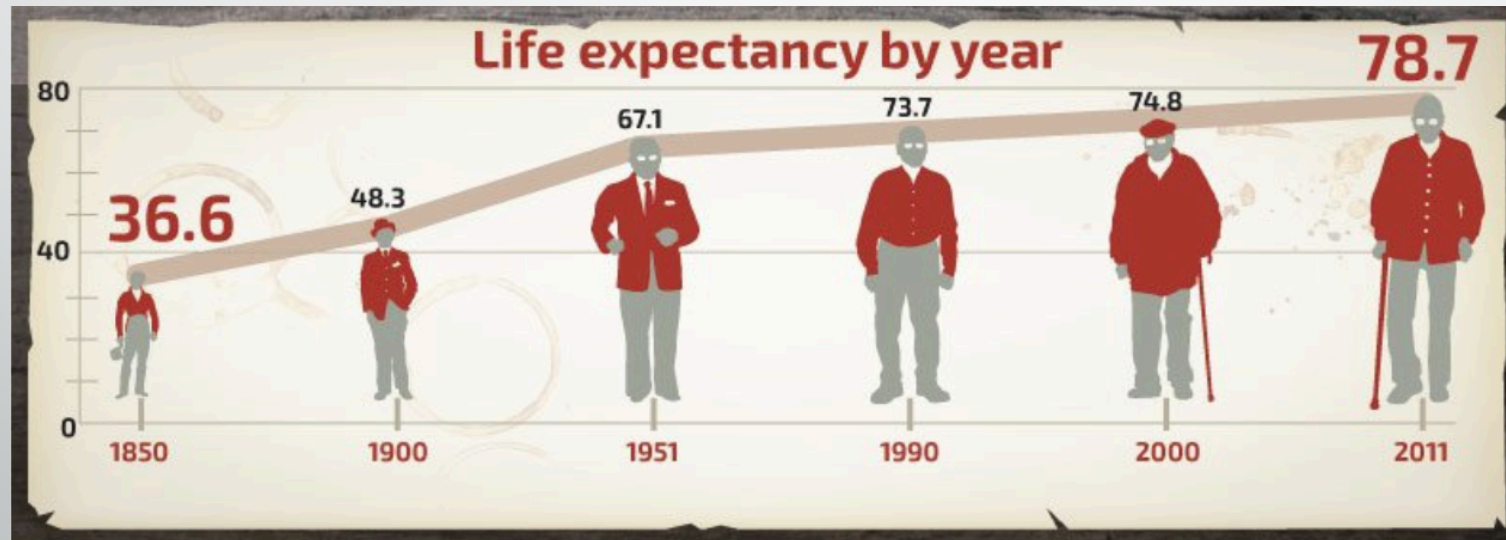


MACHINE LEARNING TO SUMMON EFFECTIVE MEDICATION PRACTICE

Rajath Akshay Vanikul
29498724

Medicine

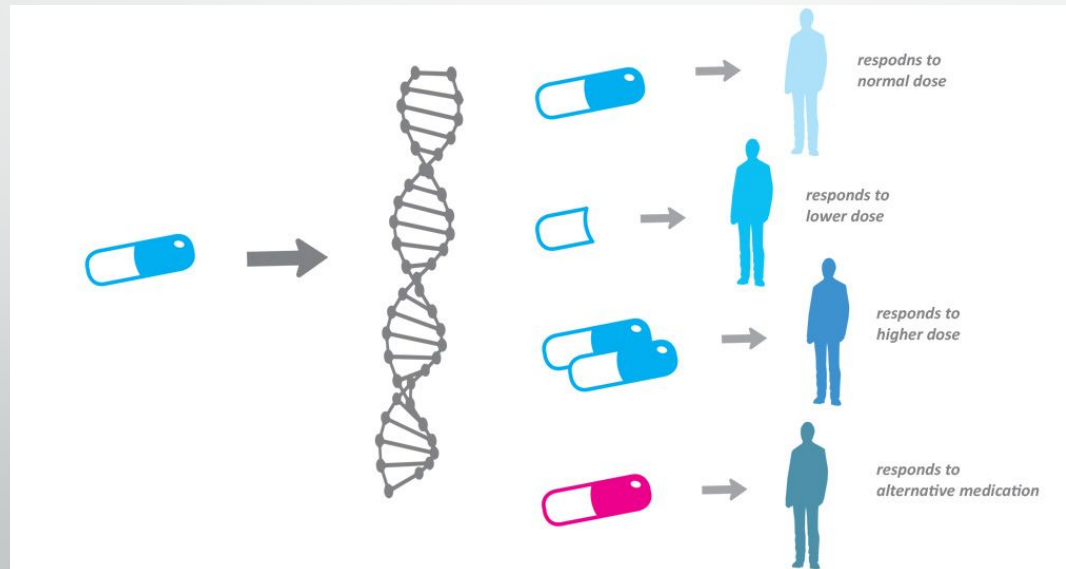
- Medication is the art of curing or preventing illness
- Modern medicine has transformed the approach of treating illness resulting a surge in average life expectancy



