

# MOBILE VISUALISATION TECHNIQUES FOR LARGE DATASETS

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**Investigator:**

**Motebang Lebusa**

**Supervisors:**

**Prof: Hannah Thinyane**

**Mrs. Ingrid Siebörger**

# Project Overview

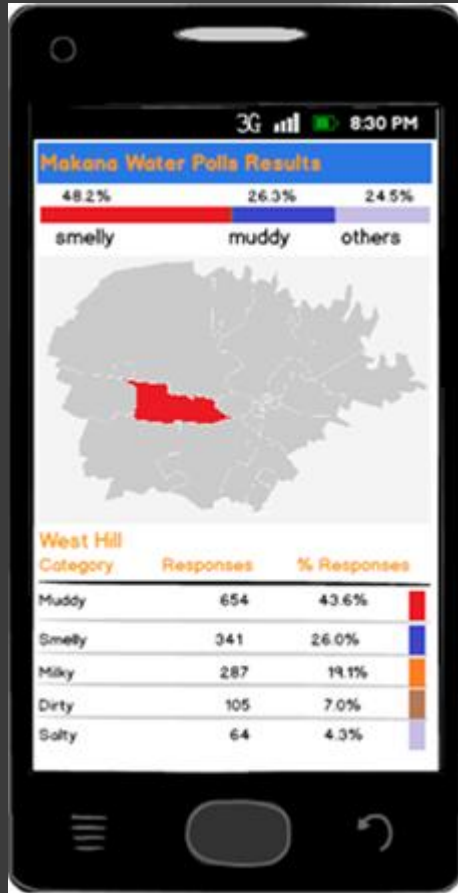
- ⦿ Research goals
- ⦿ Design
- ⦿ Implementation
- ⦿ User evaluation
- ⦿ Results
- ⦿ Future work

# Research goals

- ① *Review* visualisations for mobile phones
- ② *Develop* a visualisation prototype based on findings
- ③ *Evaluate* the visualisation prototype

# Design

## ● Balsamiq Mockups



Geographical  
details

Categorical  
details

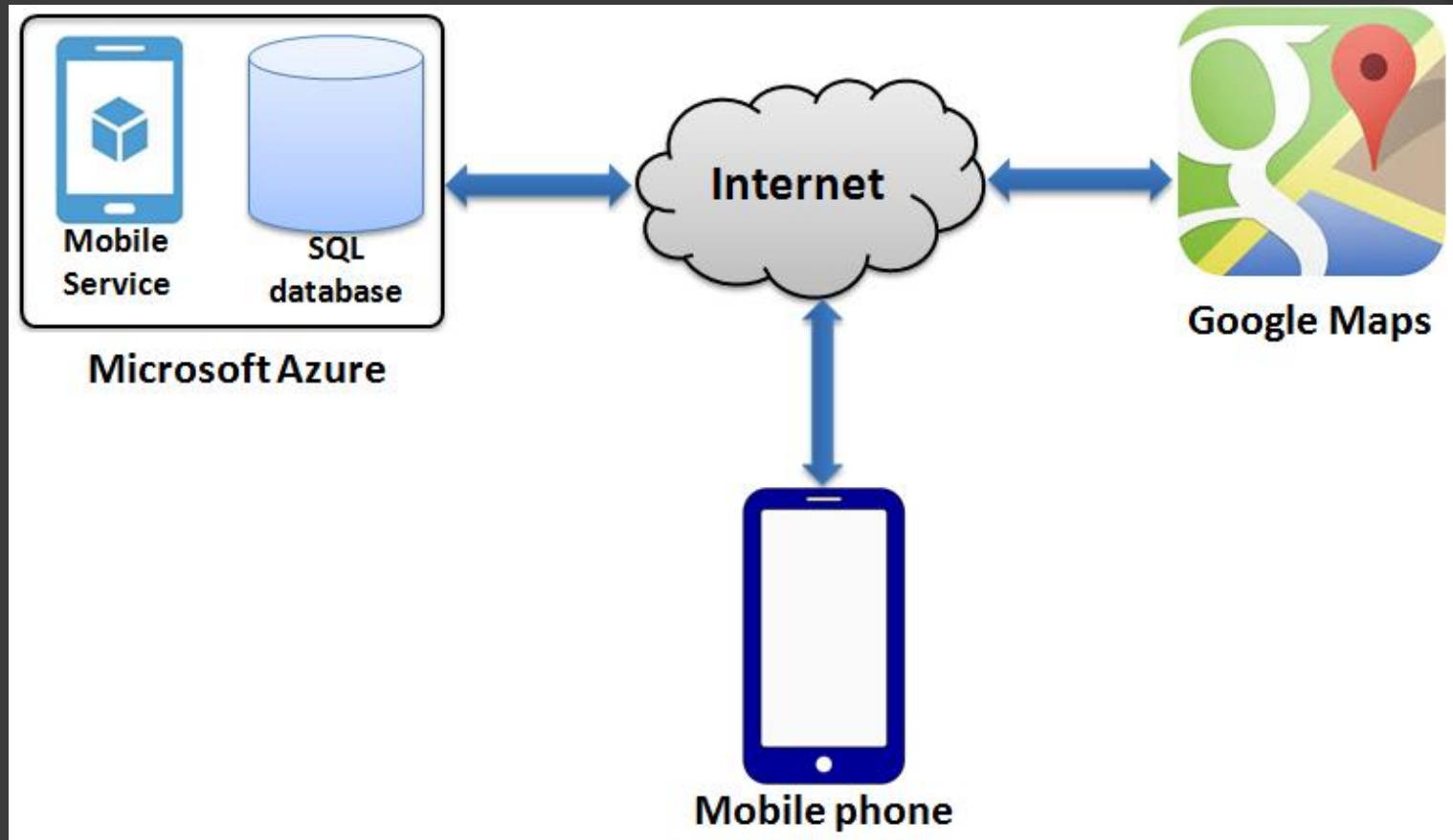
# Development (1)

