

A circular icon with three concentric circles and two curved arrows forming a loop, suggesting a cycle or process.

# Smarter Phone



# 1. Introduction

# TEAM NFET

## Participants:

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## 2. Business Challenges

# BUSINESS CHALLENGES

Issues	Our Solution
<ul style="list-style-type: none"><li>• Less relevance of ads</li><li>• Extra hardware to detect person's activity</li><li>• No generic API/SDK for the above</li></ul>	<ul style="list-style-type: none"><li>• Smart health assistant</li><li>• Improvements of ads by categorizing ads for different physical activities</li><li>• API/SDK for other developers</li><li>• Improvement of recommendations based on user's activity</li></ul>

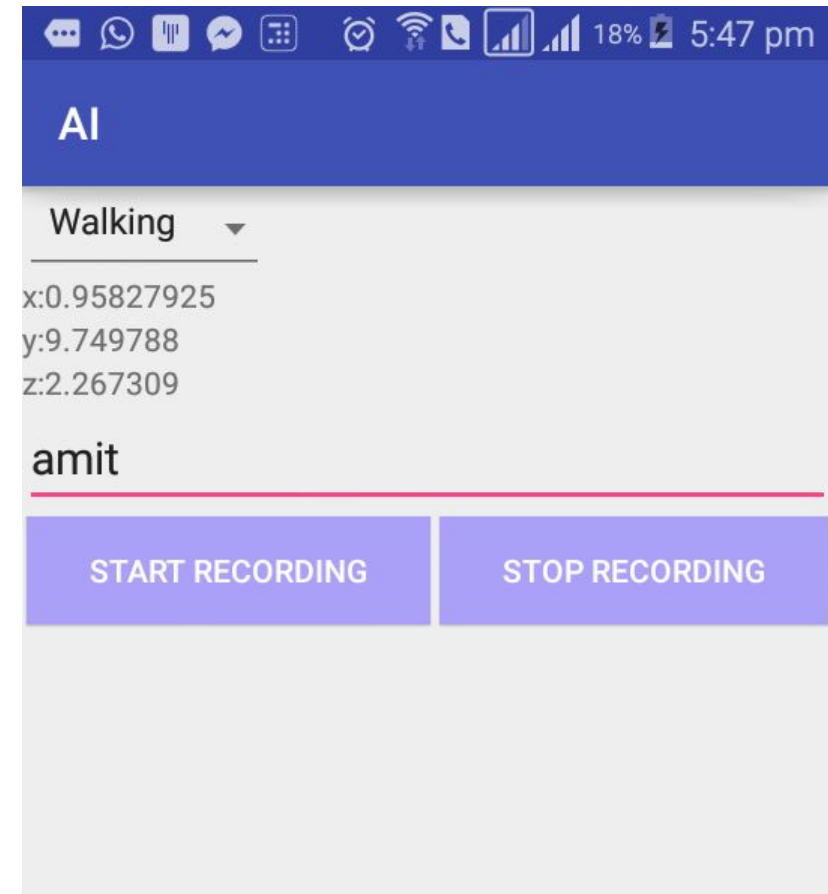
### 3. Approach/ Technology

# HOW DID WE DO IT

- Step 1 - Data generation
- Step 2 - Training our activity prediction model
- Step 3 - Using prediction model on smartphones (offline)

# STEP 1 - DATA GENERATION

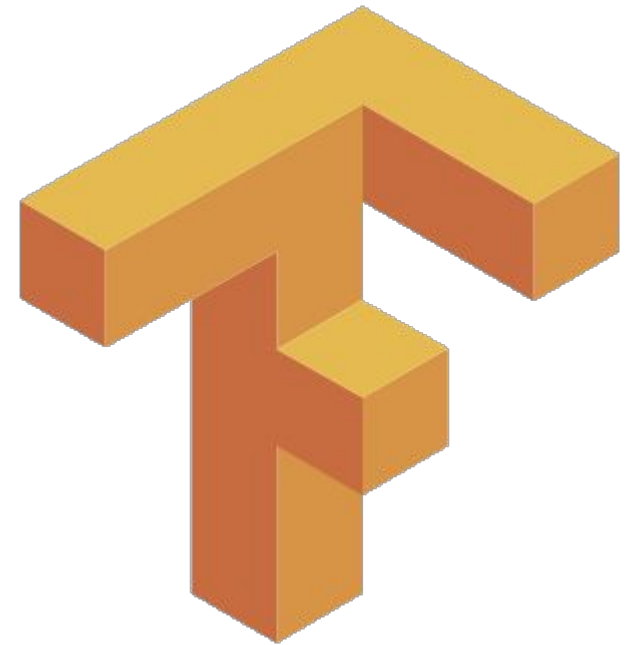
- Android application developed to generate data
- Collected data of each activity for 10-15 mins from seven android phones.





