

FI PPP – Experimentation

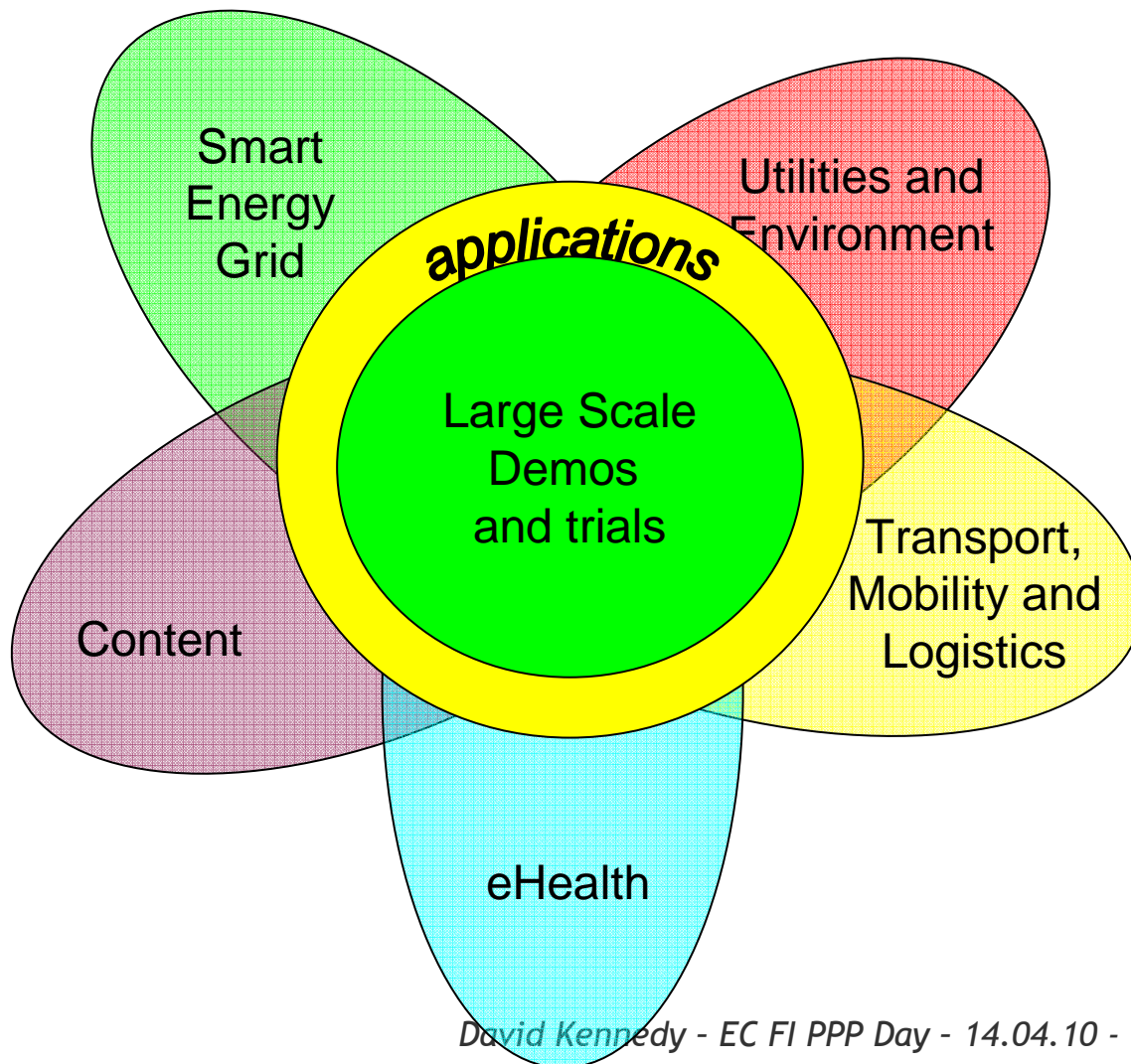
Potential FI PPP Use-Cases, Trials and Experimentation Scenarios

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30.06.10 - FIRE Week - Barcelona

