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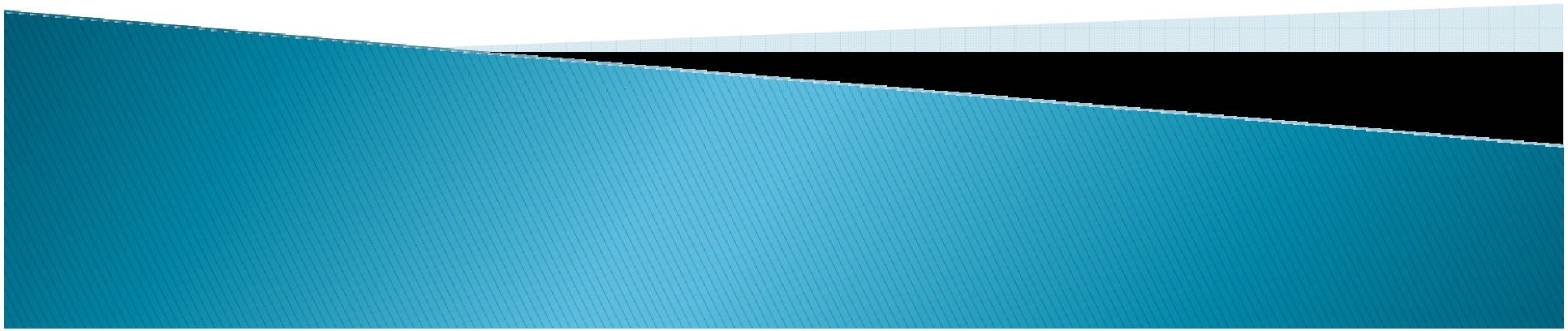
FUTURE INTERNET ASSEMBLY

Towards a roadmap for Future Internet Research

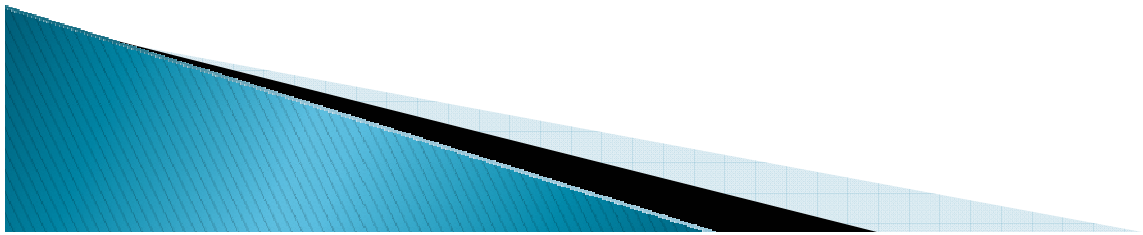
Nick Wainwright
HP Labs / Effectsplus project



Towards a roadmap for Future Internet Research

The report of a consultation of the Future Internet Assembly – a cross disciplinary assembly of researchers – on the research priorities for Future Internet Research in Framework 8

Consultation carried out by the FIA Research Roadmap Working Group under the Effectsplus (www.effectsplus.eu) and supported by Future Internet Support action projects http://fisa.future-internet.eu



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Research having impact in the Framework 8 timeframe, at the start of the next decade and beyond ….

… which will take place in a context vastly different from that which prevailed at the start of the current framework programme.

Future Internet Assembly Research Roadmap

- Taking a cross-disciplinary approach
- Positioning our vision in a Future Internet world
- Identifying challenges and gaps
- Highlighting research priorities

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The landscape for impact 2020+

- Generational shift in attitudes to Internet
- A networked society and economy
- Smarter cities
- Faster networks
- Sophisticated devices
- High definition experiences
- Massive data
- Emerging technologies
- Resource constrained workd
- Global competition in innovatiotion
- Huge demographic changes
- Not equal access for all
- Congested networks
- Infrastructure costs
- Digital rights
- Cyber conflicts
- Internet restrictions

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The Internet research community has a strong vision for the future