## STEP 2 – TRAINING OUR PREDICTION MODEL

- Use of generated data to train our prediction model
  - Using Convolutional Neural Network (Machine Learning concept)
  - Combined 100 samples (at 50 Hz) of accelerometer data for training
  - Performed 1D Convolutional with 60x3 and 20x1 weight matrix, followed by Max Pooling
- Achieved accuracy of more than 90%



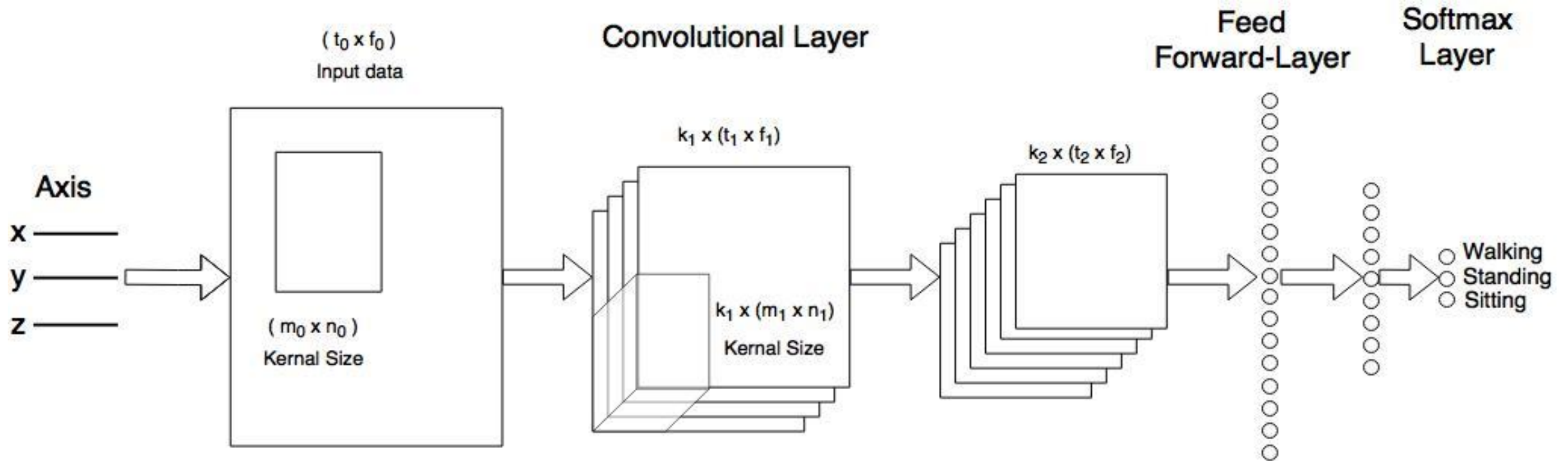
## STEP 3 - USING PREDICTION MODEL ON SMARTPHONE

- Import trained model to phone to predict the activity offline
  - Used NDK\* provided by android to link TensorFlow to JAVA
  - Predict activity for 100 readings
  - Taking 100 predictions (10/minute) and finding the most occurred activity
  - Build Notifications by fetching the data from local database