- ◎ **Android/Android Development Toolkit (ADT) Plugin**
  - Freely available, native platform, lots of technical online support
- ◎ **Google Maps API**
  - Also freely available, easy to integrate Google Maps into apps and embed maps into app, automates tasks like connection to Google Maps servers and responding to map events

# Development (2)

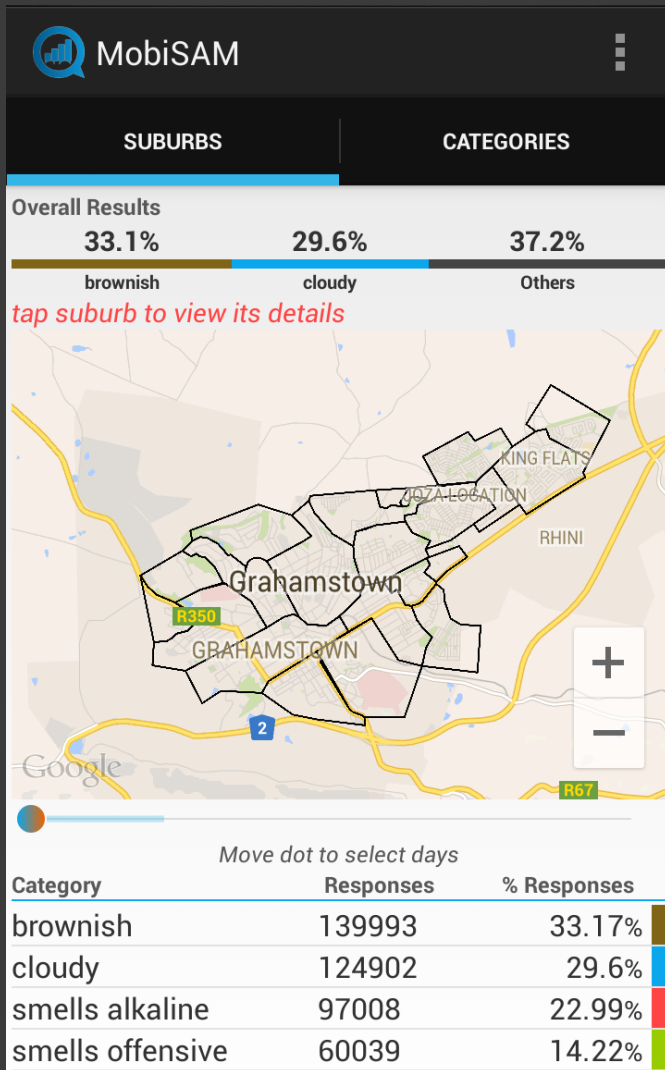
- ◎ **Microsoft Azure** – cloud platform, chosen for:
  - **SQL DB storage**: all data used for the viz is hosted in Azure
  - **Mobile Services**: enables custom logic to be added to app and handles data connections, push notifications, etc.

