NICTA

From **imagination** to **impact**

Australian Government
Department of Broadband, Communications and the Digital Economy
Australian Research Council

NICTA Members

NICTA Partners

Document Storage And Processing On Mobile Devices

Raymond Wong

NICTA

raymond.wong@nicta.com.au

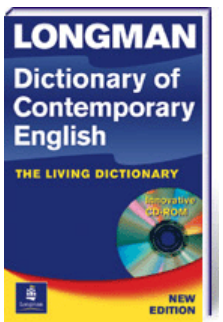
Australian Government
Department of Broadband, Communications and the Digital Economy
Australian Research Council

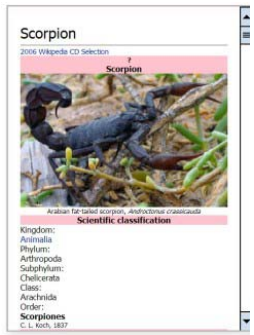
Agenda

- Problems
- Solution overview
- Example applications
- Demonstrations

Unsatisfied market for rich mobile experience

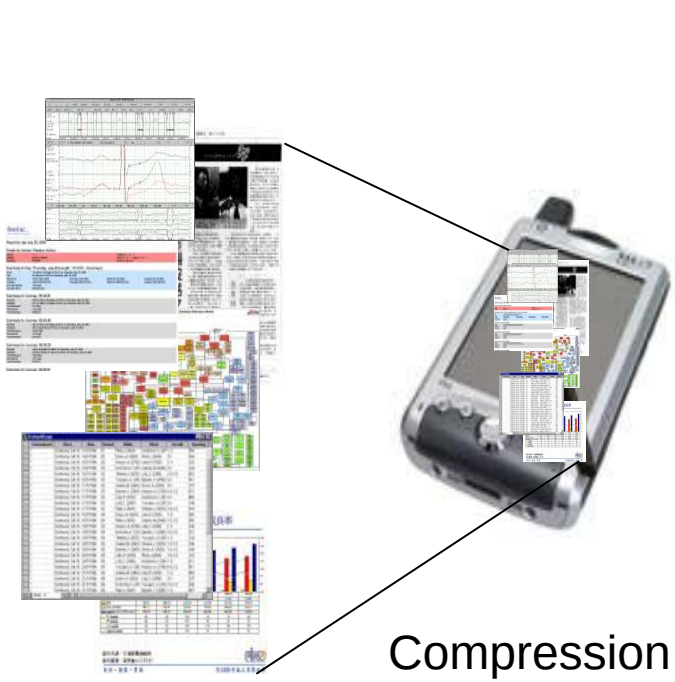
- Lots of data in XML
- Small storage
- Limited bandwidth
- Low computation horse power
- Slow response time



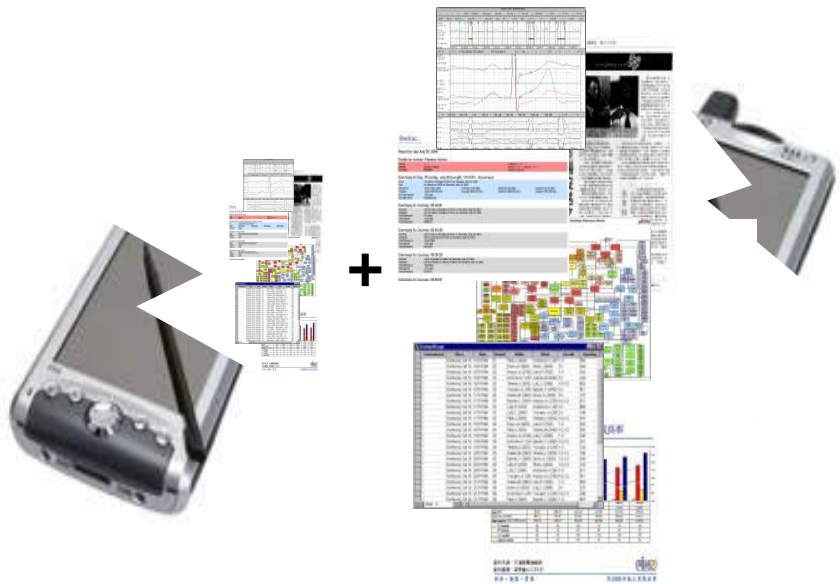


Problem of Traditional Compression (Extra storage & computations)