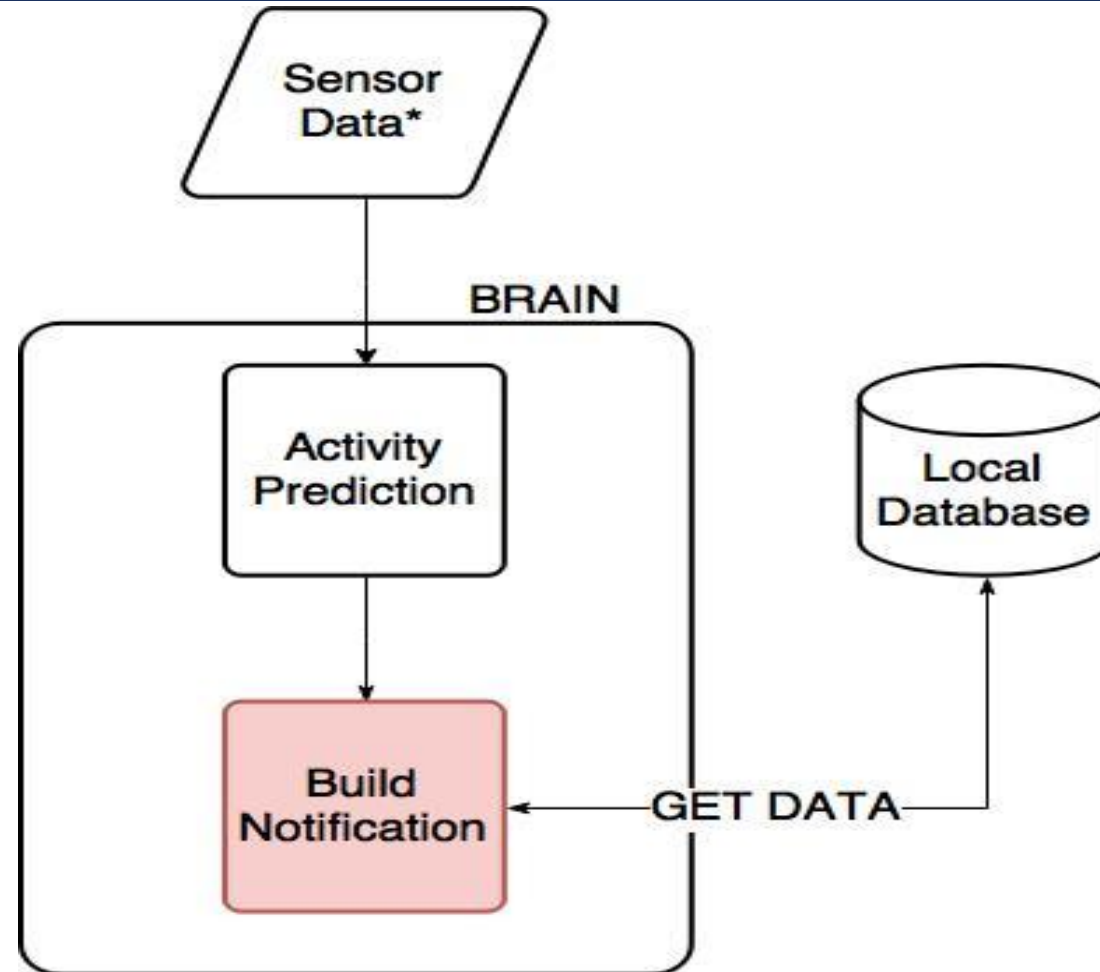
21. Standing  
22. Standing  
23. Standing  
24. Sitting  
25. Standing  
26. Standing

\*NDK - Native Development Kit

# TECHNICAL ARCHITECTURE



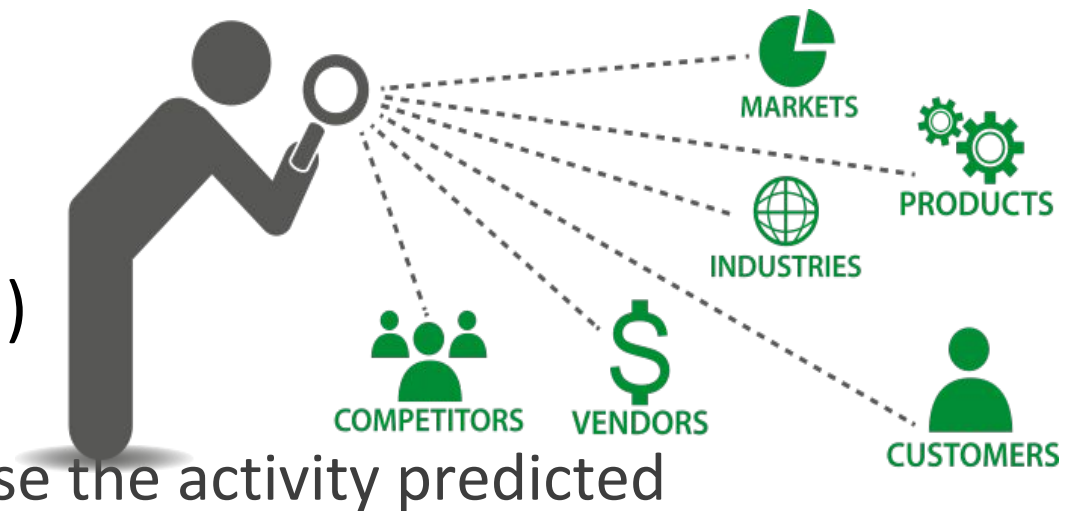
# CURRENT DATA FLOW DIAGRAM



## 4. Competition

# COMPETITION

- Applications such as Google fit
  - No personalization
  - No health tips
- Other hardware devices (e.g. MI Band)
  - High Cost for better accuracy
  - Doesn't allow other applications to use the activity predicted
- Google's adsense
  - Potential of pulling business (quarterly) from the 19.1 billion USD ad market of Google