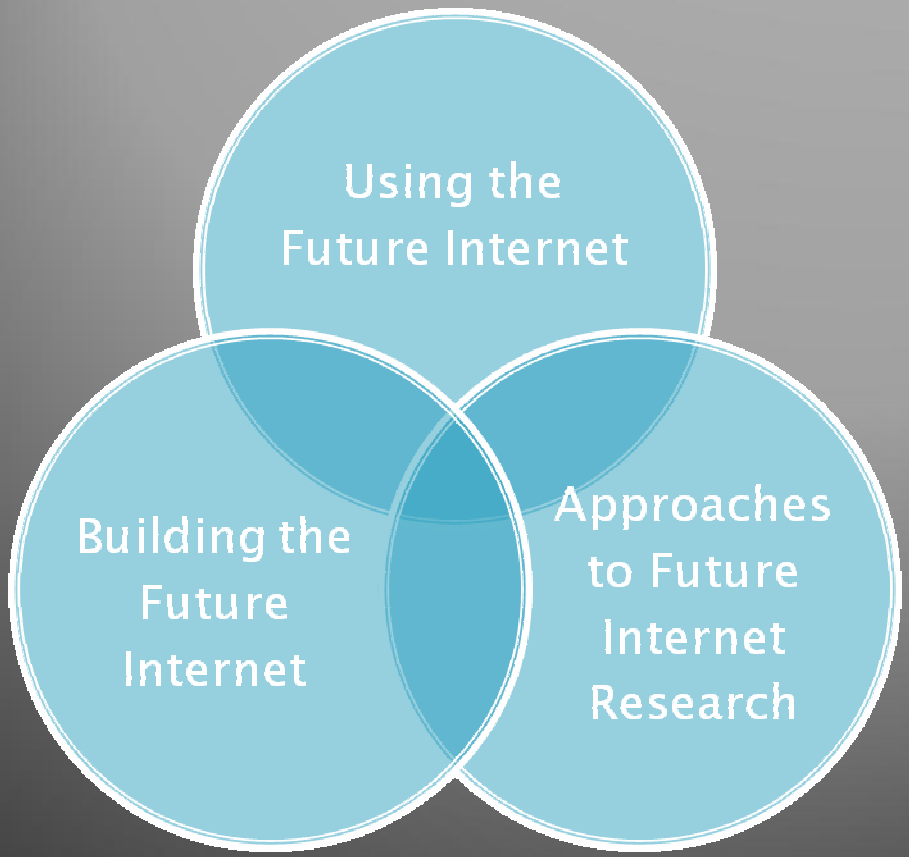
- Knowledge-rich collaborative networked innovation
- Flexible, networked enterprises
- Cities filled with rich, connected services,
- Citizens, SME's, industry, public sector empowered to innovate
- Internet deeply embedded in all sectors of the economy
- People empowered to control networked personal data, but also free to exploit and benefit from it
- An inclusive Future Internet with no barriers to access

Future Internet Innovation

- Rich experiences enabled by 3D, data, and displays
- Rich in exploitable knowledge and data
- Reliable enough to support critical infrastructures
- Secure for users, business, and service operators
- Able to meet huge increase in demand
- Supporting complex smart apps
- Enhancing activities in life and work
- Predicable and manageable

Future Internet Technology

Future Internet Assembly Research Roadmap Challenges and Research Priorities



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1. Beyond Converged Infrastructure

- Demand grows and changes
  - Huge demands on capacity,
  - New complex traffic from smart apps and devices
  - Services/ infrastructure boundaries blurring
  - Even smarter devices at the edges of networks
- Beyond converged infrastructure towards an execution environment for services
  - Polymorphic networks
  - Expanding the cloud
  - Smart systems at the edges

2. Exploiting Networked Data – The Internet's natural resource

- **No end to the growth in Networked data in sight**
  - More sources, applications, sectors
  - More valuable, sensitive, personal, analysed
  - More types, apps, and services
  - More connected, linked, distributed
- **The Future Internet will need a sophisticated and comprehensive approach to data**
  - Hosting huge, comprehensive, connectable data resources in everything from data factories to devices
  - About spaces, places, people, media, experiences, behaviours and knowledge, and more
  - Providing sound data governance, blending rights, obligations and control at fine granularity
  - Enabling services to use massive data in real time distributed, streaming, fast, and accountable