- Need more storage space and computations !!
  - Need computations for decompression
  - Need space for (compressed + decompressed) data



Compression

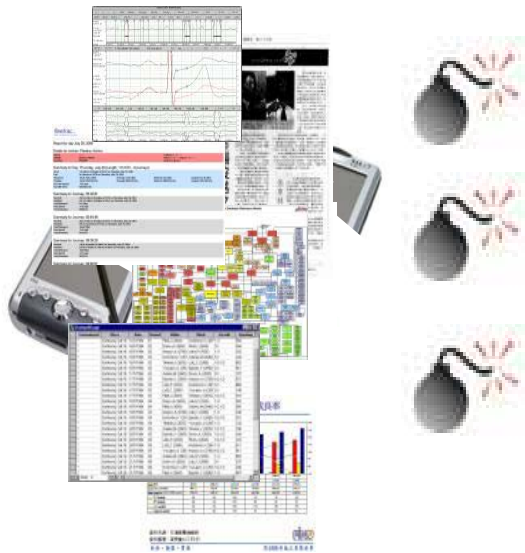


Decompression

Problem of Traditional Compression (Not enough runtime memory)

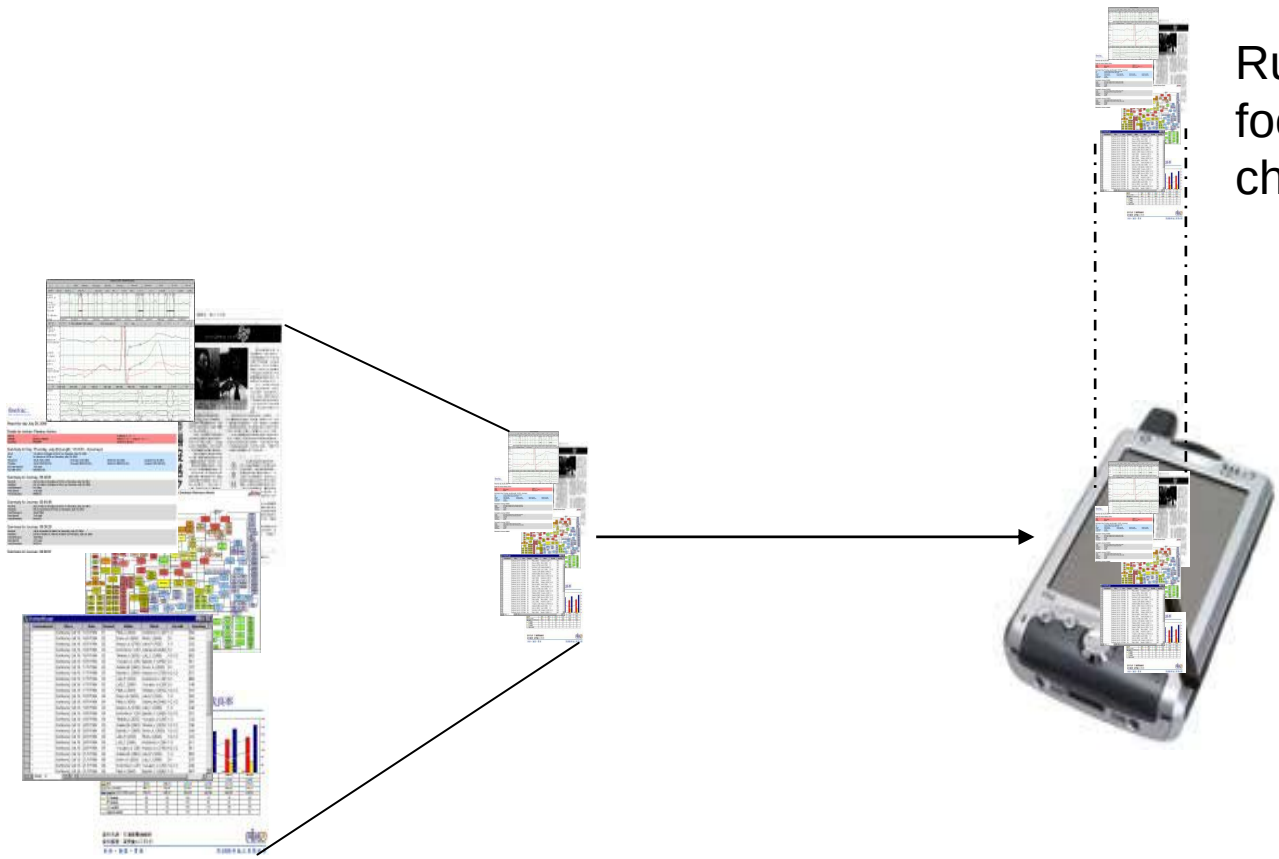
- The runtime footprint can be huge!!!
- e.g., Runtime memory = 10 x original storage size
  => = 50 x compressed doc size

