

MOTIVATION

- Diabetes affects millions of people worldwide
- Traditional methods of management that rely on manual input of data are inefficient
- Smartphones are widely available and they have the capabilities to make diabetes management more effective
 - By utilising built-in functionalities such as access to sensors and other data
 - As well as their capability of accessing and processing data from anywhere and have social connectivity

AIMS

- Create an open sensing smartphone framework for diabetes management that combines smartphones and external sensors to form a sensory system and collect data applicable to diabetes management
- Data analysis and output directly on smartphones to provide guidance information for diabetes management

METHODS

Data input

- Automatic collection
 - FitBit activity tracker
 - Exercise information
 - Sleep monitoring
 - Smartphone sensors
 - Smartphone data
- Manual input
 - Glucose level
 - Diet (Using FitBit food database)
 - Additional exercise activities

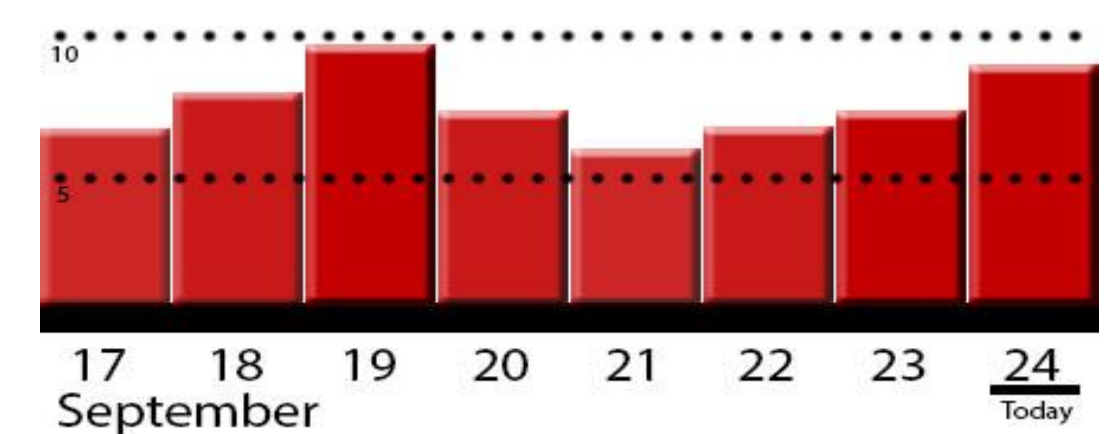
Tools

- FitBit
 - Wearable sensor; multiple form factors
 - High compatibility API
 - Extensive food database with nutritional information

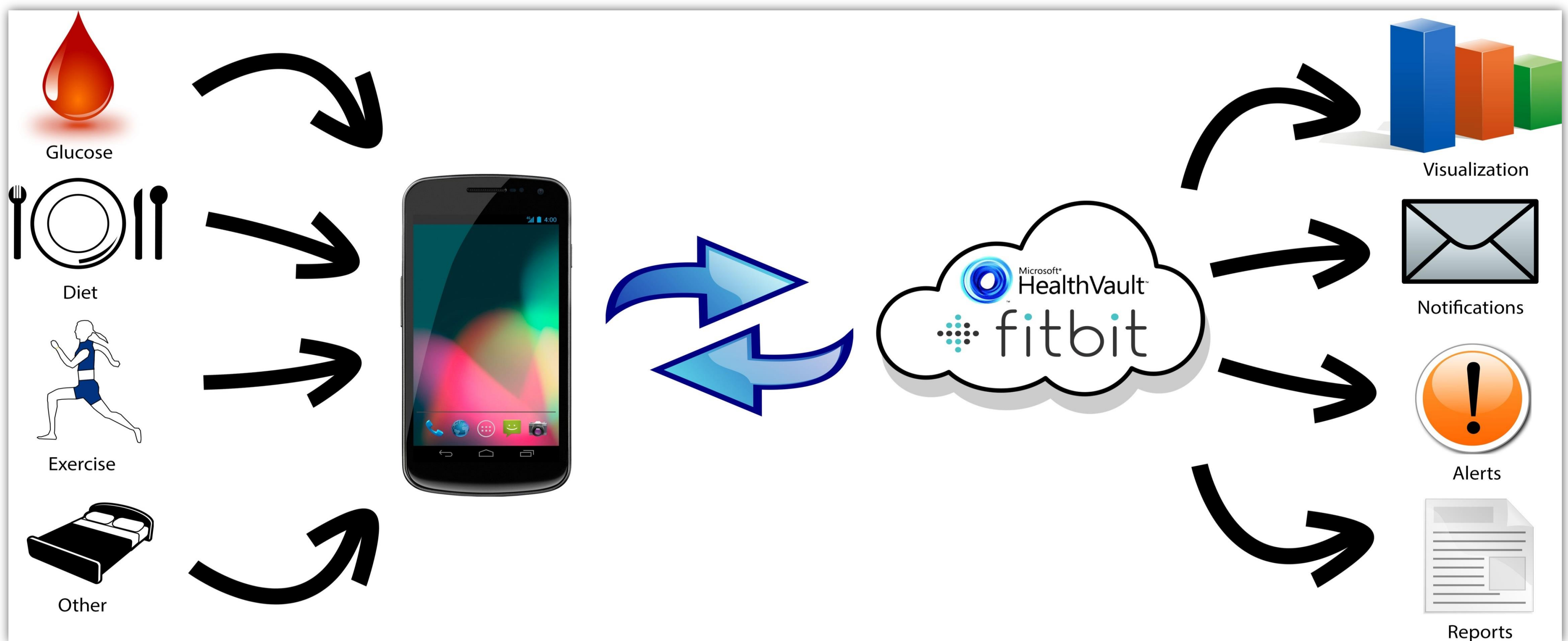
- HealthVault
 - Account authorisation allows external access to data collected by framework
 - Health professionals; family
 - Applications and devices