## 5. Minor Hurdles

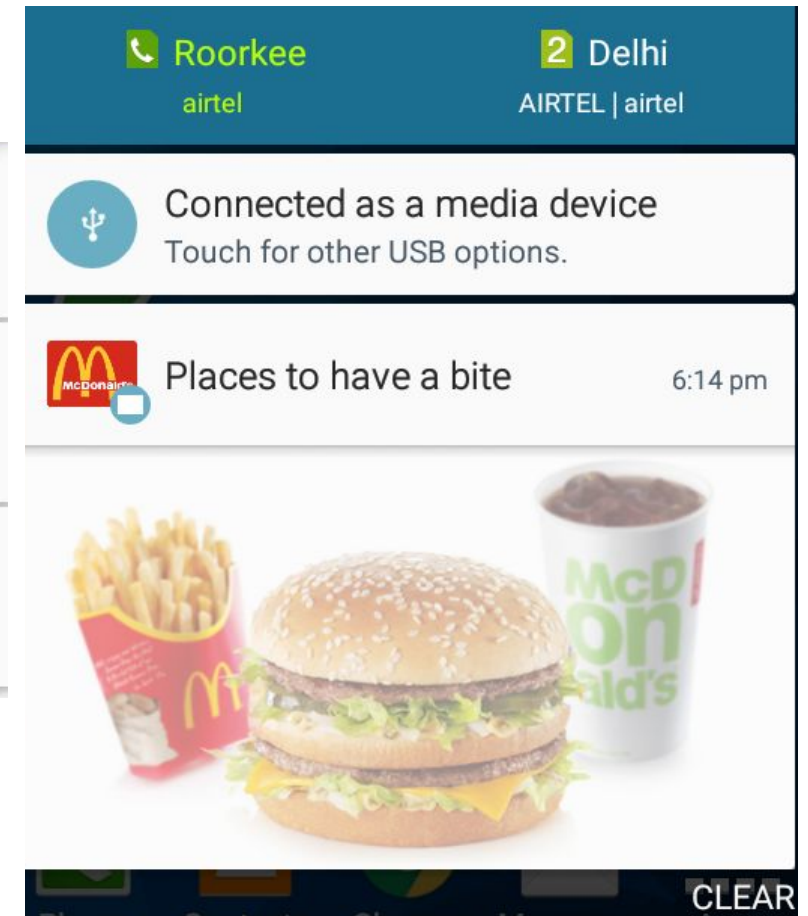
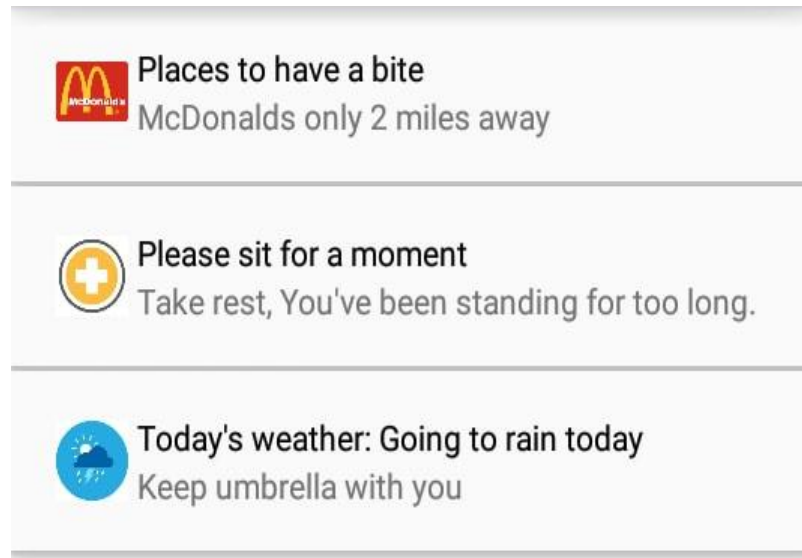
## MINOR HURDLES

- Battery consumption
- Need of more data
- Continuous research in development of filters for ads.