Decompression



Runtime memory footprint

mContext's Compact Storage Scheme



Runtime memory footprint doesn't change

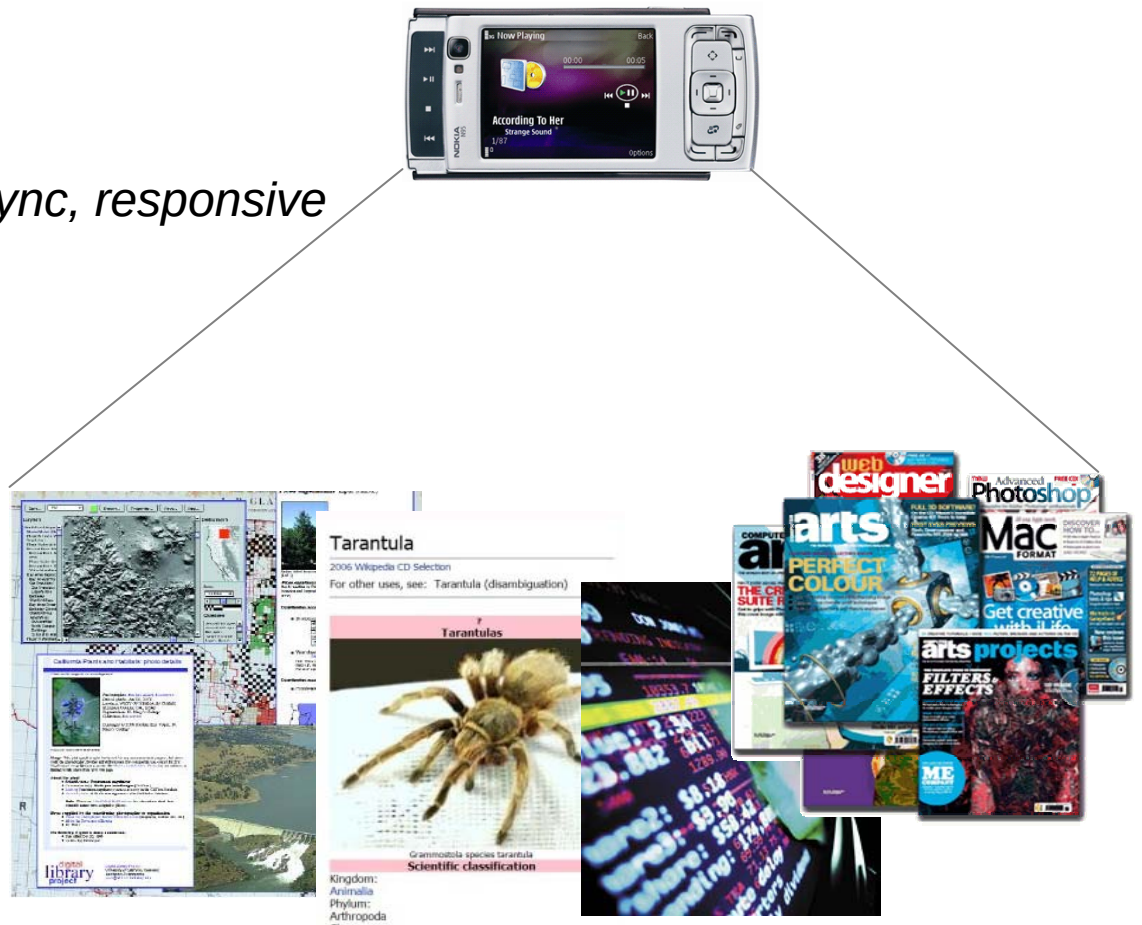
mContext allows you to access content even you are not connected