Data output

- Timeline overview of daily average blood glucose trend along with data collected. Navigate data by tapping on graph

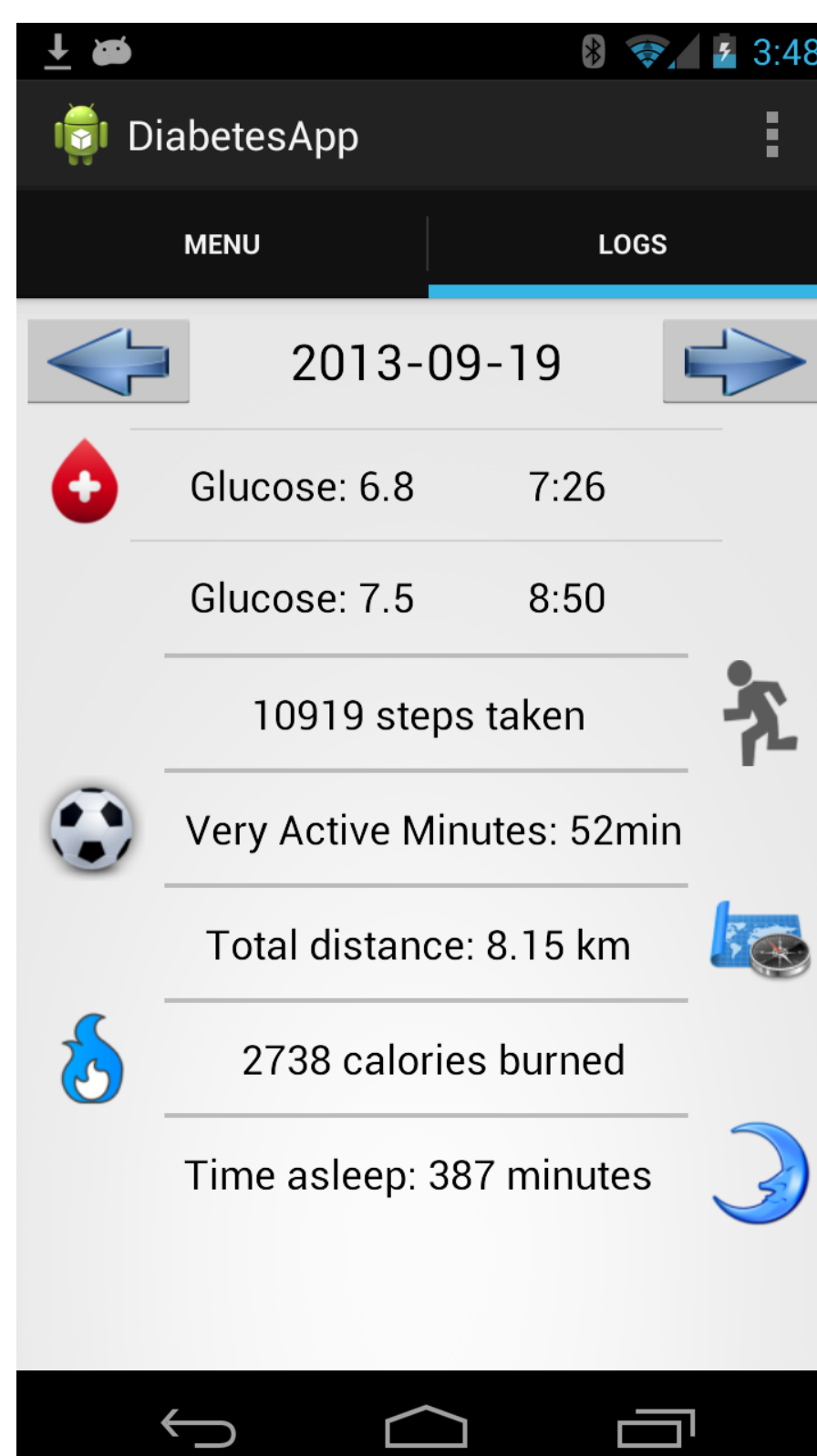


- Alerts and notifications
 - Customisable by the user
 - Glucose check, medication, exercise reminders
 - High carbohydrate intake alert



RESULTS

- Effective collection of data using sensory network
- Data is processed and stored locally and on the cloud for external access
- Information provided to user to assist in the management of diabetes
- User is able to use the framework to input a wide range of information to be processed along with the automatically collected data
- Throughout a day of using the framework, a user will:
 - Input blood glucose levels
 - Record meals eaten
 - Receive processed information and adjust behaviour accordingly for the future



CONCLUSION

- An open sensing framework which captures data automatically from sensors, combined with other data commonly available on smartphones, and outputs essential information for effective diabetes management in the form of a companion smartphone app

FUTURE WORK

- Implement the ability for the framework to recognise trends in the data.
- Discover correlations between the different data types captured by the framework.
- Introduce integration with glucose meters to achieve faster and more convenient input of blood glucose levels
- Undertake clinical trial to evaluate the effectiveness of the framework