International approaches to Smart Cities

Lean Doody,
Digital Cities Leader,
Arup.

ARUP

History of Smart Cities – from a technology focused vision, via generic "smart" to an outcome focused digital agenda.

2010 — 2011 — 2013 — 2014 — 2015 — 2016 —

ARUP

How are governments responding?

UK Government	Denmark Government	Bristol City Council	Liverpool City Council	Greater London Authority

Birmingham City Council	City of Edinburgh Council	Dublin City Council	City of Sydney	Canberra (Australian Capital Territory)

ARUP

GLOBAL REVIEW OF SMART CITY STRATEGIES

ARUP | CATAPULT Future Cities

The Smart City is not this.

It needs some of this.

- Better services and places
- Promotion and attracting investment

- Creating an equitable, inclusive city
- Citizen engagement and transparency

- Environment and sustainability

ARUP

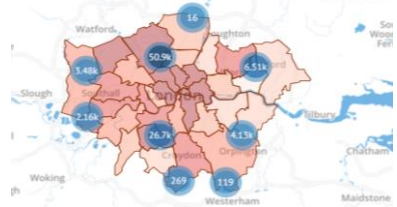# Better services and places.

Measured in:
Cost
Quality

More jobs.

Employment
Companies
Inward Investment

WATERFRONToronto

Tech Map LONDON

Companies	Latest turnover	Latest employees
94,284	£153bn	701,181
▼ -5% year on year		▲ 2% year on year

SMART CITY OPPORTUNITIES FOR LONDON

US$13.4bn

THE DIGITAL POWERHOUSE

WE ARE TECH NORTH

RSA

More Engagement.

Measured in:
Votes
Regular feedback
Trend data

BRICK STARTER   Start a project   Find a project   About this site   Join/Sign in

Make good things happen in your neighbourhood
1/ Start your project & build support 2/ Fund a project 3/ Volunteer your time 4/ Share your experience

Brickstarter is an open platform for community projects. You can use it to kickstart and coordinate your idea, get the community behind it, find professional help and advice, and gain financial backing from others.

The Stables — A co-working space, café, shop and community garden in what is currently a parking garage

Cloud City — A sustainable block and public space built on top of Merikortteli

Jätkäsaari windmill — A community-owned wind turbine on the tip of Jätkäsaari

Surveillance

British mobile phone users' movements 'could be sold for profit'

Hackers could steal users' location data, finding out 'where you are, how you got there and where you are going', say campaigners

Damien Gayle
@damiengayle

Monday 4 April 2016 08.19 BST

Mapeando   suggestions   Tell demands

HOW

- Vision and Leadership
- Organisation, Technology & Money
- Execution

Vision and leadership

	Most Cities	London Sydney Barcelona Amsterdam	Singapore New York San Francisco Scandinavian Cities	
Smart City Project Implementation	Level 1	Level 2	Level 3	Level 4
Soft Infrastructure				
Value Assessment	Individual project business cases	Some non-financial value assessed	Holistic value assessment (social/environmental/financial)	Holistic value assessment supporting diversification of funding sources
Governance	Departmental governance structures	Some cross-departmental collaboration	Cross-departmental 'Smart City' management positions in place	City-wide governance structures and shared performance targets combined with international collaboration
Strategic ICT Focus	Limited ICT capability	Some strategic focus on ICT	ICT vision for the city	ICT vision and strategy overseen by dedicated City CIO
Citizen Engagement with Service Design	Limited citizen engagement	Project-level, basic needs analysis, pilots	Citizen feedback loops established	Citizen participation in integrated service design
Hard Infrastructure				
IT project focus	Little or no ICT projects	Targeted ICT project investments (e.g. Smart Grid)	Integrated ICT investments (including embedded sensing, control and actuation)	Real-time city operations optimisation
Integration of Data Streams	No data integration	Small scale data integration	Creative data mash ups pulling data to a common platform	Open data and crowd-sourcing initiatives
Digital Service Provision	Little or no digital service provision	Handful of digital services	Integrated digital services around the city environment	Diversity of cloud-based citizen services

The City starts to understand its role across the ecosystem, not always as the provider of services.