Modern medicine!!

Does it still has a room for improvements?

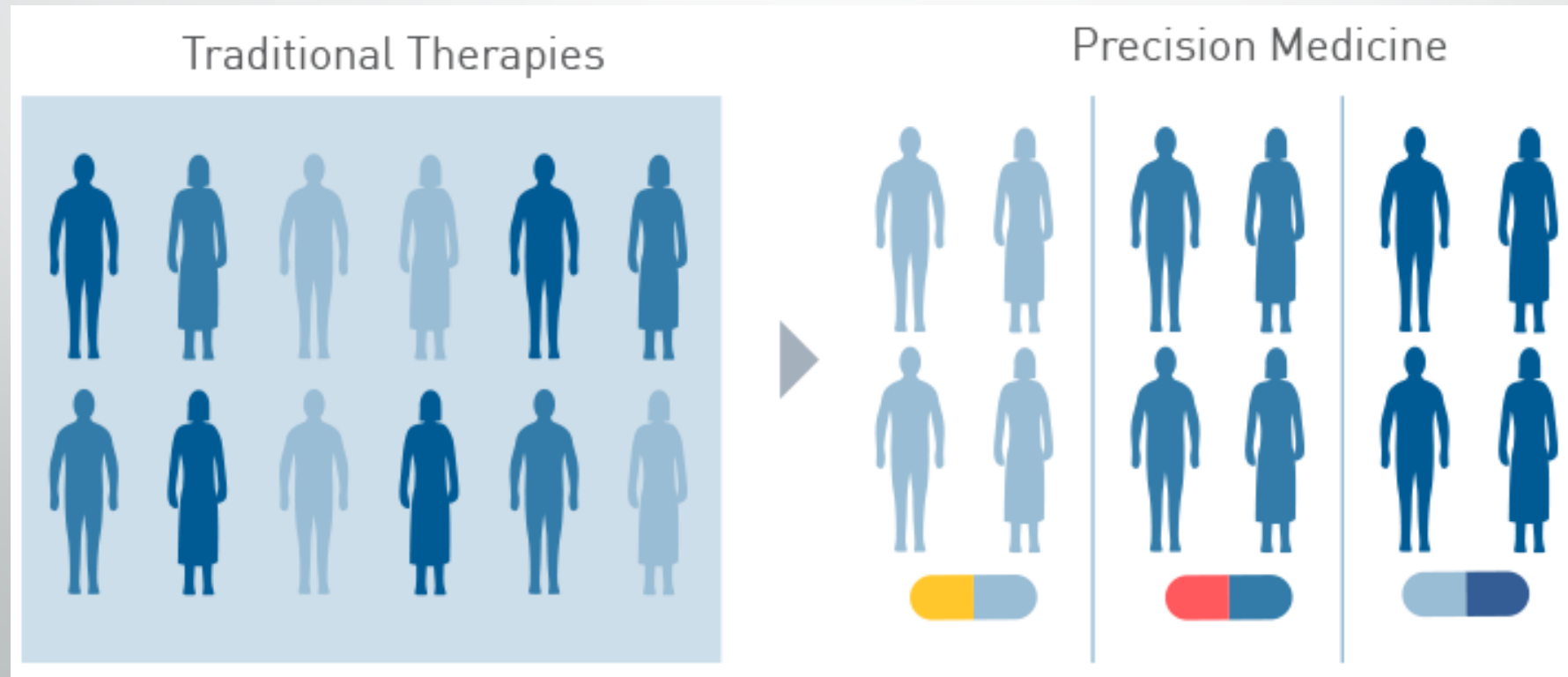
- Diagnosing errors leading to poor prescription and treatment
- Medication errors are equally recurrent in general practice
- Most medicines are prepared and targeted towards an average individual
- Every drug uniquely interacts with each human body, so what works well for one individual may not help the another



Creates an unsafe treating environment.