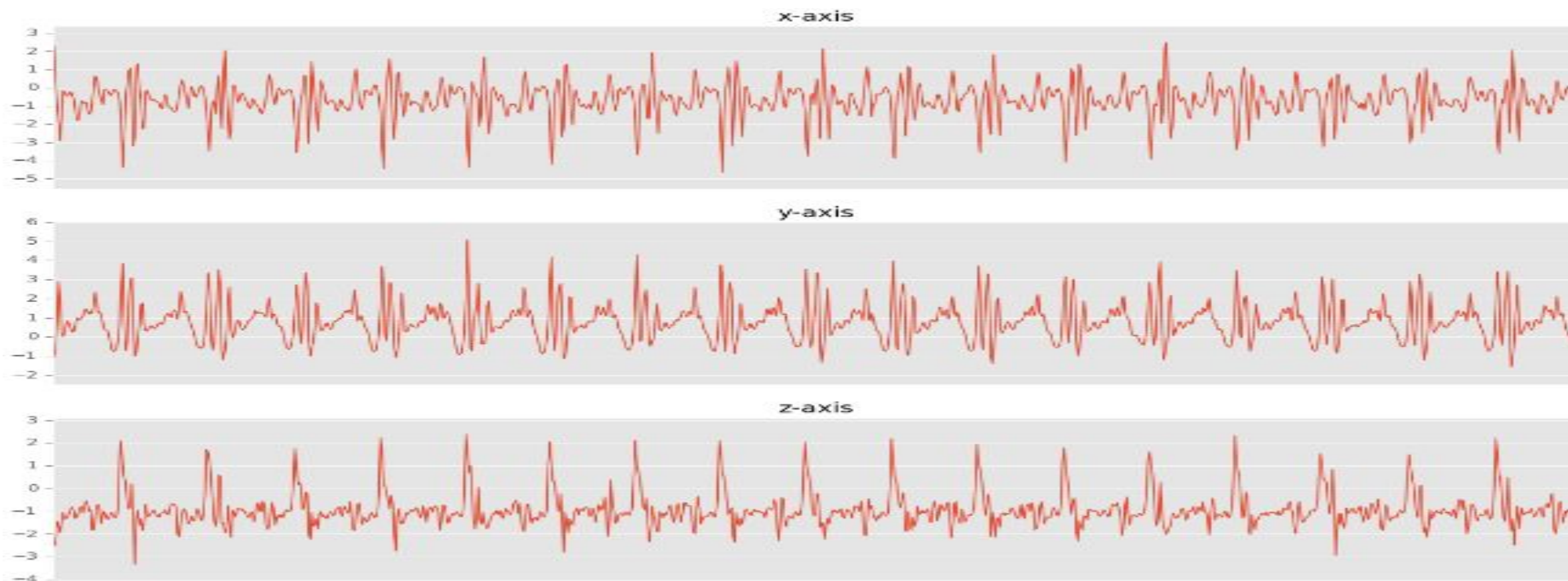


## 6. Prototype Demo

# PROTOTYPE DEMO



# EXAMPLE OF WALKING PATTERN



## 7. Revenue Model

# REVENUE MODEL

1. Direct ads from the companies.
  - a. Product ads from companies
  - b. Recommendation of articles, music etc.
2. Providing SDK to the developers
  - a. To use the activity predicted in their applications
3. Purchasing pro version of Smart Assistant

**Fact:** 35 % (avg) spending on digital marketing by companies and close to 100% for e-commerce companies

# INVESTMENT COST

Estimated Development cost				
Profession / Post	Number of people required	Duration	Cost per 30 days (in Lakhs)	Total cost (in Lakhs)
ML engineers	2	50 - 60 days	1.5	5.5
Android Developer	2	30 days	1.25	2.5
Web Developer	1	20 - 30 days	1.25	1.25
Market and Content Research	1	20 - 30 days	1	1
Tester	1	20 - 30 days	0.8	0.8
Maintenance	-	6 months	-	3
Extras	-	-	-	1
<b>TOTAL COST</b>				<b>15.05</b>

