

FIG

FIG WORKING WEEK 2017

Helsinki Finland

29 May - 2 June 2017

Presented at the FIG Working Week 2017,  
May 29 - June 2, 2017 in Helsinki, Finland

# TOWARDS THE AUGMENTED REALITY OF BOTSWANA TRIBAL VILLAGES

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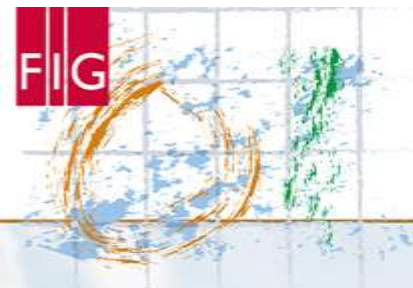
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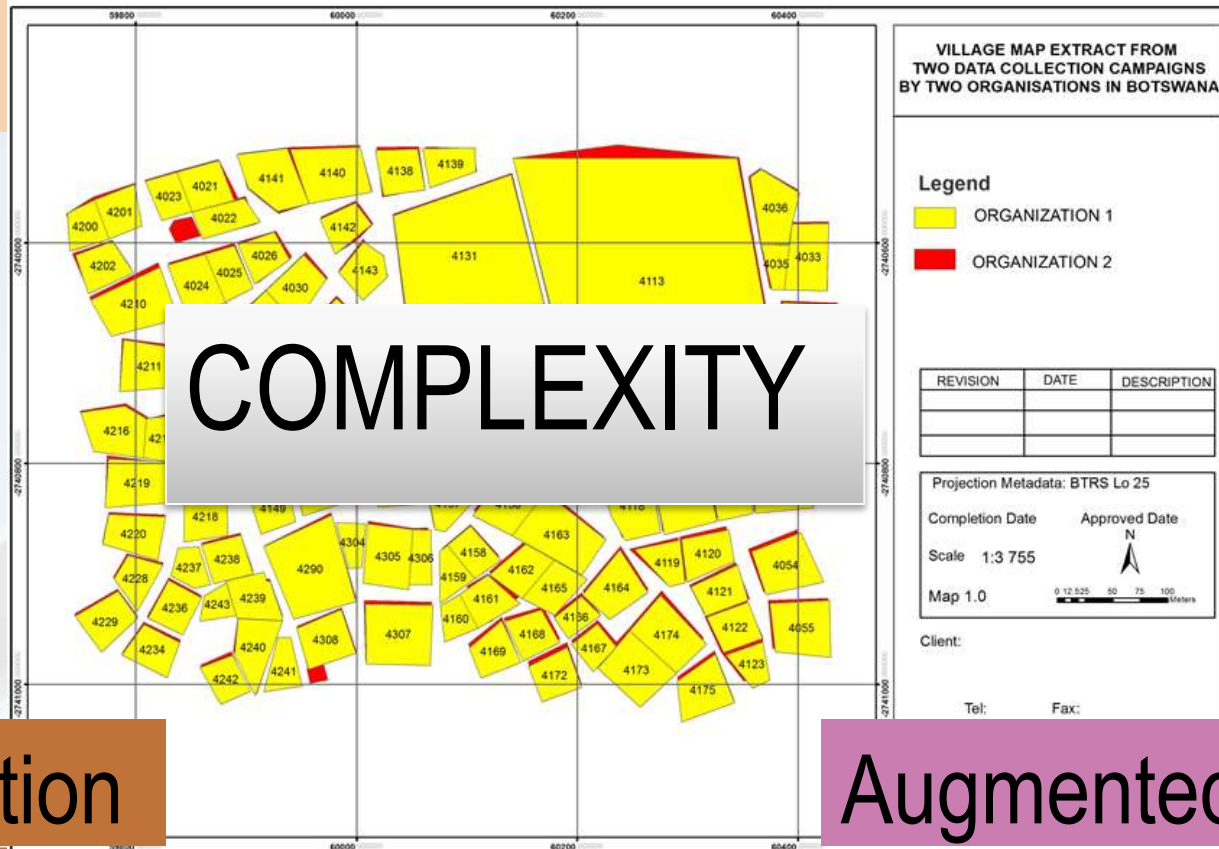
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## Introduction

Mental



Paper

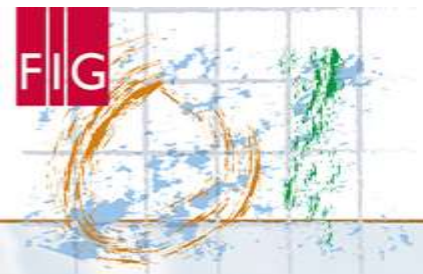
Digitilisation

Augmented Reality



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## Mental and Paper Systems

### Mental Systems

- 1976 Backwards
  - Chiefs
  - Clansman
  - Land Board (1970)
  - Poor categorisation of land uses
  - Rapid developments