FI PPP - Maximizing the Common Enablers

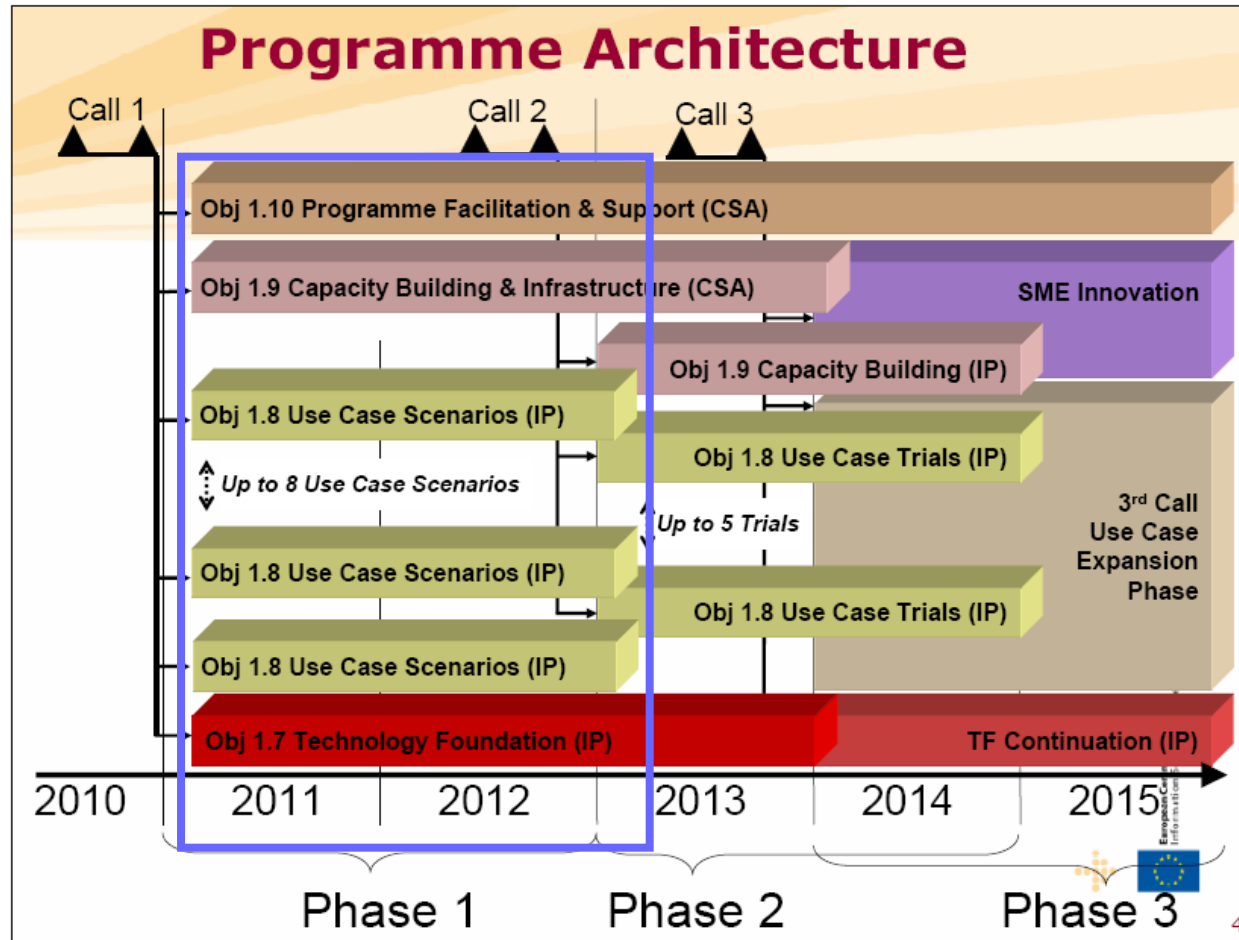


- Examine the basic enablers in each area
- Determine the common enablers
- Determine the enhanced enablers
- Work out how to provide a core platform that supports the enablers
- Build it and show the world
- Use it in large scale trials and tests
- Use existing advanced infrastructures to test future Internet function

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Programme & Projects – Global Overview (2/2)

FI PPP - Programme and Projects





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Experimentation - FI PPP Programme

FI PPP - Experimentation

- Experimentation in
 - Usage Areas Phase 2 (work) and Phase 1 (requirements / specification work)
 - Core Platform
 - Capacity Building and Infrastructure Phase 2 (work) and Phase 1 (requirements / specification work)
- Usage Areas Phase 2 projects are expected to define their experimentation approach, according to different envisaged axis (e.g. “classical prototyping”, Network of Operators, FIRE-like, pilots...)
 - (1) Experimentation objectives -> Black box approach. What is expected from the experimentation? What do we want to achieve, demonstrate, measure, quantify...?
 - (2) Experimentation requirements -> What are the already identified requirements in order to achieve the objectives?
 - (3) Experimentation means -> What are the already (pre-)identified means / facilities and potential locations for pilots or trials?
- Core Platform -> What will be prototyped?
- Capacity Building and Infrastructure Support focused on leveraging public investment
 - One of the key questions: What are the FIRE / GEANT / NRENs capabilities and service offers to be potentially considered and further developed?
 - One of the current basis for further development: G23 document (edited by Guillermo Cisneros (UPM)) “Validation issues, facilities and priorities in the PPP application areas”



