Century-of-Information Strategy

JCSR, JISC London

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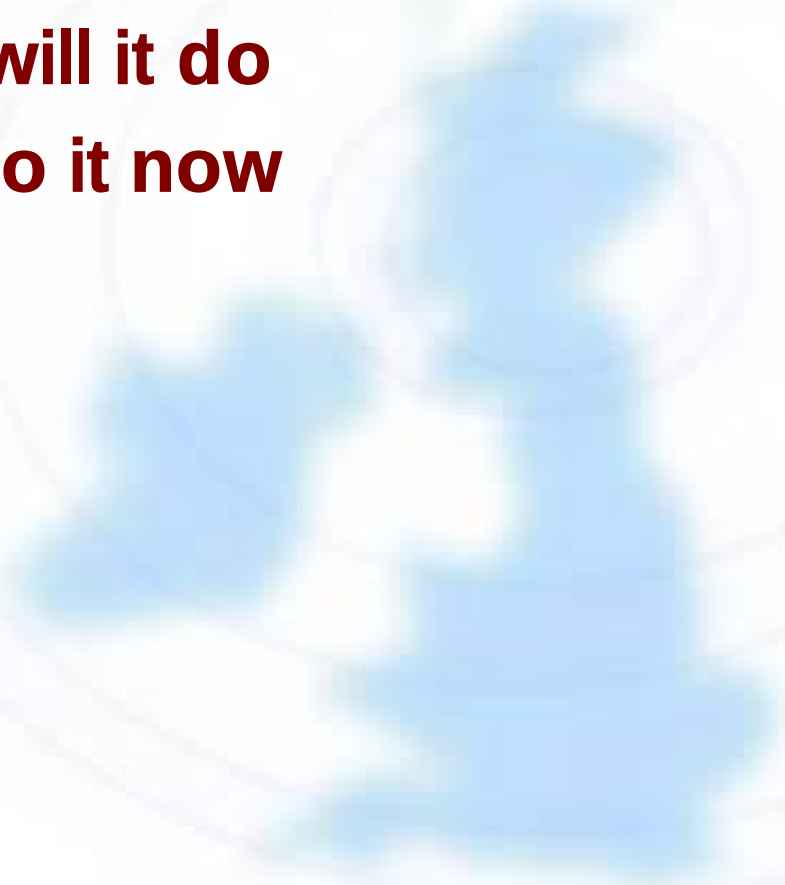
Outline

- Why we need a CIR Strategy
- What will it do
- Why do it now



Official UK Research Goals

	Research Council Priority	AHRC	BBSRC	EPSRC	ESRC	MRC	NERC	STFC
	Strategic Research							
CC	Digital Economy	✓		✓	✓	✓		✓
CC	Global Threats to Security	✓	✓	✓	✓	✓	✓	✓
CC	Living with Environmental Change	✓	✓	✓	✓	✓	✓	✓
CC	Ageing:Lifelong Health and Well-Being	✓	✓	✓	✓	✓	✓	✓
CC	Energy		✓	✓	✓	✓	✓	✓
CC	Nanotechnology/Nanoscience		✓	✓	✓	✓	✓	✓
	Stimulating innovation in the knowledge economy	✓						
	Capitalising on the UK's cultural assets	✓						
	Systems biology		✓					
	Tools & Resources, Data sharing, Bioresources		✓					
	Synthetic biology		✓					
	Post-Cooksey review: MRC/BBSRC interface		✓					
	Stem cells		✓					
	NC3Rs: animal welfare		✓					
	Succeeding in the Global Economy				✓			
	Migration and Population Change				✓			
	Understanding Individual Behaviour				✓			
	Discovery research and exploratory development					✓		
	Regenerative medicine and stem cells					✓		
	Methodology					✓		
	Evaluation and clinical trials					✓		
	Public health and population science					✓		
	e-Health					✓		
	Climate system						✓	
	Biodiversity						✓	
	Sustainable use of natural resources						✓	
	Earth system science						✓	
	Natural hazards						✓	
	Environment, pollution and human health						✓	
	Technologies						✓	
	Particle physics							✓
	Nuclear physics							✓
	Particle astrophysics							✓
	Astronomy							✓
	Space exploration							✓
	Light sources							✓