### Paper Based Systems

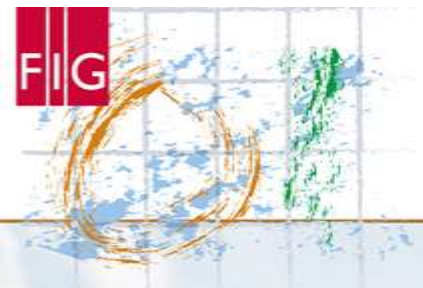
- 1976 to 1990
  - Semi Mental
  - Certificates
  - Leases
  - Sketch plans (1990s)
  - Rapid developments

Slow LA transformation processes Versus Rapid Developments end with uncontrolled development and squatting



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## Digitilization



- Reforms over time
- Land inventory (Not Successful)
- Tribal land management System (Not Successful)
- Land Administration Procedure Capacity and Systems (LAPCAS)
  - Unique Parcel Referencing

**Slow Processes**



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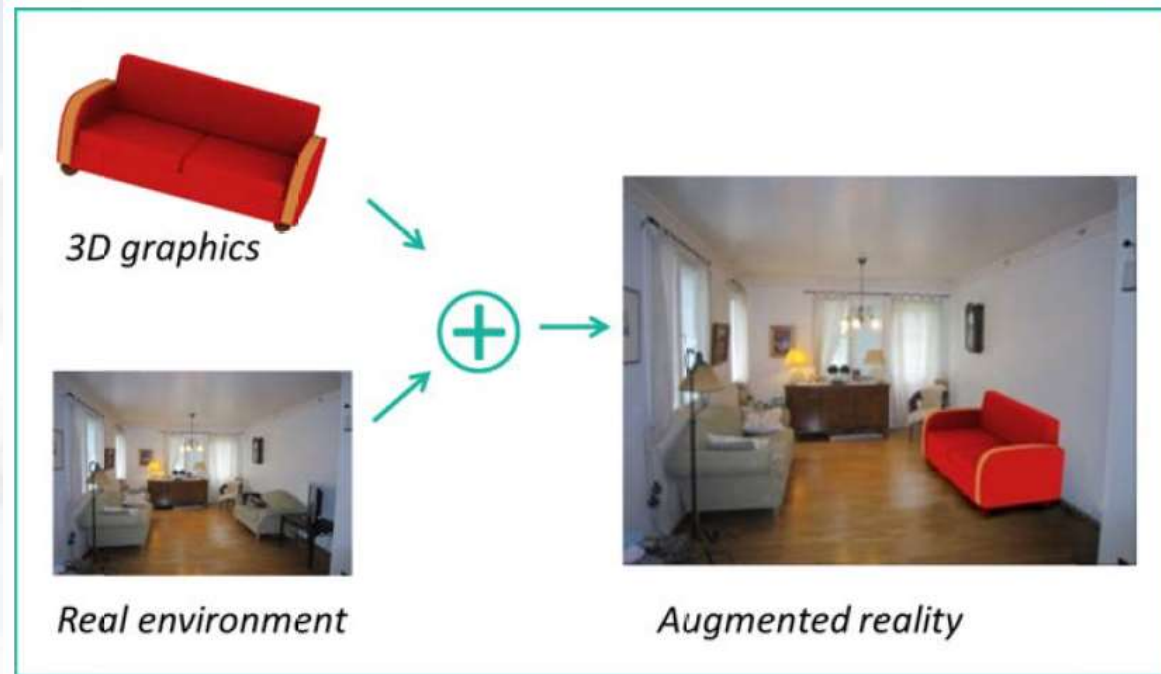
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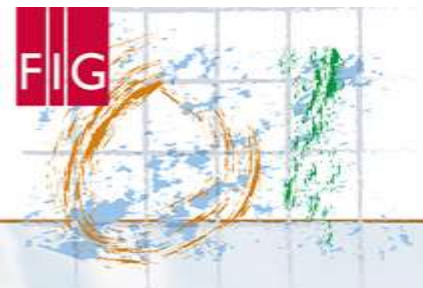
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## Augmented Reality