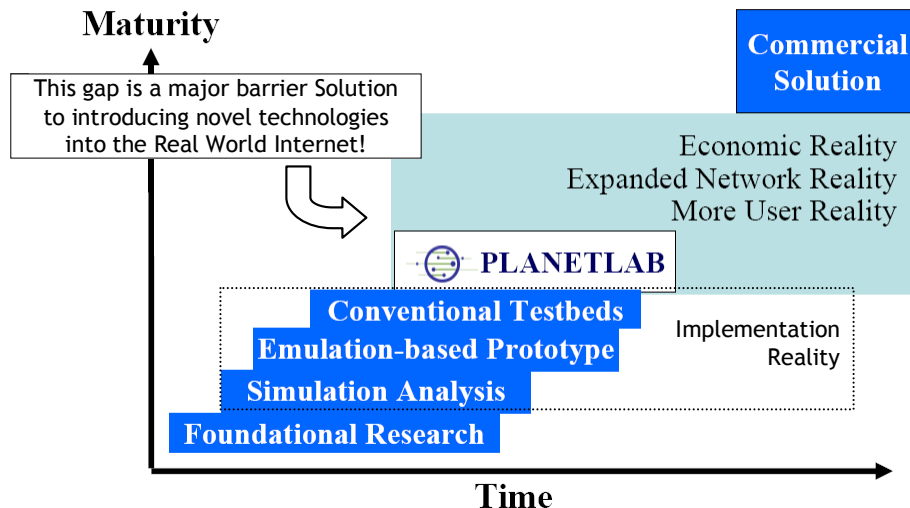
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Experimentation Approach - Didier Bourse – FIRE Lulea Week – July 09 (1/3)

Future Internet PPP - Prototyping and Validation

- FI PPP includes specific focus on prototyping, validation, piloting, trials
-> **Currently under definition**
- “Experimentation gap”

Much more to do to close the gap...



PlanetLab - Marc E. Fiuczynsk - Princeton University
FIRE Week - 10.09.08 - Paris
(Combination of Gap / Gap Decrease / More to do...)

**Analysis/discussions on what will be
experimented through
(different goals and methodologies)**

1. “Classical” prototyping
2. Trials on existing networks and “real” Internet (e.g. through NOs networks)
3. “FIRE” experimental facilities (e.g. FOT approach)
4. Pilots (e.g. in connection to Smart Cities)



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Experimentation Approach - Didier Bourse – FIRE Lulea Week – July 09 (2/3)

“ FIRE-like ” Experimentation - Facts (Highlights)

- **Derisk prototypes concepts/modules** that require trials in real-life conditions that can not be reproduced in confined environments
- **Access to hundred of machines physically distributed** across the world and available on public Internet **to host applications for testing in real-life environment**
 - Consider delays, latency, real-life network traffic, variable bandwidth, realistic robustness, large scale, failure modes...
- **Build by experiment distributed systems and network protocols**
- **Evaluate performance of infrastructures and services**
- **Validate mechanisms for interworking and verification of interoperability**
- **Experiment and co-create with real-users** and real-life environment. Important role of **User Driven Innovation (UDI)** in the context of FI
- **Note: “Natural” evolution** for experimentation, all applications evolving toward digital/virtual world (e.g. banking, commerce...)