# REVENUE GENERATION

- Assumptions
  - (non-paid) users at the end of 1st month = 10,000
  - Paid users of our Smart Health assistant = 10,000
  - Ads shown per (non-paid) user per day = 3
  - Revenue generated per day = Rs. 1000 = \$14.683
  - linear growth in number of users per month= 20%
- Revenue generated from
  - (non-paid) users
  - from paid users = Rs 25\*10,000 = Rs 2,50,000
  - SDK/API = Rs 1,00,000

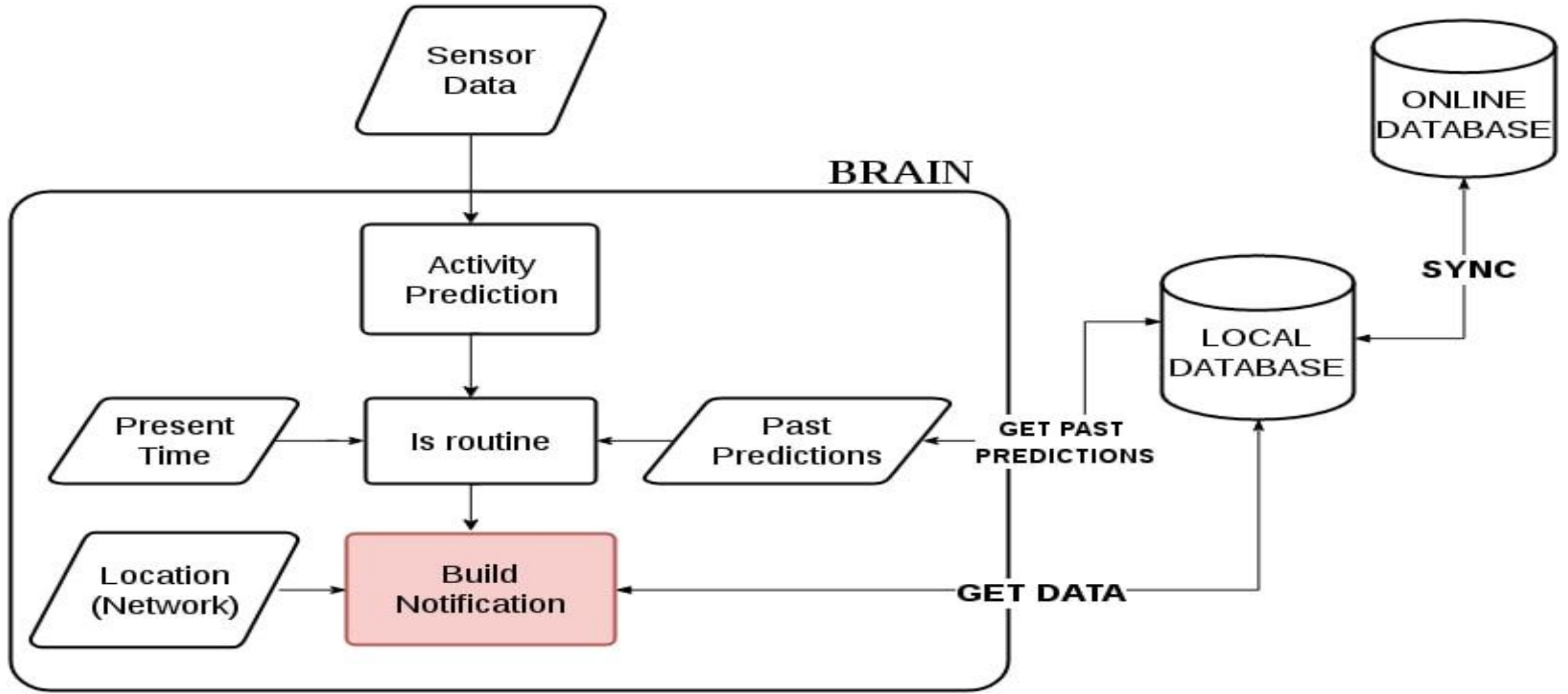
Revenue at the end of 1st financial year = Rs. 15,50,000 = \$22759

\*Parameters used - PPC, PPI, PPL, PPS

## 8. Future vision



# COMPLETE FLOW DIAGRAM



# FUTURE VISION AND SUPPORT NEEDED

- Vision
  - Provide easy integrable SDK/API to the developers
  - Include more activities by generating data
  - Learn user's schedule, likes and dislikes
  - Making it a **Smarter Personal Fitness Assistant**
  - Finding more areas where activity detection will be useful.
- Support needed
  - Initial promotions
  - Easy integration into Hitachi products
  - Professional developers and market researchers



THANK YOU