01 Problem Statistics: Need for Drug Safety

02 Use Cases: (a) Drug Misuse Management (b) Opioid Use Disorder

03 Best Solution: PillSafe Saving Lives, A Precise Mobile Application for Drug Safety

04 Benefit: Better Health and Saving Lives for Aging Baby Boomers, Veteran Health, Community Health

05 Featured Innovation: Google Cloud with Auto Machine Learning Platform

06 Alignment with Precise Software Solution Core Capabilities

07 Takeaways: Strategic Considerations for Go to Market

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Problem Statistics: Need for Drug Safety Misuse of Prescription Drugs

- **187M**: Americans use prescription drugs
  - Source: Network for Excellence in Health Innovation (NEIH)

- **110M**: Prescriptions per year that are never picked up
  - Source: CVS Pharmacies based on 2008 data

- **50%**: Don't take medicines as prescribed
  - Source: NEIH

- **125K**: Americans die every year as a result
  - Source: Research cited by the then-US surgeon general in 2012
Patients prescribed opioids for chronic pain misuse them.

Develop an opioid use disorder.

Misuse prescription opioids transition to heroin.

People who use heroin first misused prescription opioids.

Opioid overdoses increased from July 2016 through September 2017 in 52 areas in 45 states.

The Midwestern region saw opioid overdoses increase from July 2016 through September 2017.

Opioid overdoses in large cities increase in 16 states.

Source: https://www.drugabuse.gov/drugs-abuse/opioids/opioid-overdose-crisis
An adverse drug event (ADE) is an injury resulting from medical intervention related to a drug. This includes medication errors, adverse drug reactions, allergic reactions, and overdoses. The good news is that large majority of ADEs are preventable. Reducing ADEs is expected to result in safer and higher quality health care services, reduced health care costs, more informed and engaged consumers, and improved health outcomes.*

*https://health.gov/hcq/ade.asp
Opioid Use Disorder

Opioid use is habit-forming, especially when opioids are not taken as prescribed. Opioid addiction can be described using three basic components:

- Overwhelming psychological desire to use opioids
- Increased tolerance to opioids
- Withdrawal symptoms when opioids are unavailable

Opioid Crisis

Identifies opioids and offers patients preventative protection through interactive advice on best practices when taking opioid-based medications, and deduces possible addiction in patients to assist in identification and treatment.

Precise Software is doing just that. Correctly identifying a pill based on its physical appearance is crucial for a patient to address medication safety concerns. Color, shape, and imprint uniquely identify a pill, including its name, dosage, and black box warning. Using Google AutoML Vision technology, Precise developed an advanced solution to recognize a pill from pictures taken on a mobile phone. This led us to develop PillSafe, a mobile app that leverages this ML technology solution to promote awareness of pills a patient is taking. The goal of PillSafe is to improve healthcare by streamlining the factors that contribute to public health, wellness, and awareness.

*https://health.gov/hcq/ade.asp
PillSafe Drug Safety for Better Health, Better Live

**Opioid Crisis**
Identifies opioids and offers patients preventative protection through interactive advice on best practices when taking opioid-based medications, and deduces possible addiction in patients to assist in identification and treatment.

**Adverse Event Reporting**
Identifies opioids and offers patients preventative protection through interactive advice on best practices when taking opioid-based medications, and deduces possible addiction in patients to assist in identification and treatment.

**Adverse Event Alert**
Initiates AE alerts by analysing user inputs and prevents escalation of incidents by enabling immediate rescue response.

**Dosage Alert**
Checks the dosage best practice and prevents human error or mistakes by the prescriber.

**Drug Recall Alert**
Alerts all signed-in prescription drug users and medical practitioners to stop newly restricted or banned drugs from use or distribution.

**Medication Management**
PillSafe provides feature to allow the patient to manager their daily medication from different aspects, such as correct dosage, frequency and possible side effect reference; schedule management; automatic notification and recording the experience of taking the medication for further directions.

**Drug Interaction Alert**
Flags a possible adverse effect of a new drug if taken in combination with another drug already being used.

**Clinical Trial Information**
Harnesses big data analytics to provide clinical trial information across the board, in an effort to reduce medical turn-around time and costs.

**Leveraging Social Media**
Public users will be able to use in-app features to interact with PillSafe communities via social media, in order to share personal experiences with other users of the same prescription drug.

**Alerts all signed-in prescription drug users and medical practitioners to stop newly restricted or banned drugs from use or distribution.**
Google Cloud AutoML for Better Health, Saving Lives

AutoML Vision BETA
Start with as little as a few dozen photographic samples, and Cloud AutoML will do the rest.

AutoML Natural Language BETA
Automatically predicts text categories through either single or multi-label classification.

AutoML Translation BETA
Upload translated language pairs to train your own custom model.

We leverage Google Platform products to enable our developers to train our models using Google’s high-tech transfer learning and Neural Architecture Search technology. We leverage machine learning, image recognition, sentiment analysis, and predictive analytics within the PillSafe app.
Training with Google AutoML Vision Platform for Drug Safety

**Step 1: Prepare images**

**Step 2: Train model**

**Step 2: Predict**
Innovation Alignment In Every Solution for Better Health

**IT Modernization and Digitalization**
PillSafe is an AI-powered cloud-based platform. It incorporates the most advanced technologies in machine learning, neural networks and search based algorithms to give stakeholders very personalized and effective solutions to medical care.

**Data, Accountability and Transparency**
Our system incorporates advanced data filtering and authorization capabilities to enable accountable data mining and enable effective decision making for healthcare.

**Improving Customer Experience**
Our intended features solve many pains that patients, medical practitioners and the regulatory bodies have had in the past in the field of medical care. But the most important aspect will be that of empowering drug users to know the impact of their actions on their health.

**Sharing Quality Services**
It is the desire of every person to access the best medical attention possible. Through our analysis of cause and effect in medical care, we will be able to provide people with information about which medical services are serving similar cases best.

**Improving Transfer of Federally-Funded Technologies**
The US Government has funded a lot of research into technologies that could benefit its citizens, especially in the medical sector. We will blend these technologies into our solution, even as we strive to lead the way in showing other businesses how they can leverage these technologies for other use cases for better products and services in all sectors.
ABOUT PRECISE

Precise Software Solutions, Inc. (Precise) is a nimble and fast-growing SBA 8(a) certified small business focusing on strategy and IT consulting services to public sector customers. We are proud of our strong reputation for overcoming obstacles and delivering innovative, quality work with measurable results. For detail information, please visit us at www.precise-soft.com
Thank You