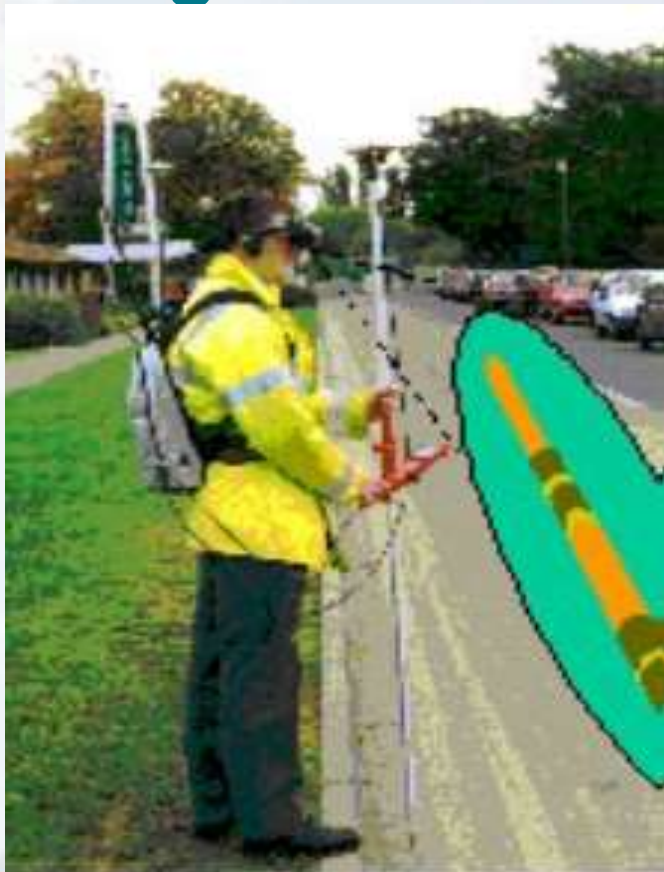
- Computer generated information
- Superimposition
- user's view (Camera)
- Real World
- Several application areas



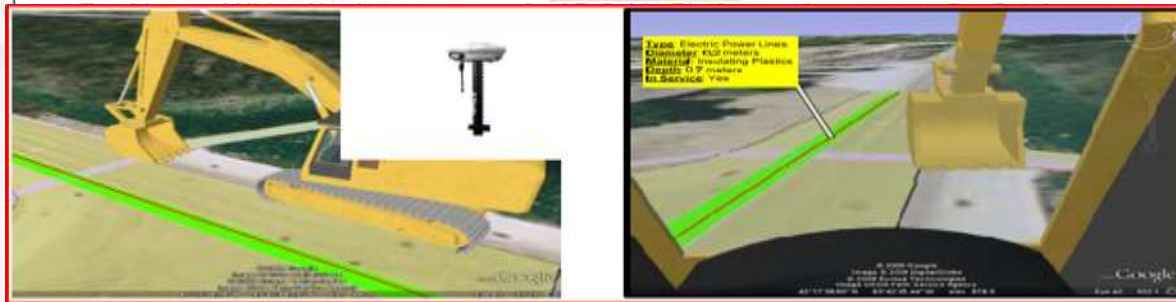
Siltanen (2015). Interior design Augmented reality

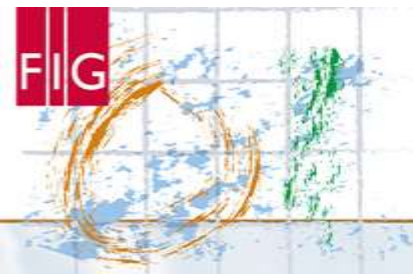


## Augmented Reality and GI



- Roberts et al (2002 ); Talmaki et al (2010)
- Tracker Technology in early 2000
- Virtual Environment
- Augmented Reality





