



## Getting small is getting big

Georg Gartner  
София 2015



getting small..



getting small..



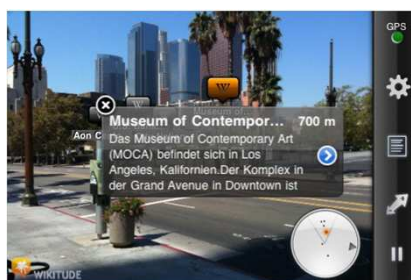
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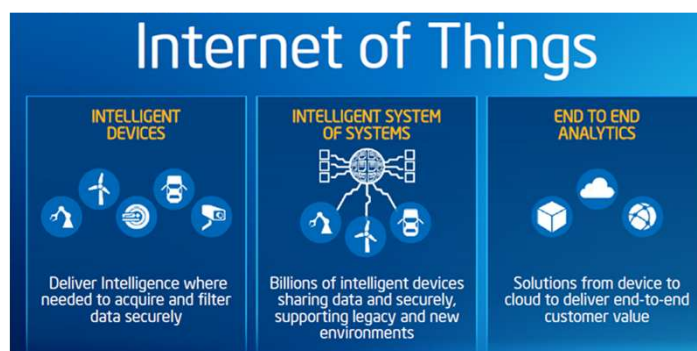
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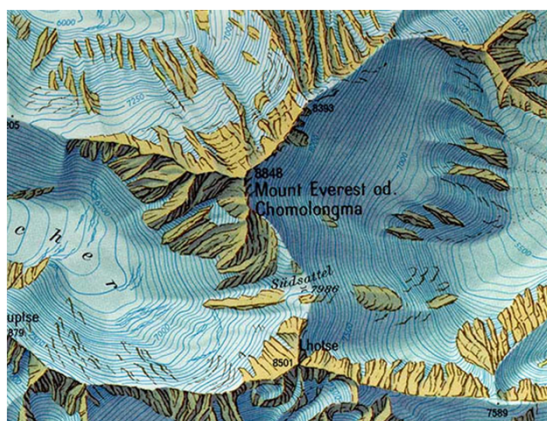


getting big..

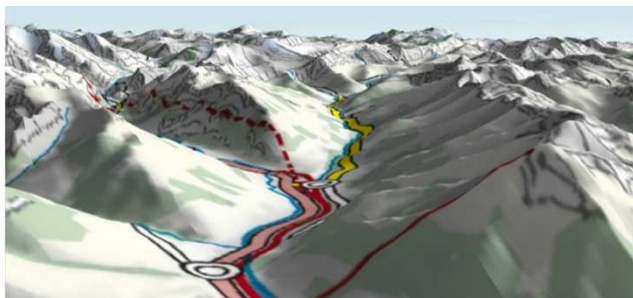


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01133	01133	05305	48820	46652	05305	48820	46652	05305	48820	46652
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00056	00056	81271	45263	56082	81271	45263	56082	81271	45263	56082
22495	22495	34301	46549	58537	34301	46549	58537	34301	46549	58537

Cartography




Cartography



Cartography




**Visions..**



Information is available anytime and anywhere.

**Visions..**



Information is tailored to user's context and needs.





**Visions..**

Location is a key selector for which and how information is provided.



**Visions..**

Services (Location-based-, Geo-, Map-) are wide spread and of daily use.



**Visions..**

Without personal (Location-based-, Geo-, Map-) services people will feel spatially blind.