Precision Medicine

- Tailoring of medicine according to the individual characteristics of each patient
- Helps in better understanding of the underlying mechanisms of various diseases
- Ability to predict which treatments will treat best for specific patients and which doesn't

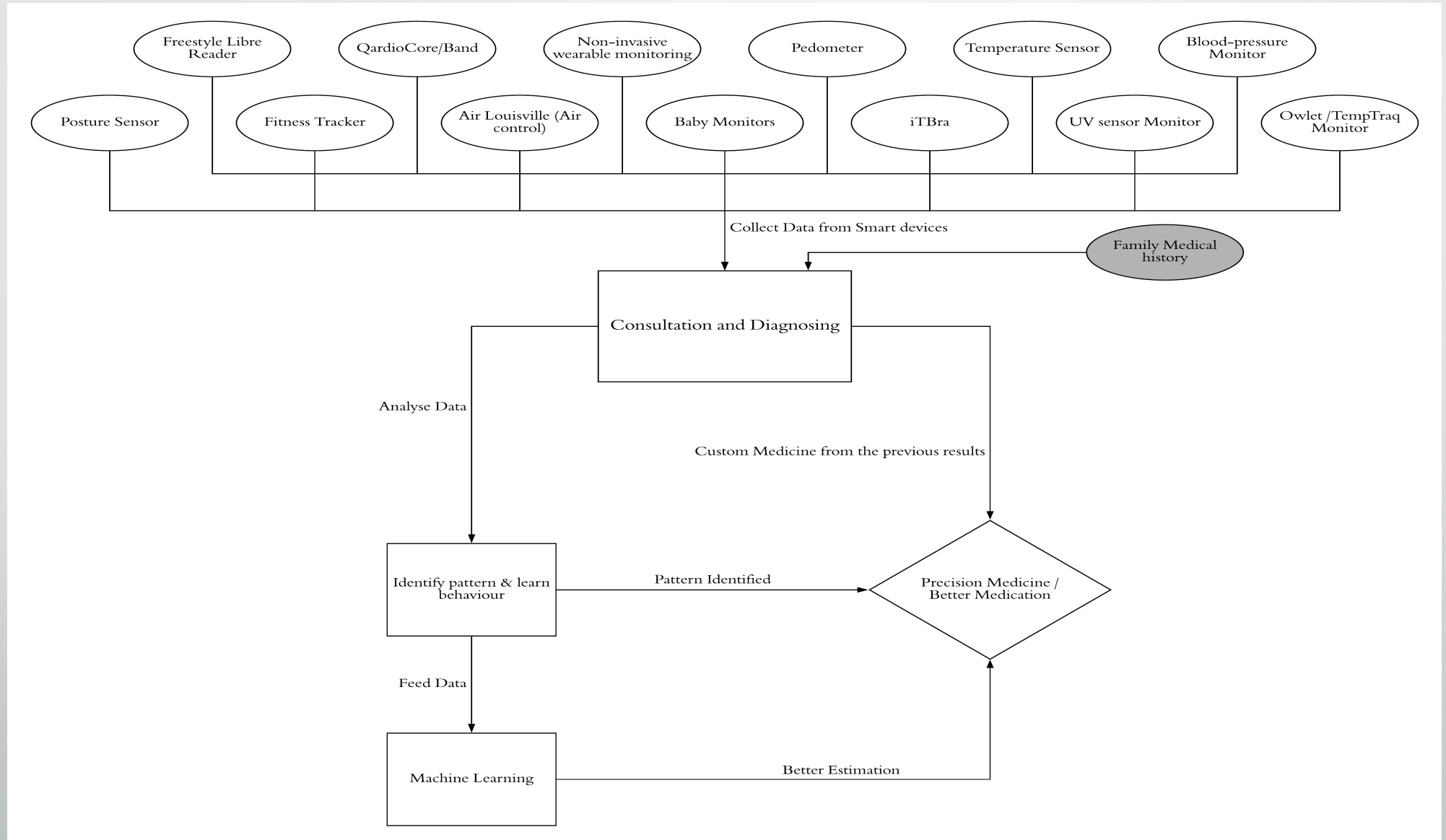


PROJECT DEFINITION

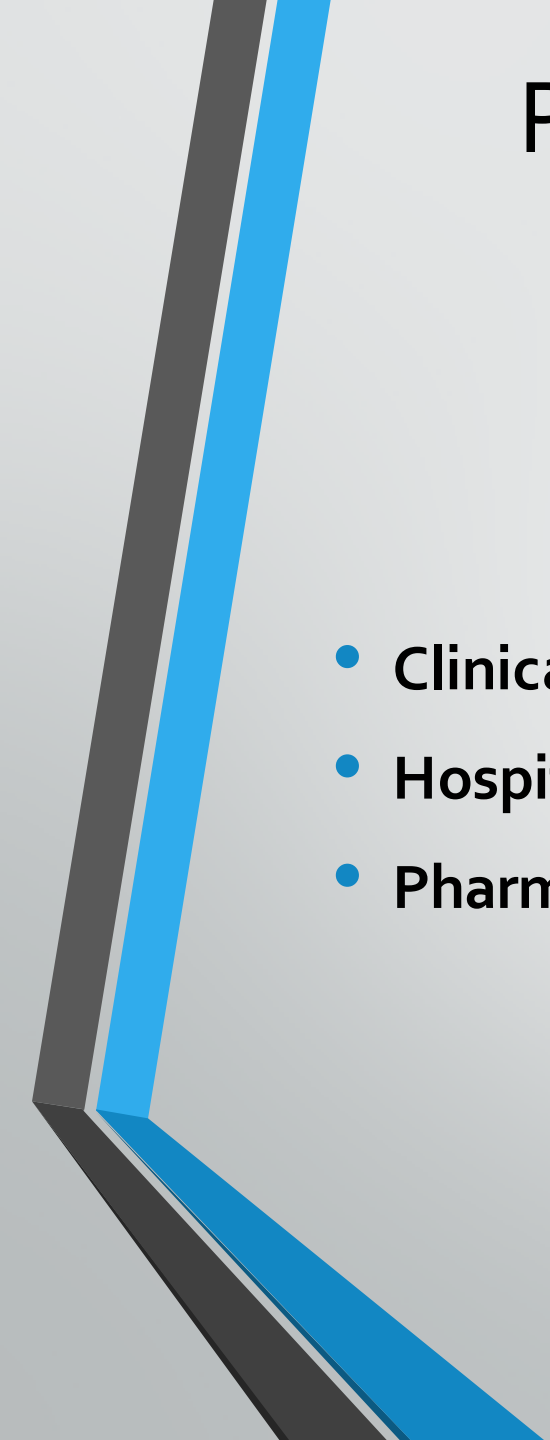
- The model promises to design an interactive platform to harvest personalized data from smart monitoring devices
- Analyze individual body reactions to the medicines at each stage of the medication and find patterns to make better informed decisions
- Build a machine learning algorithm that detects the patterns in the electronic medical records and suggests the possible outcome of the situation to help develop precision medicine



Business Model



Influence diagram of the business proposal



Proposed project has benefits over the following business areas:

- **Clinical Research and Development** – accelerating clinical trial procedures
- **Hospitals** – effective diagnosing leading to successful treatments
- **Pharmaceutical Industry** – better medicine, tailored medicine production