Table from Anna Kenway

The 21st Century

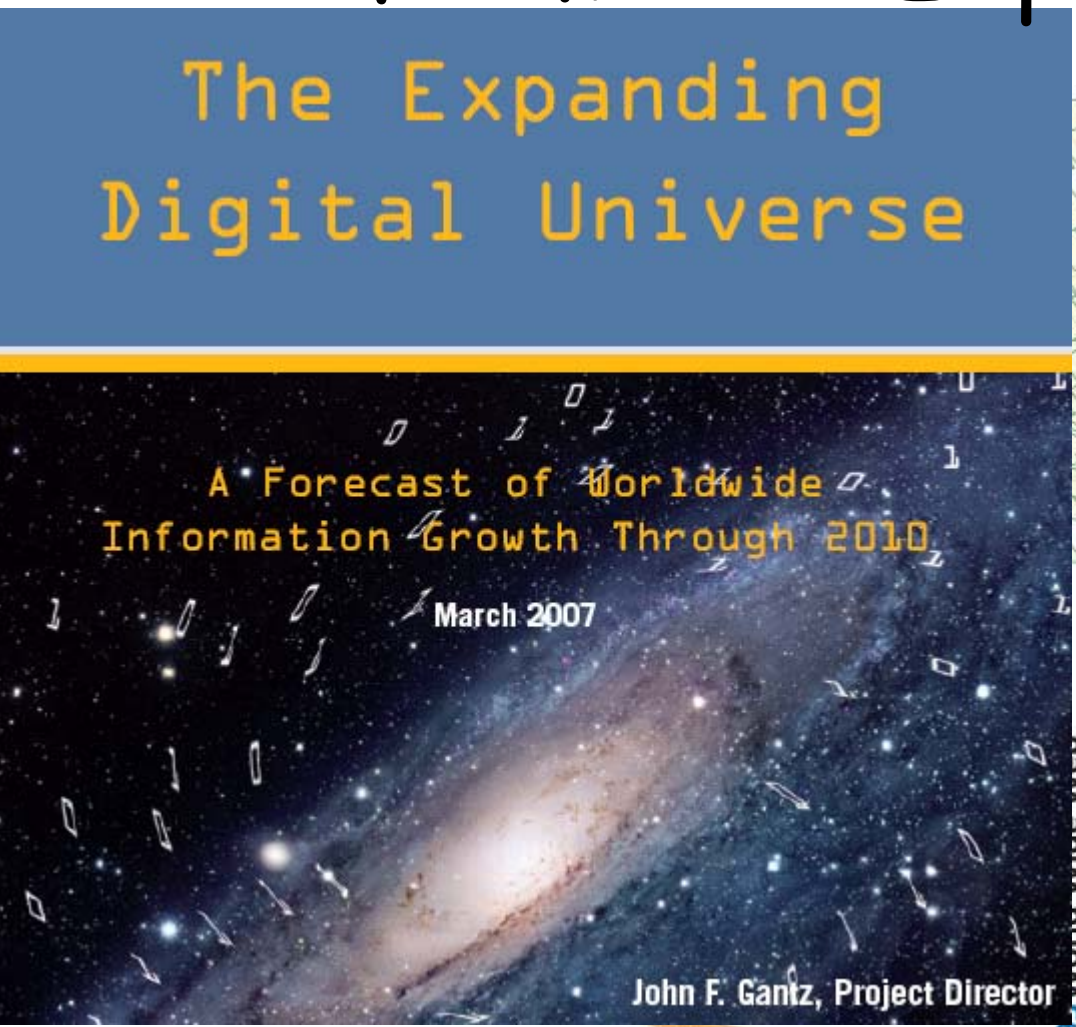
This is the century of information

PM G. Brown, University of Westminster, 25 October 2007

- We can collect it
- We can generate it
- Can we move it?
- We can store it
- **Can we use it?**