**Visions..**

Without personal (Location-based-, Geo-, Map-) services people will feel spatially blind, because it

- enables persons to collect data on site accurately and timely



**Visions..**

Without personal (Location-based-, Geo-, Map-) services people will feel spatially blind, because it

- enables persons to see what/who is near them



**Visions..**

Without personal (Location-based-, Geo-, Map-) services people will feel spatially blind, because it

- get supported



## Visions..

Without personal (Location-based-, Geo-, Map-) services people will feel spatially blind, because it

- have an impact on how we work, how we live,  
how we interact




## Heading towards the vision

Technologies


**Heading towards the vision**

Data



**Heading towards the vision**

Use



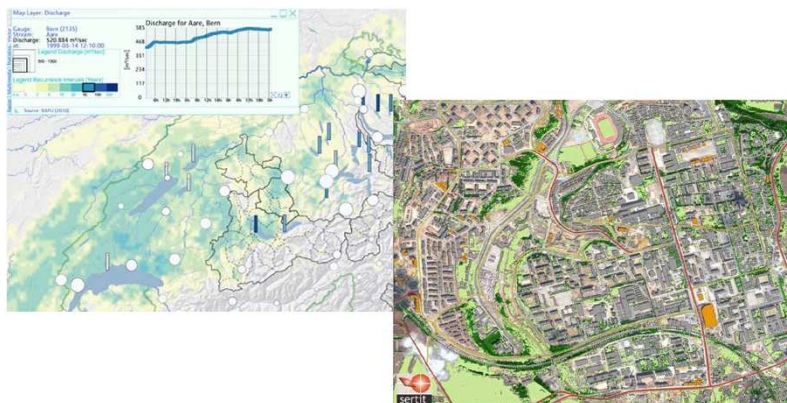


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## Data acquisition and Sensors

### Rapid Mapping, Real-Time Cartography

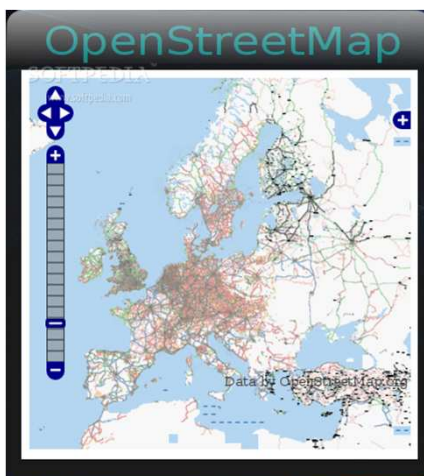


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## Data acquisition and Sensors

### Crowd Sourcing





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## Location Based Services / Mobile Apps



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## 3D and 4D Modelling and Visualisation

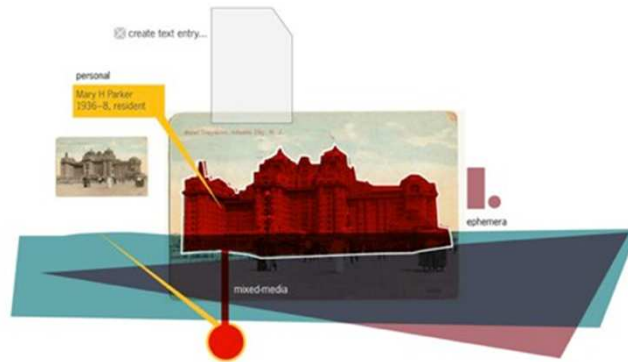




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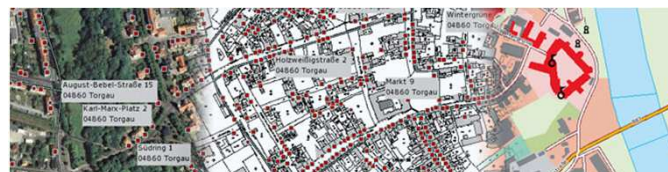
## Geo Media techniques



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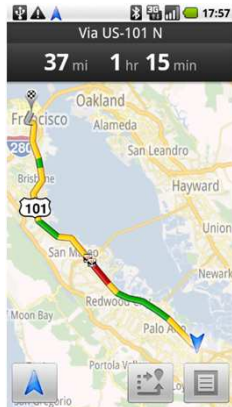


