>Personal Doctor</strong></td>
<td>Deep reinforcement learning that asks question to the patient on most likely symptoms and predicts the disease, given as input the main symptom and the gender/age</td>
<td>Prediction on 226 diseases</td>
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<tr>
<td><strong>Symptoms checker</strong></td>
<td>Recurrent neural network that predicts most likely symptoms suffered by the patient given as input the main symptom and the gender/age information</td>
<td>Symptoms map</td>
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<tr>
<td><strong>Disease predictor</strong></td>
<td>Deep neural network that predicts most likely disease of the patient given as input the symptoms and the most important general info, i.e. gender and age</td>
<td>70% accuracy in predicting diseases</td>
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</tbody>
</table>

**RESULT**

Reduce cost of primary care
Increase access to medical opinion
Improve quality of healthcare

**How the Personal Doctor works**

- **Facing a medical issue**
  Kate is facing a strong nasal congestion, she cannot reach her doctor and is worried for her health

- **Consult Personal Doctor**
  Kate can get access to her Personal Doctor whenever and whenever thanks to her mobile device

- **Type general info and symptom**
  Kate types in her gender and age (if 1st time user) and describes her major symptom to Personal Doctor

- **Personal Visits**
  The Personal Doctor asks Kate questions on other symptoms (e.g. coryza, cough) and collects answers

- **Diagnosis & medical opinion**
  Personal Doctor provides Kate a diagnosis for the Acute Bronchitis and suggests the best treatment