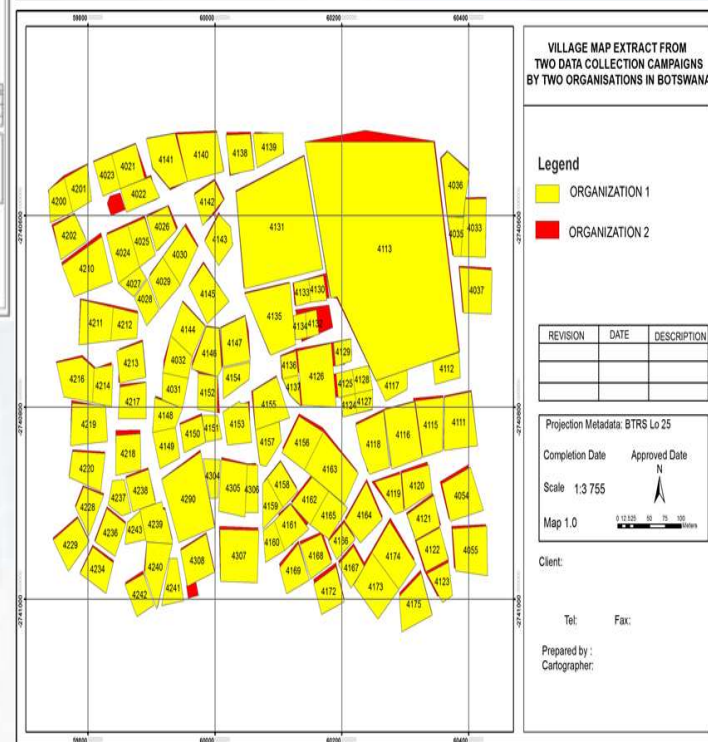
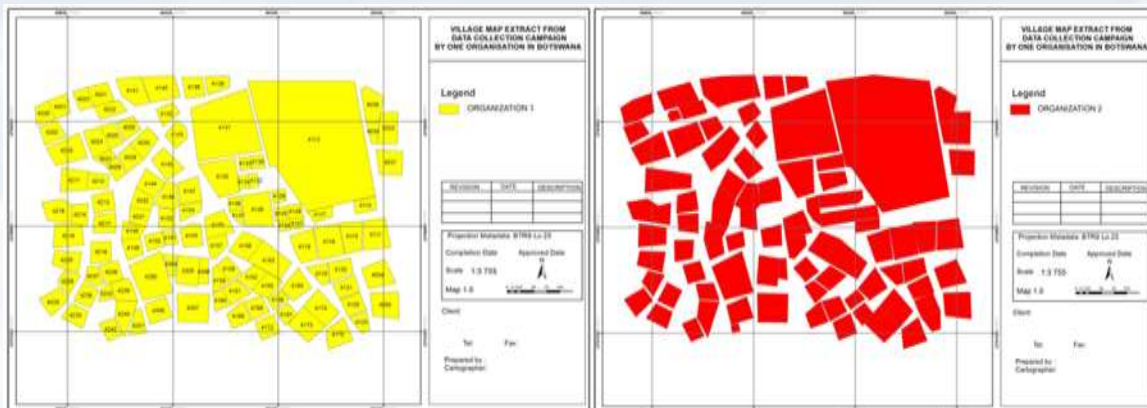
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## Botswana Massive Spatial Information

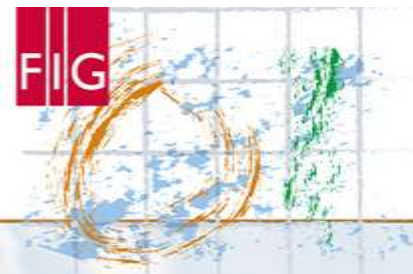


- Data overlay
- Duplication
- Discrepancies
- Survey of all tribal villages
- 2D data only



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## Augmented Reality Opportunities

### Geodatabase development

Table

Sevungal

FID	Shape	STAND_NAME	STAND_AREA	LegalArea1	SR_Num	OSM_NUMBER	TYPE	LOT_NUMBER	LO_BAND	LAND_USE
0	Polygon	31	20189.7682	Square Meter	0	0	Village Lot	31	LO25	
1	Polygon	32	932.38882	Square Meter	0	0	Village Lot	32	LO25	
2	Polygon	33	920.601053	Square Meter	0	0	Village Lot	33	LO25	
3	Polygon	34	911.304738	Square Meter	0	0	Village Lot	34	LO25	
4	Polygon	35	911.930045	Square Meter	0	0	Village Lot	35	LO25	
5	Polygon	37	1381.49591	Square Meter	0	0	Village Lot	37	LO25	
6	Polygon	38	922.883833	Square Meter	0	0	Village Lot	38	LO25	
7	Polygon	39	898.417191	Square Meter	0	0	Village Lot	39	LO25	

- 3D Systems
- Virtual environment
- Property and Building Information Modelling (BIM)
- Utilities survey and modelling
- Roads
- Standards
- Timely response

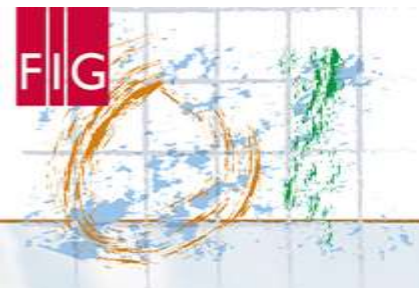
Coordination and Collaboration



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## Current Problem

Slow transformation processes due to underutilisation of Geospatial Information Technologies : **NATION SPECIFIC**

- Accuracy
- Sharing
- Access
- Sustainability
- Development
- Geodata policy
- Data management
- Legal Framework



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## Conclusion

### COMPLEXITY

- Mental Mapping
- Paper Based Mapping
- Digitilisation
- Augmented Reality

### Geospatial Sensory and Systems

- Assembled with GPS receivers (CORS)
- LiDAR profilers and cameras (Back Pecks and Vehicle profilers)
- BIM, GIS
- SDI

Integration, Coordination, Collaboration, Research, Reward, Advancement, Policies



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