New user experience:

Faster content

Smaller content

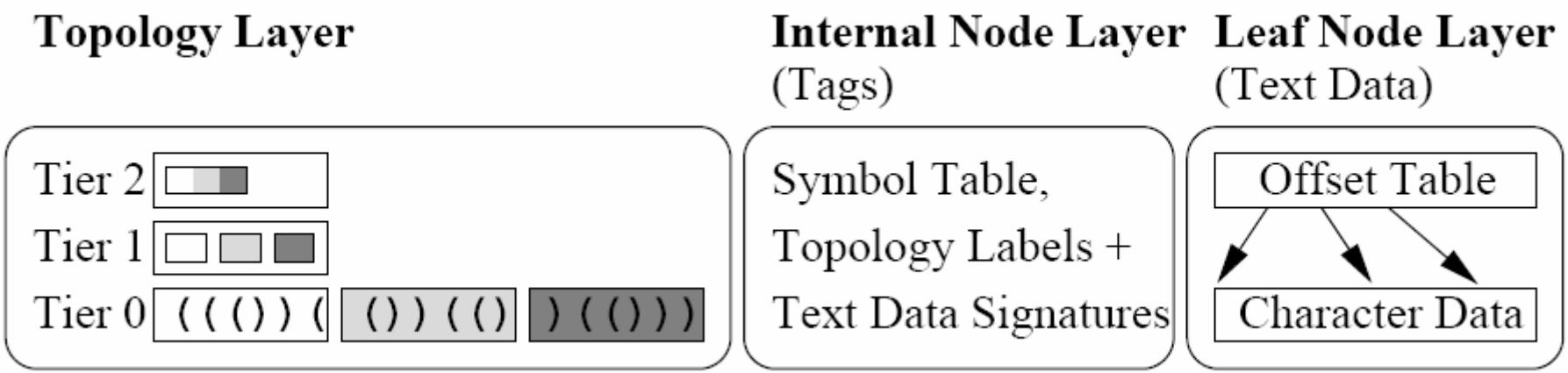
Smarter content: *search, sync, responsive*



mContext's technology (*ref.* Open Publish 2007)

A space-efficient representation of XML data without compromising the query and update performance.

mContext's Storage & Index Structures



Benchmark

100M Data (public domain)	MSXML (100MB)	**mContext** (67MB)
Memory footprint (after loading)	329MB	**67MB**
Loading time	17.8s	**0.67s**
Runtime footprint (search)	333MB	**67MB**
Processing time (search)	1.814s	**0.143s**

Benchmark

100M Data (public domain)	MSXML (100MB)	**mContext** (67MB)
Memory footprint (after loading)	329MB	**67MB**
Loading time	17.8s	**0.67s**
Runtime footprint (search)	333MB	**67MB**
Processing time (search)	1.814s	**0.143s**