Characterizing Data

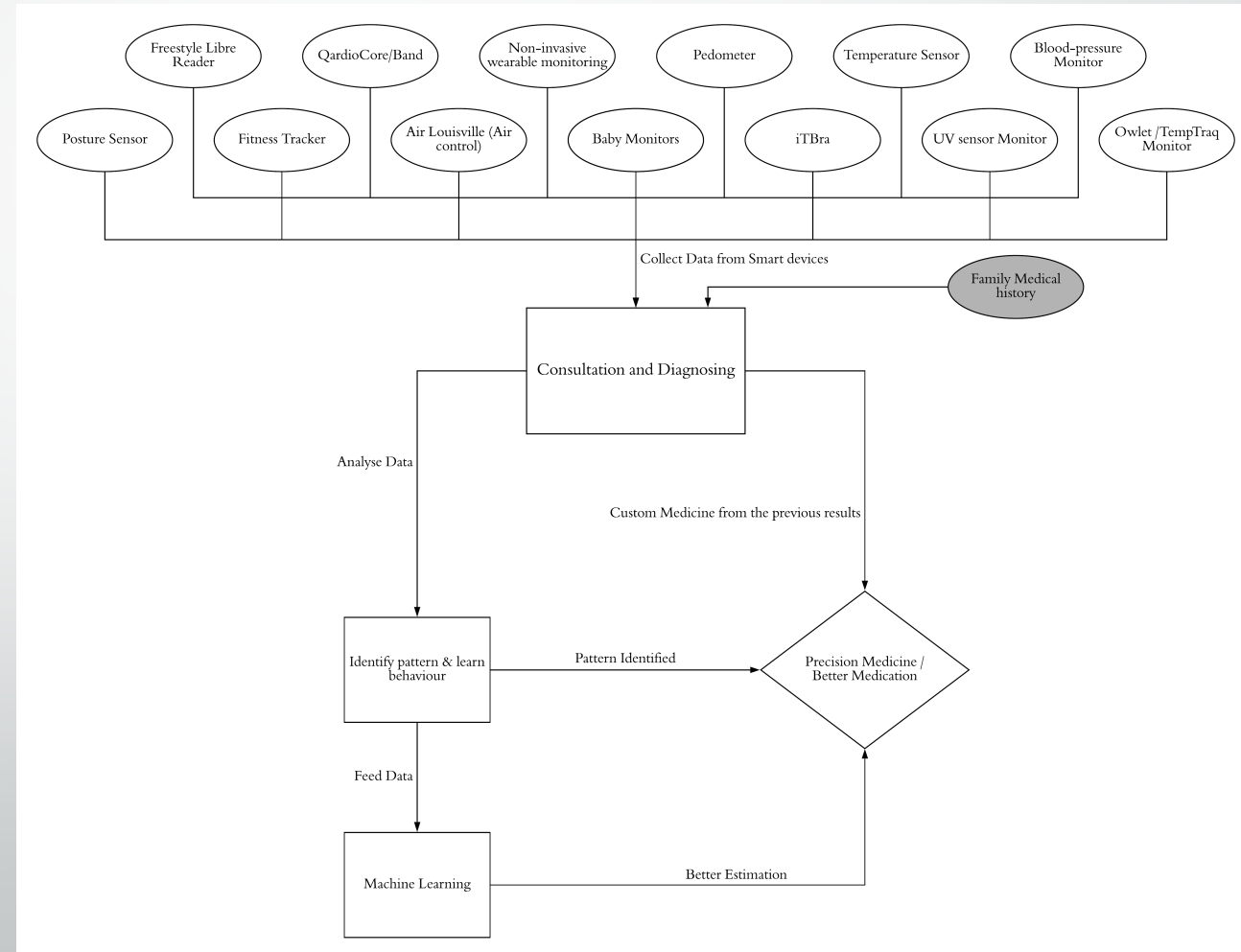
- **Volume** - estimated to be 0.088 zettabytes (8.8×10^{10} GB) of data by 2020
- **Velocity** - expected to generate up to 0.5 million GB of data per day
- **Variety** - various health monitoring devices to gather data
- **Variability** - device measures different values with each given moment
- **Veracity** - employs data governance and information governance to ensure their data is trustworthy
- **Visualization** - interactive dashboards
- **Value** – precision medicine and clinical research

Data Sources

- **Freestyle libre reader:** Device used to track glucose levels in the body.
- **QardioCore/KardiaBand:** Wearable device around the chest that tracks ECG and EKG of an individual.
- **Pedometer:** Non-invasive wearable device on the wrist/ankle used to track pulse, fitness activities and sleep cycles.
- **Tempe Sensor:** A device that transmits ambient temperature data wirelessly to a designated machine.
- **Blood Pressure Monitor:** Wrist wearable device that can display BP of an individual and transmit the data to the synchronised computer.
- **Posture Sensor:** A device that tracks postures of spine, leg, arms and neck. This can help us address the issues specific to an individual's lifestyle.
- **Air Louisville:** This monitors the quality of air around the individual.
- **iTBra:** Keeps a track of unusual developments that can lead to breast cancer.
- **Baby Monitor:** Device that tracks metabolic and sleep cycles in babies.

Data Analysis

- Data Wrangling
- Unsupervised machine learning
- Supervised machine learning
- Predictive analytics
- Causal analysis





Thank You