3. Securing the Future Internet – Infrastructures, applications, data, users

- A complex technical-socio-economic system
  - More targets to attack
  - Increasing sophistication and scale of threats
  - Greater potential rewards
  - More serious consequences
- Securing it is challenging
  - Understanding risks, costs, business impact
  - Making the user part of the system of security
  - Providing differentiated security levels
  - Detection, Metrics and Countermeasures
  - Robust system architectures

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4. Networked Interaction – People, data, content, spaces, --

- An abundance of need
  - Industrial and enterprise, collaboration, visualisation,
  - Health, inclusion, education, creative, buildings, and more
- A plethora of capabilities:
  - Multidimensional, wall sized displays, smart devices, situated systems, haptics, sensing, and more
- Complex technical, systems, social, and user challenges

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4. Augmenting worlds – Making the Internet work for us

- Internet of things + Internet of services = Internet doing things

- Integrating internet technologies and systems to support complex future industry, environmental, and societal challenges

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6. Internet-style innovation – Future and Emerging Applications and Services

- Exploiting network scale
- Building working systems, working code,
- Using Infrastructures that are open to innovation
- Enabling Innovation at the boundaries between sectors
- Engaging SMEs and start-ups
- Using cities as testbeds

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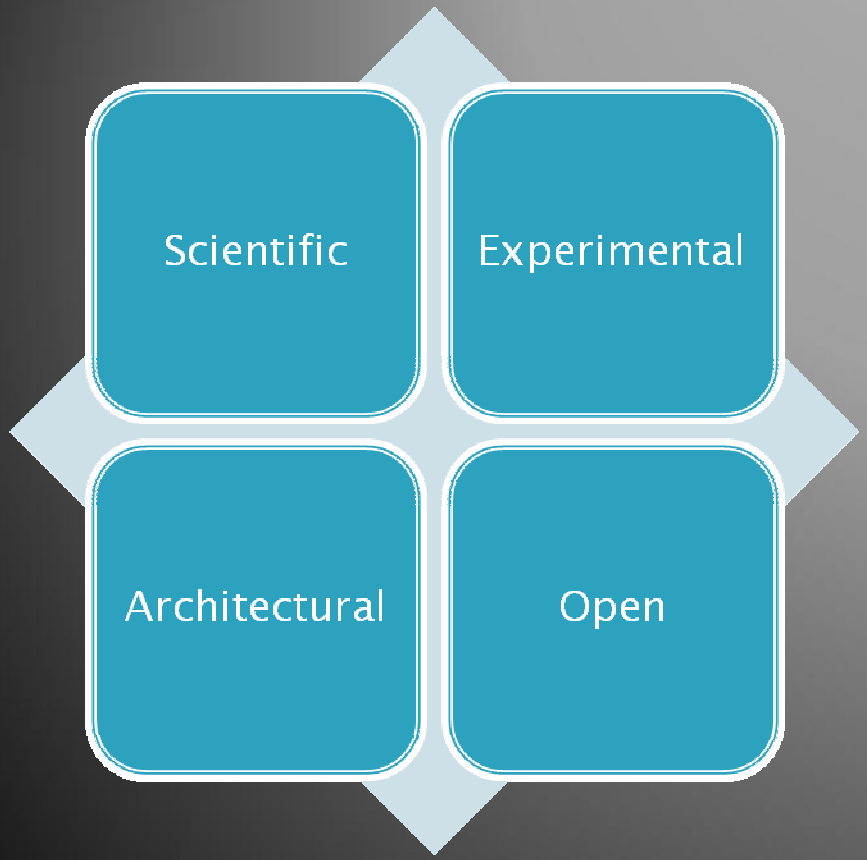
Fundamental Approaches to Future Internet Research



- Quantitative approaches at every level, technical and socio-economic
- Experimentation and discovery at scale, building virtualised experimental facilities in the fabric
- Interoperable and scaleable through consistent architectural approaches
- Open, accessible for innovation, empowerment, and inclusion

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Future Internet Assembly Research Roadmap

Towards Framework 8: Research Priorities for the Future Internet