Smaller to carry / transfer / store

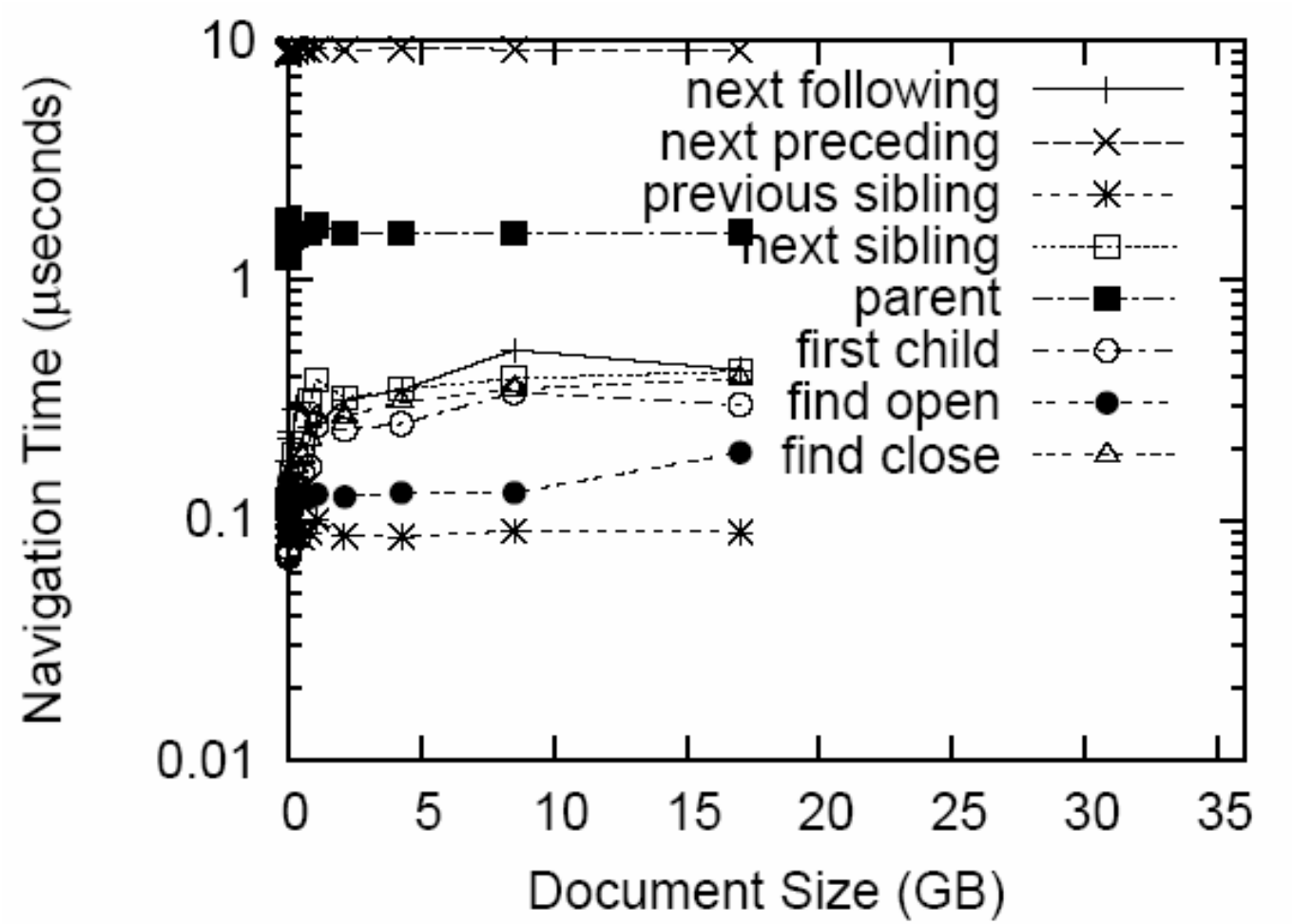
Run on device with less memory

Faster to run

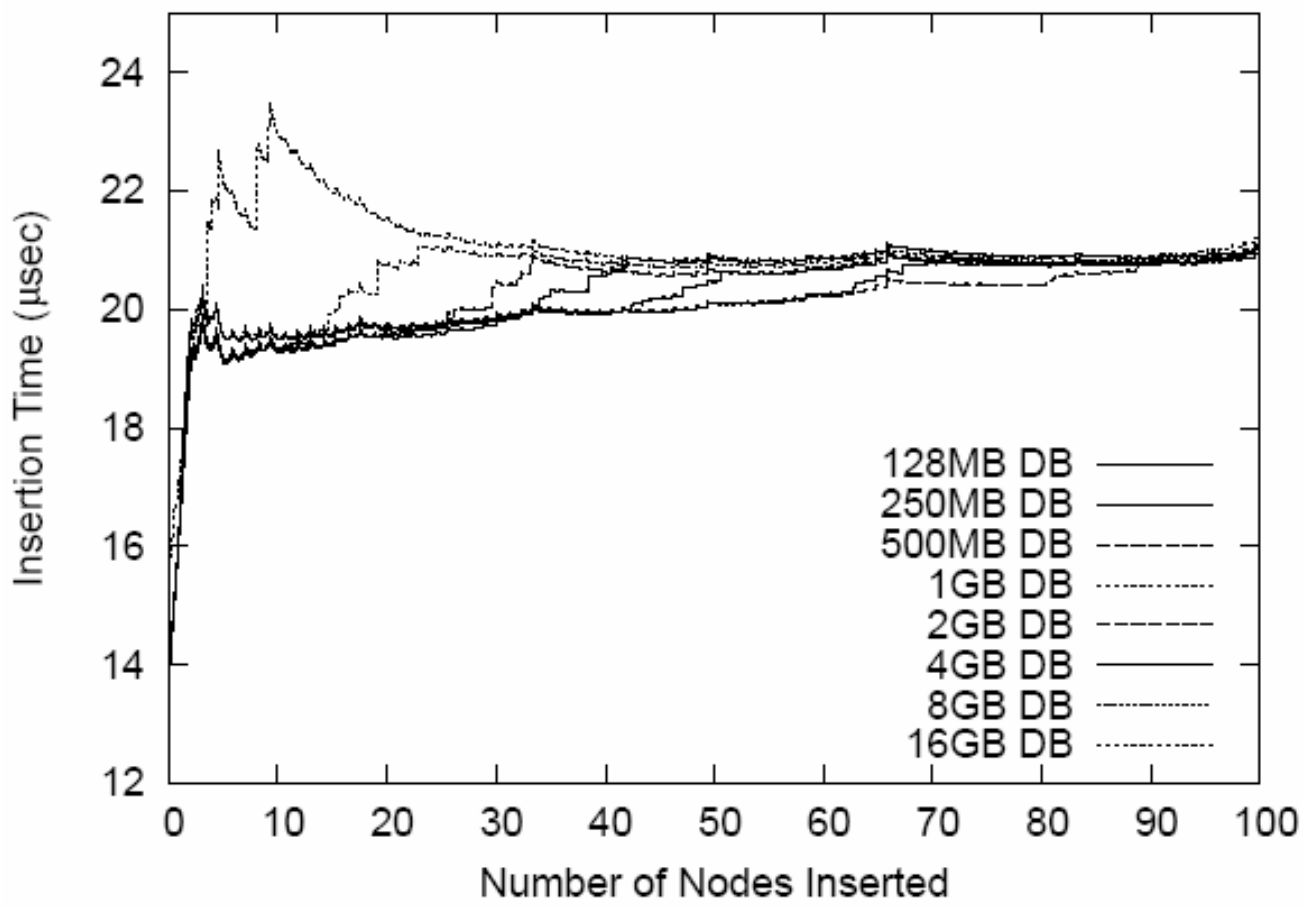
More scalable

More responsive to user

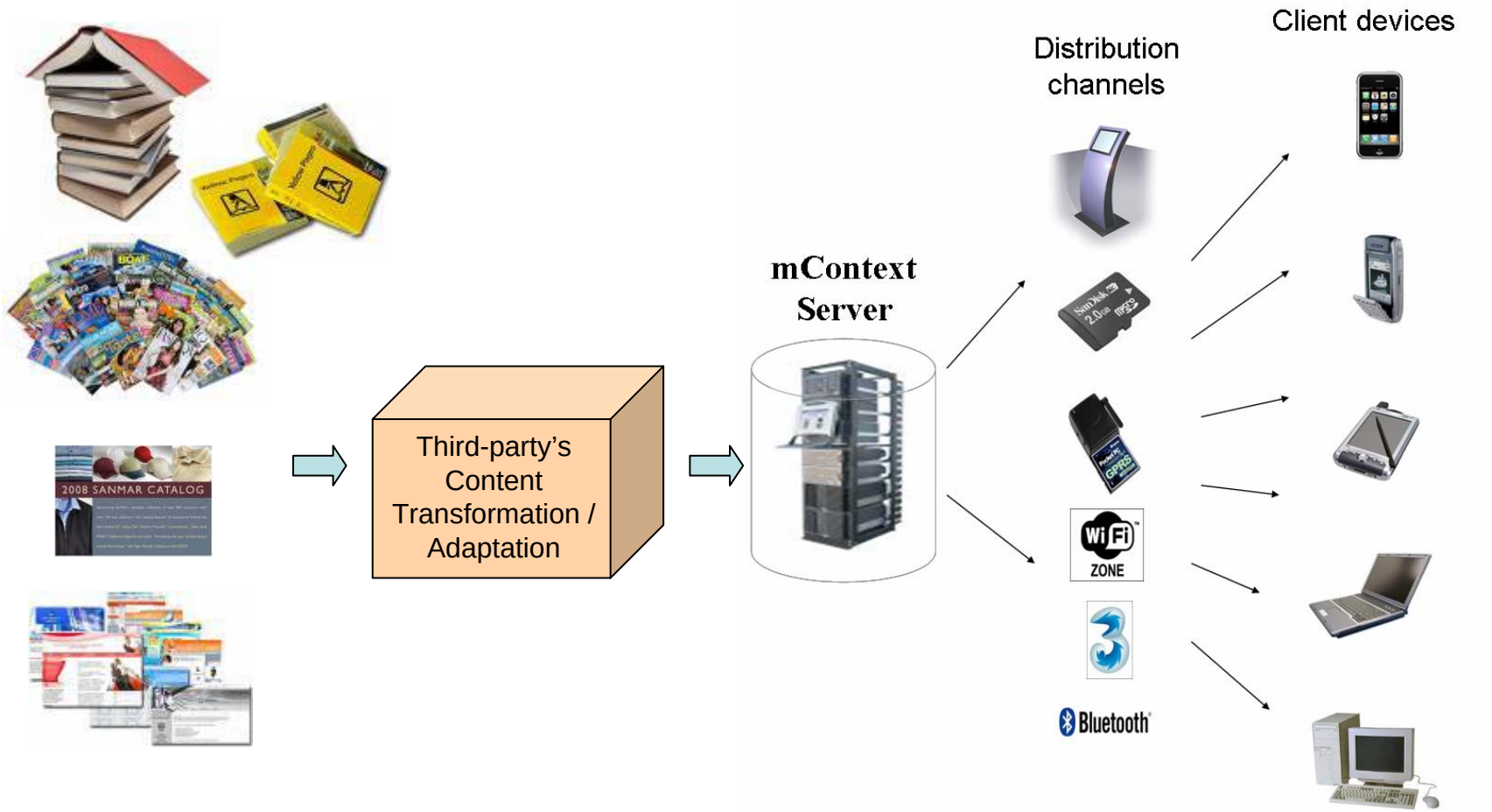
Node Navigation



Update Performance



Service Architecture

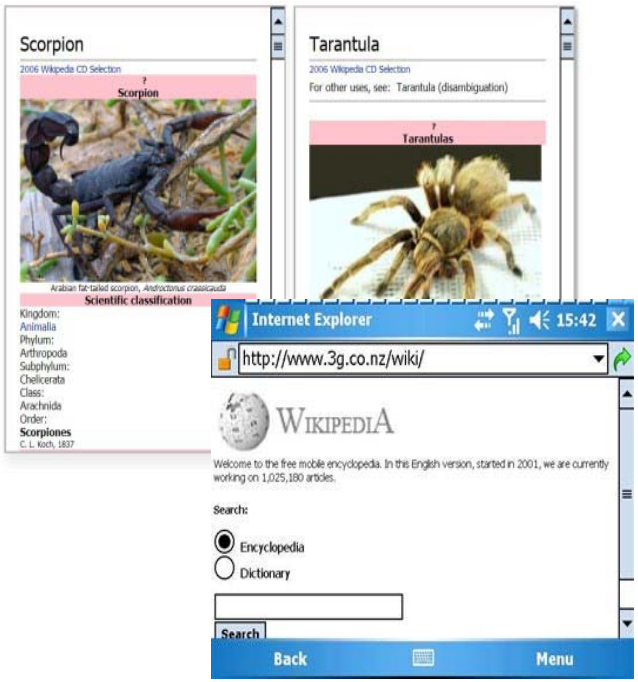


Examples

Wikipedia:

30GB (Text + Index) ⇒ 3.5GB

Over 4.5 million articles in English



Tradeshow Catalog:

CeBIT Australia, Macau Jewelry Show

Search, sync, image zoom, connect to exhibitor

Case Study: The Education Industry

Sync while connected; still have full access while disconnected.

More local content increases responsiveness & decreases demand for IT resources

Summary

- Challenges of deploying content-rich mobile applications
- mContext's benefits
  - Small storage footprint
  - Small runtime footprint
  - Fast and consistent performance on navigational access
  - Superior query performance (further indexing / query optimization can be added)
  - Superior update performance
- Applications
  - Publications (e.g., encyclopaedia , catalog)
  - The Education Industry

NICTA

From **imagination** to **impact**