Level 1   Level 2   Level 3   Level 4

Smart London Ecosystem

SMART LONDON PLAN

Using the creative power of new technologies to serve London and improve Londoners' lives

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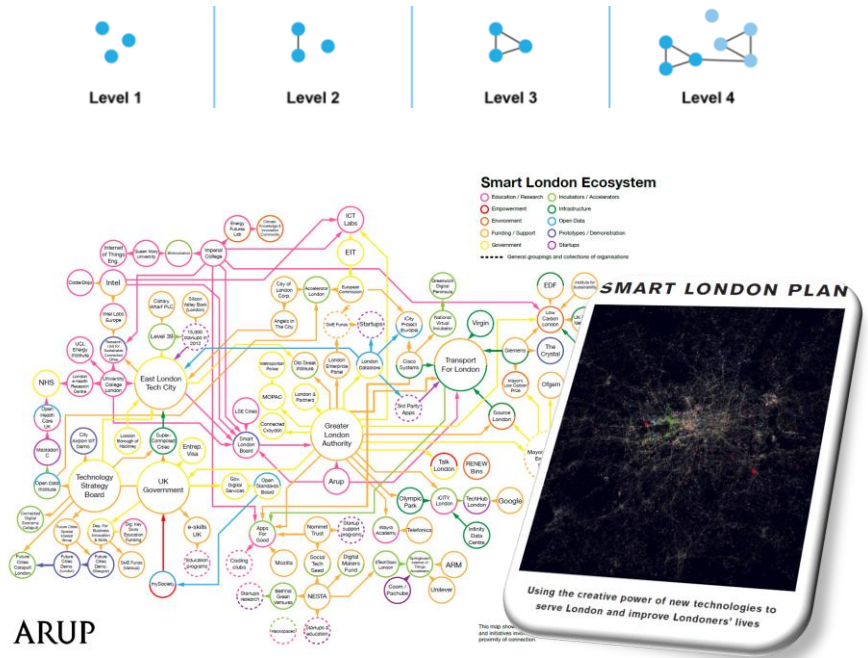
Technology is purchased by departments within its core requirements.

(and we need some silos = organisation)

Example technology

Level 1   Level 2   Level 3   Level 4

City Technology Spend

Back-office internal operations

Role of technology

Front-office public facing

| Health | Community services | Transport | Education | Business support | Regeneration | Council Administration |

Payroll software

GIS consultancy

Council website

Records management

Bus ticketing system

Online business rates payment

Level 1   Level 2   Level 3   Level 4

City Technology Spend

Technology is also being applied across departments and the cities ecosystem.

Example technology

Back-office internal operations

Role of technology

Front-office public facing

Health — Community services — Transport — Education — Business support — Regeneration — Council Administration
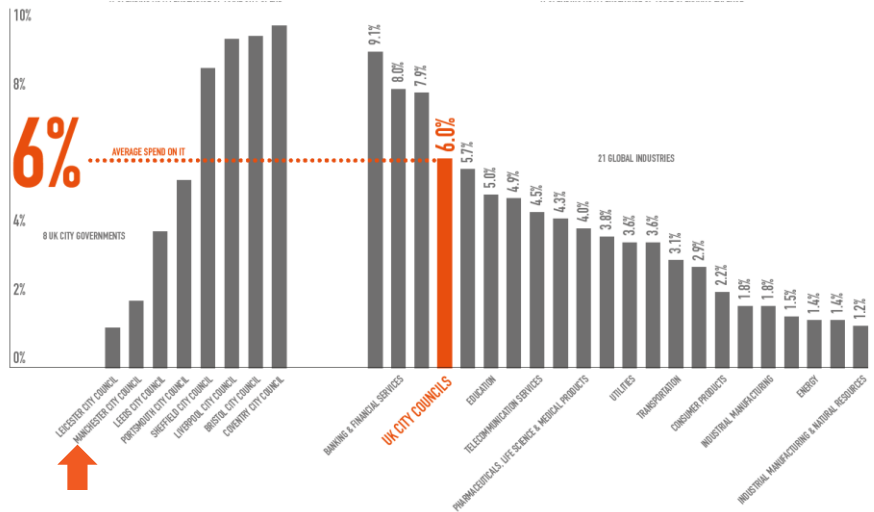
City data analytics