## Geo data infrastructure

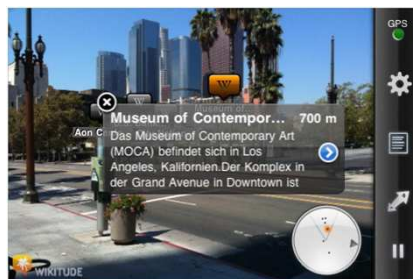




## Navigation



## Mobile guides

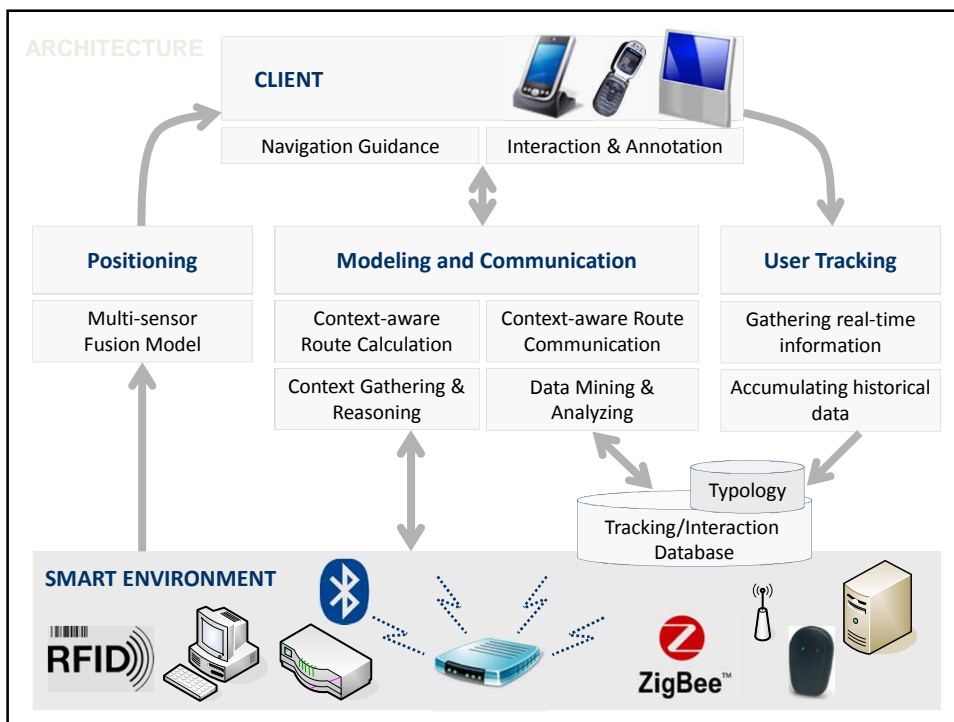
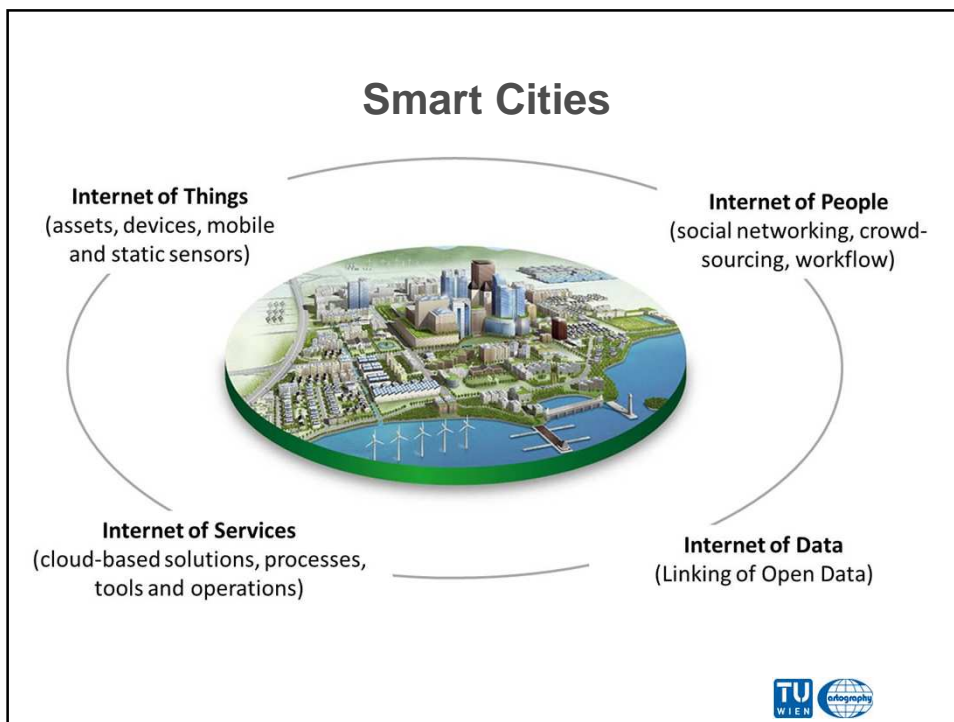