- Dramatic increase in data from sensors
- Dramatic drop in cost of computation
- Web-scale effects
- Ubiquitous digital communications
- Community intelligence
- Global challenges
- Transforming research, design, diagnosis, social behaviour, …

The Information Explosion



988EB = 1ZB
(2010)

161EB
(2006 by IDC)

Slide: Satoshi Matsuoka

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High-Level Goals for CIR

- **New world-leading research in all disciplines**
  - **New methods & new technology**
- **High impact (transformative)**
  - **Sustained rapid transfer from invention to wide use**
  - **Much wider engagement => More Research & Innovation**
  - **Capacity & Skills building**
  - **Innovative advances in Education**
  - **Effective transfer between business & academia**
- **Cost effective**
  - **Shared e-Infrastructure**
  - **Shared support for developing advances in**
    - Tools
    - Services
    - Trust
  - **Skills mobility & interdisciplinary R&D facilitation**

Elements of CIR

- Establish an Office of Strategic Coordination of Century-of-Information Research (OSCCIR)
- Support the continuous innovation of research methods
- Provide easily used, pervasive and sustained e-Infrastructure for all research
- Enlarge the productive research community who exploit the new methods fluently
- Generate capacity, propagate knowledge and develop a culture via new curricula

OSCCIR Goals

- Quinquenial planning cycle
- Balance cost-effective e-Infrastructure with enabling best research
- Encourage development of skills in information & computationally intensive research
- Ensure that achievement in interdisciplinary & information intensive research is well valued
- Enable diversity, agility and creativity on increasingly powerful e-Infrastructure
- Harmonise provision and increase interoperability
- Monitor provision and ensure cost effective
- Conduct strategic reviews to assess UK CIR in the global context
- Improve quality and sustainability of services and tools
- Improve pathways for exploitation
- Promote public understanding of CIR
- Consult on ethics

Enable Rapid Innovation

- Sustain support for interdisciplinary teams
  - Breakthroughs depend on talented research leaders
  - Plus strong supporting teams
  - Plus fundamental advances in all disciplines and technology
- Provide an environment of composable components
  - Significant advances from familiar components
  - Composed in new ways
- Provide powerful tools and services
  - With licence to experiment
- Inject energy through challenges & long-term funds

Enlarging the community

- Multiple levels of attainment and curricula
- Shared training material
- Joint action with professional bodies
- Opportunities for developing skills
- Recognition of skills
- Communication about opportunities & benefits
- Work with industry
- Flagship examples & media outreach
- Messages through media, museums and schools

Education for CIR

- Research council Doctoral training accounts
- HE FCs and RCs develop incentives
- Organise flow from grant-funded research to education
- Workshops on educational goals and the means of achieving them
- Eventually deliver input into schools curricula

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Changing Context for Research

- Growing proportion is collaborative effort
- International challenges, facilities & collaboration / competition
- Digital-systems revolution
  - Automation, sensors, instruments, computers, data & networks
  - Pervasive use of digital devices and data
  - Data deluge
- Shared remote experimental facilities
  - Real-time control and analysis
- Ambient computational and content services
  - Community expectations, collaborations & intelligence
  - Public engagement in ethics, green energy, decisions & policy
- In all professions information systems, data analysis and computational modelling will become prevalent

Dangers from Inaction

- Loss of competitive position
  - Less agile innovation
  - Fewer collaborating communities
  - Less interdisciplinary and community effects
- Poor return on investment
  - Sharing lost, effort duplicated
  - Community fragmentation, aggregation harder
  - Loss of skill mobility
- Lack of expansion of the active community
- Loss of international influence & opportunities

Questions

Photographer: Kathy Humphry

OSCCIR Stakeholders

- General public
- Researchers
- Educators
- Institutions
  - Universities, Research Centres
  - Commercial Information Systems R&D
- Users
  - Business, government, education, healthcare & organisations
- Funders
  - DIUS, research councils, funding councils, research-funding charities & TSB