City data architecture

Smart parking
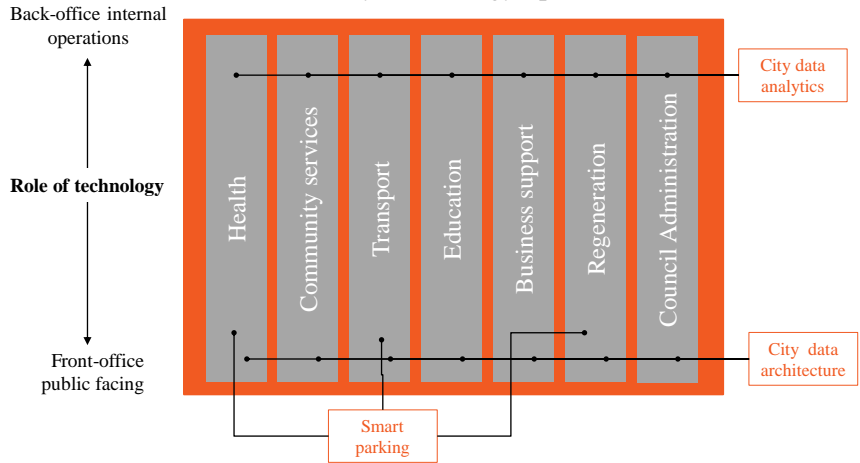
Money

IT Spending as a Percentage of Total City Spend

IT Spending as a Percentage of Total Operating Expense

6% AVERAGE SPEND ON IT

8 UK CITY GOVERNMENTS

21 GLOBAL INDUSTRIES

9.1% 8.0% 7.9% 6.0% 5.7% 5.0% 4.9% 4.5% 4.3% 4.0% 3.8% 3.6% 3.6% 3.1% 2.9% 2.2% 1.8% 1.8% 1.5% 1.4% 1.4% 1.2%

LEICESTER CITY COUNCIL, MANCHESTER CITY COUNCIL, LEEDS CITY COUNCIL, PORTSMOUTH CITY COUNCIL, SHEFFIELD CITY COUNCIL, LIVERPOOL CITY COUNCIL, BRISTOL CITY COUNCIL, COVENTRY CITY COUNCIL

BANKING & FINANCIAL SERVICES, UK CITY COUNCILS, EDUCATION, TELECOMMUNICATION SERVICES, PHARMACEUTICALS, LIFE SCIENCE & MEDICAL PRODUCTS, UTILITIES, TRANSPORTATION, CONSUMER PRODUCTS, INDUSTRIAL MANUFACTURING, ENERGY, INDUSTRIAL MANUFACTURING & NATURAL RESOURCES
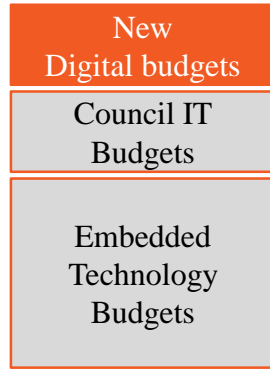
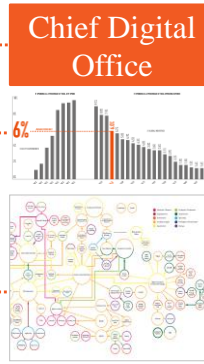Source: Arup & UCL (2014) Delivering the Smart City: Governance in the Digital Age