# Development (3)

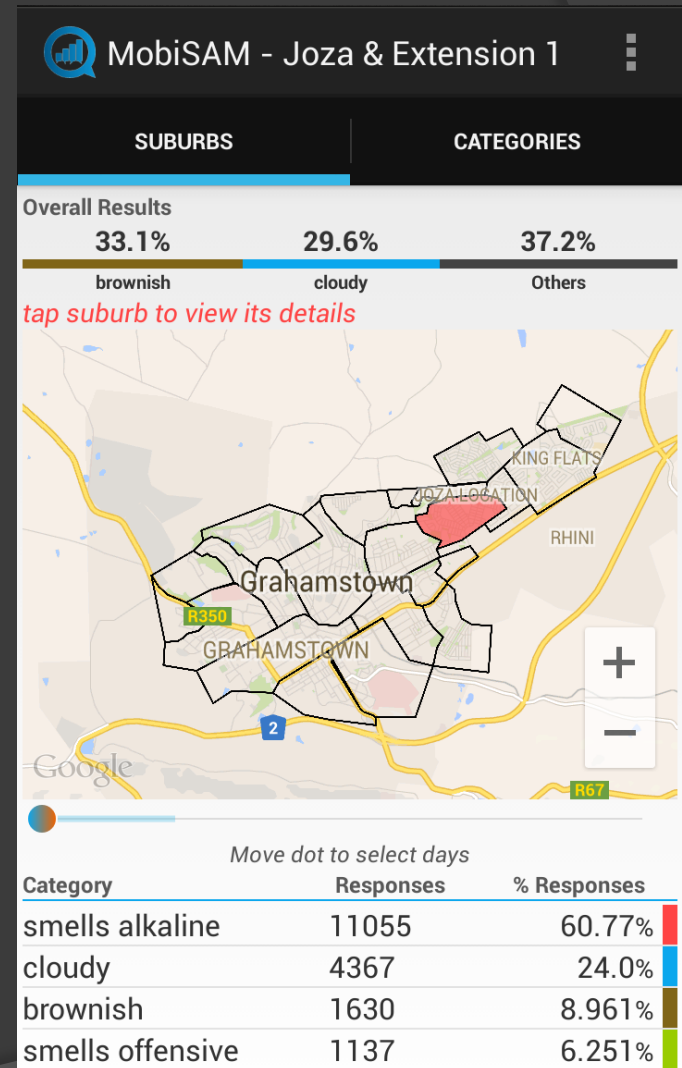


Entire visualisation system architecture

# Development (4)



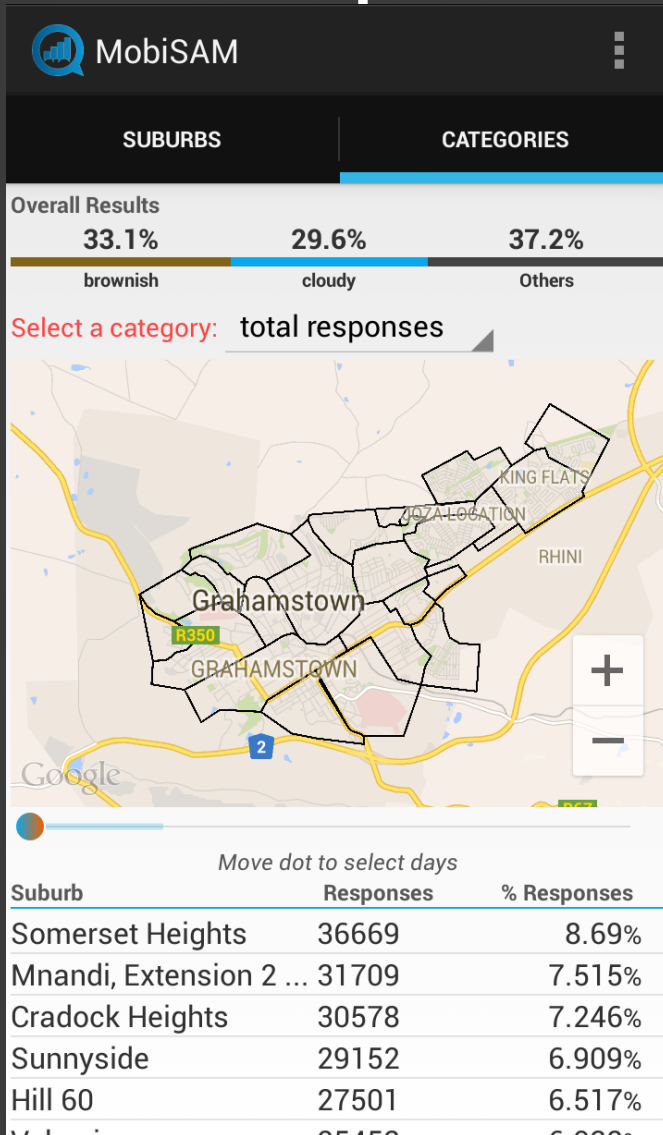
Overall details for all suburbs



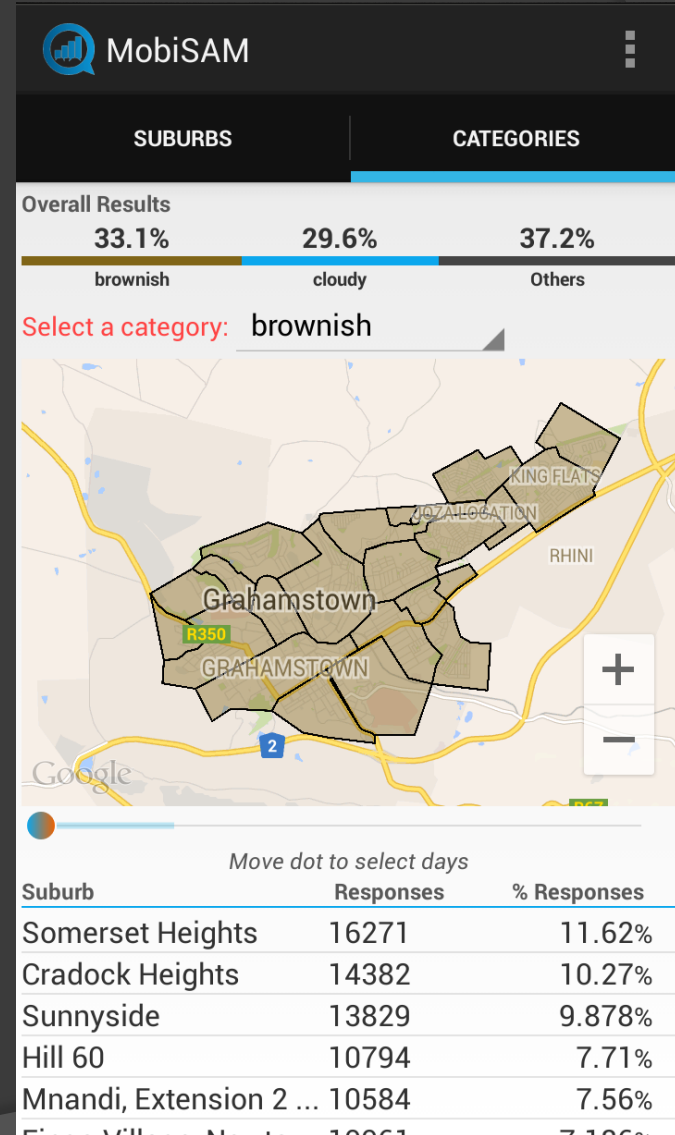
Details for one suburb



# Development (5)



Overall details for all categories



Details for one category

# User Evaluation

## ⦿ Experiment design

- Usability
- Feedback on usability
- Feedback on UX

## ⦿ User Test

- 11 participants tested the prototype
- Recordings, observations & a questionnaire were used for data gathering

# Results (1)

Q1 - TASK	(i) [4]				(ii) [5]					(iii) [5]					(iv) [1]	(v)[1]	(vi)[1]	(vii)[1]	TOTAL	Score
Participant 1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	100%
Participant 2	1	1	1	1	1	0	0	0	0	1	0	0	0	0	1	1	1	1	10	56%
Participant 3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	100%
Participant 4	0		0		1	0	0	0	0	1	1	1	1	1	1	1	1	1	10	56%
Participant 5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	100%
Participant 6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	100%
Participant 7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	100%
Participant 8	0				1					0					1	1	1	1	5	28%
Participant 9	0				1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	78%
Participant 10	0				1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	78%
Participant 11	0				1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	78%
	6	6	6	6	11	8	8	8	8	10	9	9	9	9	11	11	11	11	14	79%

- Usability – 79% of set tasks achieved
- Increasing success from first to last question
  - Question 1 (i) dealt poorly – due to little familiarity with the viz

# Results (2)

## ⦿ Usability feedback

- positive

- Ease of use – *touch/tap*
- Simple layout – *minimal widgets*
- Integration of Google Maps led to *intuitiveness*

- negative

- Slider was too small, difficult to use
- List items were clickable but did not provide any more information

# Results (3)

- ◎ UX feedback
  - Informative
  - Nice and user friendly
  - Touch interface pleasant (no typing required)
  - Intuitiveness provided by Google Maps

# Limitations

- ⦿ Development on one platform – Android
- ⦿ User input not incorporated after evaluation – time (e.g. colour opacity not distinct in viz, slider was difficult to use)

# Future work

- ① Incorporate suggestions from evaluation
- ① Develop on other platforms e.g. iOS, Windows
- ① Include more data types

**Q & A**