## Location-based game



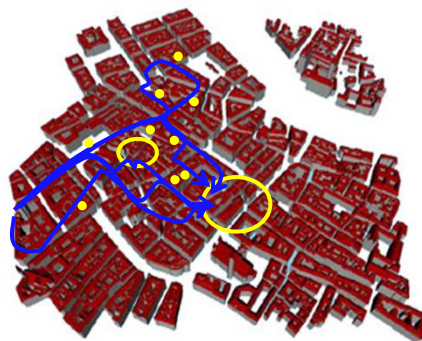
## Social networking







## Behaviour modelling



Which one is the „optimal“ path?



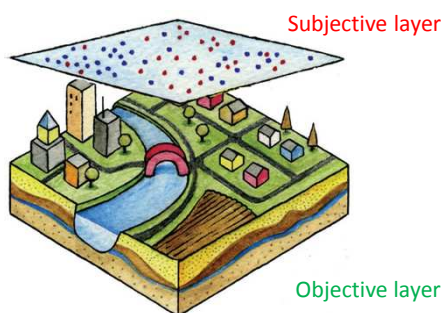
## Behaviour modelling: agglomerative hierarchical clustering

	Cluster 1	Cluster 2	Cluster 3
Gender	f: 40% m: 60%	f: 36% m: 64%	f: 67% m: 33%
Age	~ 30	~ 35-40	~ 30-35
Duration of observation	~ 5 min	~ 10 min	~ 23 min
Speed	~ 1.2 m/s	~ 0.6 m/s	~ 0.2 m/s
Number of stops	almost none	1.4	3.6
Duration of stops	7 sec (max. 1 min)	2.5 min (max. 8 min)	4.7 min (max. 17 min)

..engineering the semantic dimension

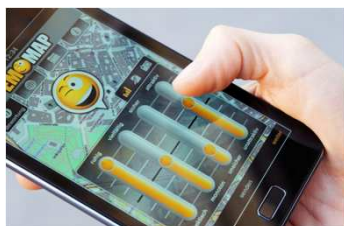


# the „keyhole“ problem





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Consequences

**Promote Information Advocacy and Awareness**

from data-centric 'provider' focus to a **knowledge enabled 'user' focus**

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Consequences

**Embracing trends in Information Technology**

open source, crowd sourcing, SOA, cloud, data  
as a service

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Consequences

**Defining data sharing, accessibility and dissemination**



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Consequences

Assuring the **quality** of information

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Consequences

Future direction of **data creation**, maintenance and  
**management**

**real-time**, sensor networks, data mining, filtering

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Consequences

### **Uses of big data**

ubiquitous use might lead to better decision-making,  
**require appropriate ethical standards**

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Consequences

### **Trends in technology**

Sensors will be **pervasive**, data increasingly  
**interconnected**, emerging relevance of providing  
**relevant** data

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Consequences

### **Legal and Policy Development**

issues of increasing demand for free and open access data, **privacy** challenges

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Consequences

### **Skills requirements and **training** mechanisms**

Being aware of chances and limitations of technologies and data handling