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Money

City Technology Spend

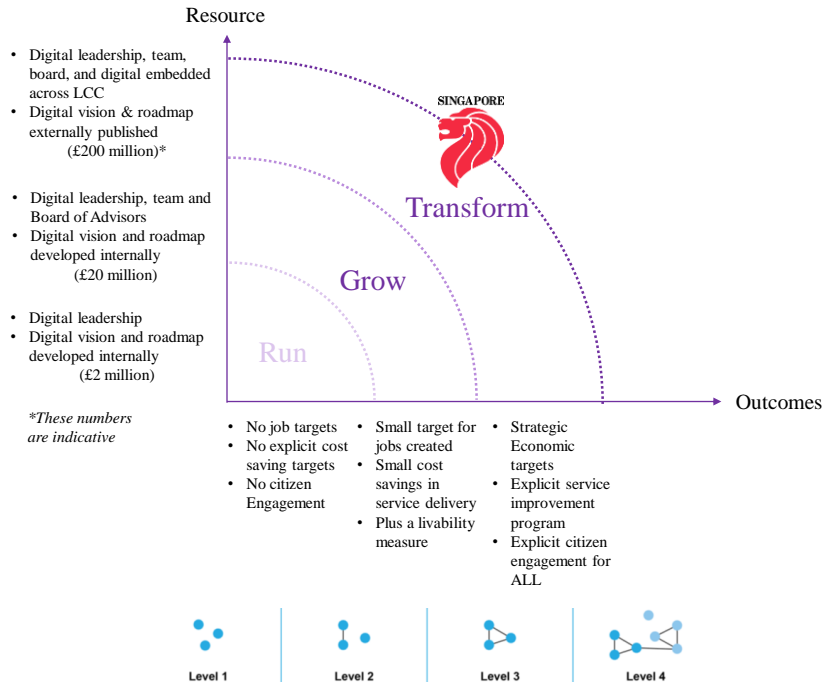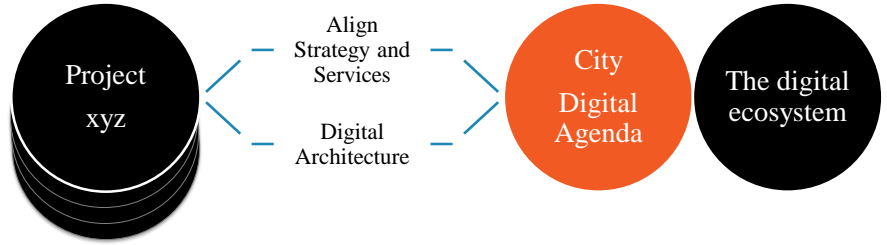City Ecosystem

Cross-city planning

New Digital budgets

Chief Digital Office

Council IT Budgets

6%

Embedded Technology Budgets
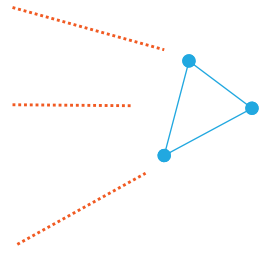
(perhaps similar to city planning systems)

Level of Ambition

Resource

- Digital leadership, team, board, and digital embedded across LCC
- Digital vision & roadmap externally published (£200 million)*

- Digital leadership, team and Board of Advisors
- Digital vision and roadmap developed internally (£20 million)

- Digital leadership
- Digital vision and roadmap developed internally (£2 million)

These numbers are indicative

SINGAPORE

Transform

Grow

Run

Outcomes

- No job targets
- No explicit cost saving targets
- No citizen Engagement

- Small target for jobs created
- Small cost savings in service delivery
- Plus a livability measure

- Strategic Economic targets
- Explicit service improvement program
- Explicit citizen engagement for ALL

Level 1   Level 2   Level 3   Level 4

City Vision and Strategy

Project xyz

Align Strategy and Services
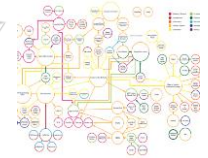
Digital Architecture

City Digital Agenda

The digital ecosystem

Digital Masterplan(s)
Incl digital & data
architecture

Digital Agenda

Facilitated Ecosystem
Incl digital & data
architecture

Have a plan.

ARUP

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