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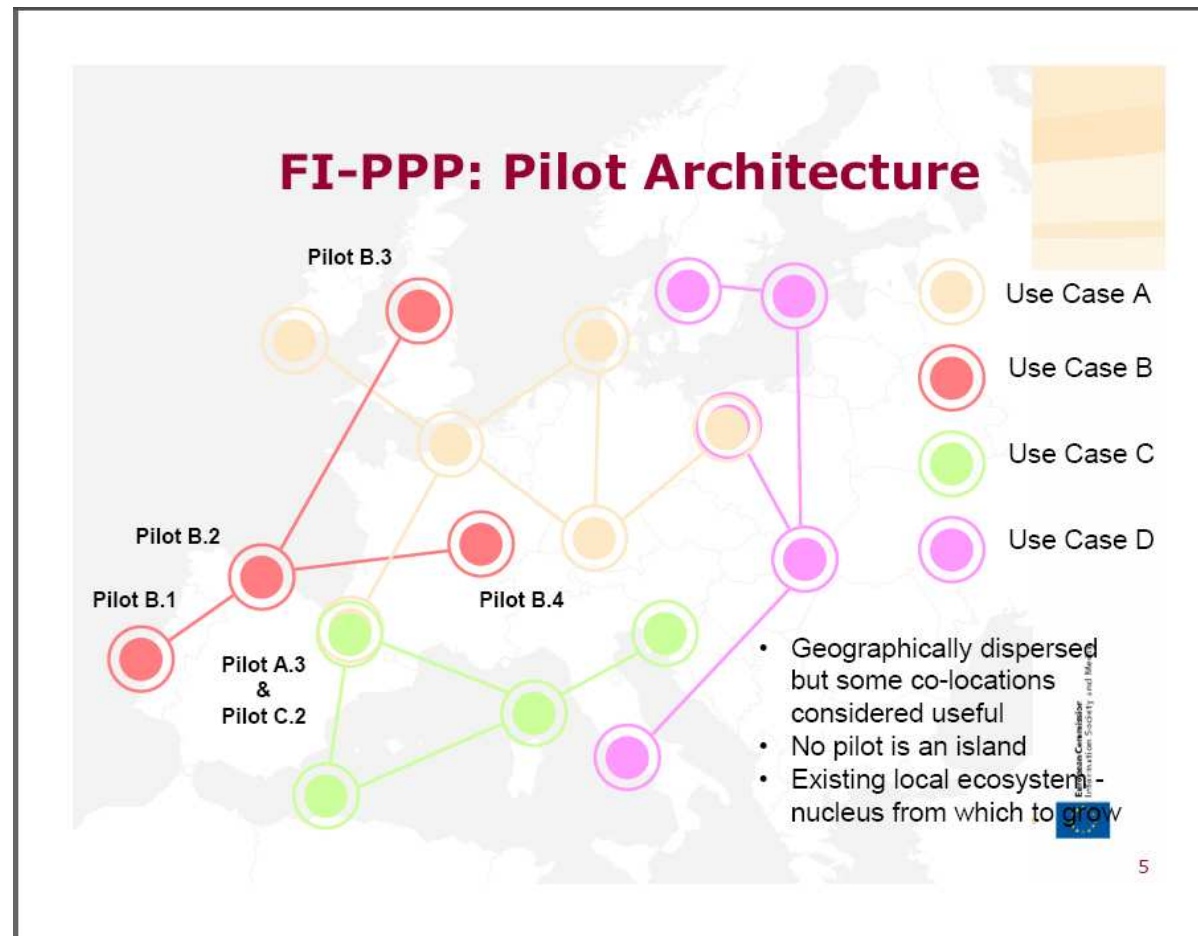
Experimentation Approach - Didier Bourse – FIRE Lulea Week – July 09 (3/3)

“ FIRE-like ” Experimentation - Open Questions (highlights)

- What is the **most appropriate FOT approach** in the context of **short-medium terms Industry impact**?
 - PlanetLab / PlanetLab Europe? OneLab2? G-Lab? / LivingLabs? European Network of LivingLabs (ENoLL)? / Federica? (VITAL++? Wisebed?) - GEANT? NREN? DANTE? TERENA? / PanLab2? / CoreLab? GENI Spiral1? / PPPLab?...
- Are these **experimentation facilities interoperable** (meta-level) or should the facilities be **considered as standalone** (one facility family per specific objective)?
- **What can Industry not test** on “FIRE-like” experimental facilities as compared to “real” Internet
- How can we take benefit from **EU and National pilots and testbeds**?
- What can be **leveraged from GEANT and DANTE**?
- Where is the **right balance** between **bottom-up** (availabilities) and **top-down** (use requirements) experimental facilities design/development
 - Who are the “**customers**”/users of the current experimental facilities?
 - Are the **FP7 projects** taking benefit of the experimental facilities?
- Is this possible to guarantee **reproducible and verifiable results** from experimentations?
- Is this **secure enough environment** for experimentations?
- What are/will be the **tangible industrial achievements/benefits** from the experimental facilities (e.g. from PII, OneLab2...)?
- ...

FI PPP Experimentation - Pilots

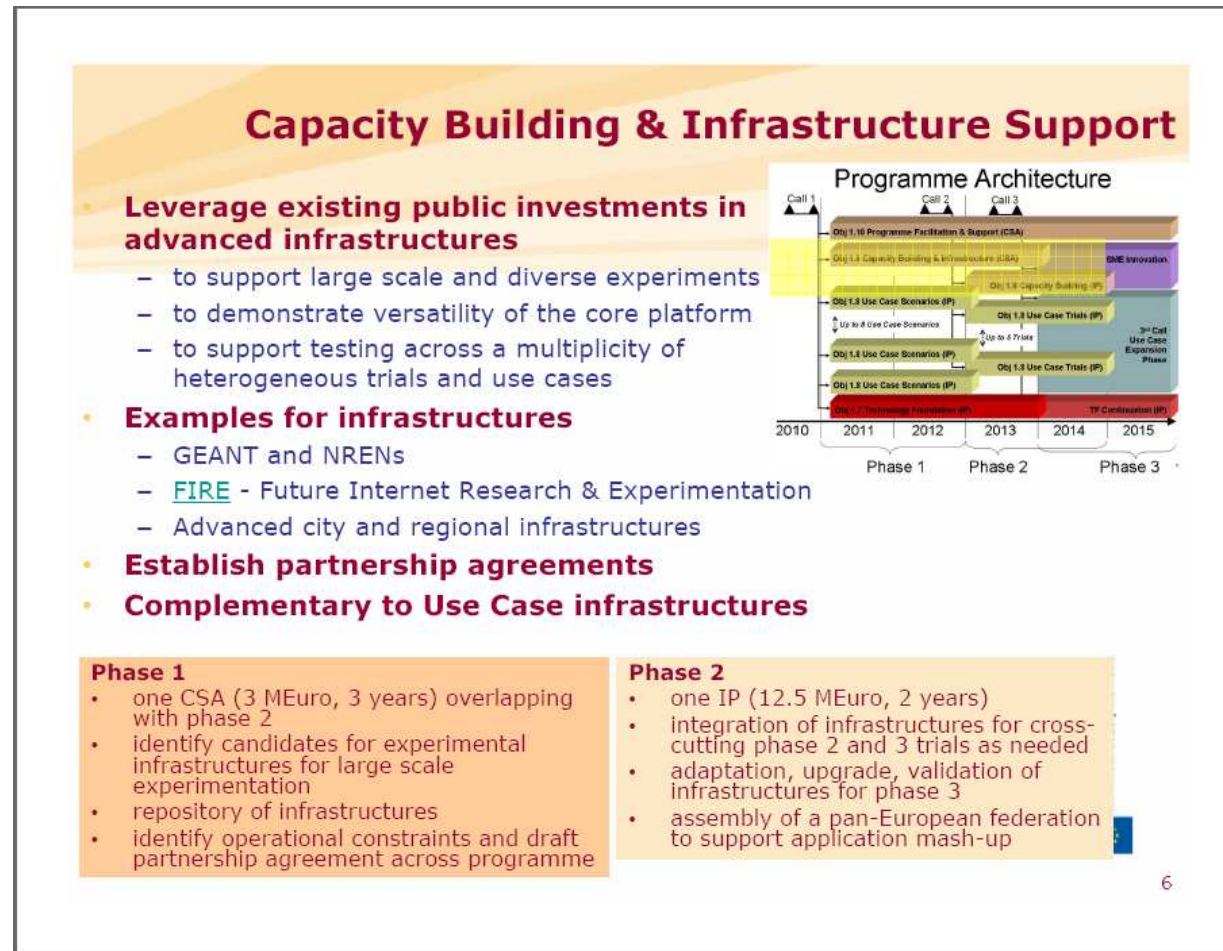
FI PPP - Pilots and Pan-EU Perspective



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Experimentation – Capacity Building and Infrastructure Support (CBIS)

FI PPP - CBIS Scope and Objectives





FI PPP Experimentation - Usage Areas Workshop – 21-22.06.10 – Brussels (1/4)

FI PPP - Usage Areas Workshop - Experimentation Perspectives

The screenshot shows the website for the European Future Internet Initiative (EFII). The header includes the EFII logo and the text "The EUROPEAN FUTURE INTERNET INITIATIVE". Navigation links include Home, EFII Organisation, Publications, Events (highlighted), News, and Contact. A breadcrumb trail reads "You are here: Events > 2nd Usage Area Workshop >". The main content area is titled "Towards a Future Internet Public Private Partnership" and "SECOND USAGE AREA WORKSHOP". It specifies the venue as "Hotel Husa President Park, Brussels, Belgium, 21 - 22 June 2010" and notes it is co-organised by the EX-FI Support Action and the European Commission. An "Objective" section states the workshop will build on the conclusions of the 1st FI-PPP Usage Area Workshop, held in March 2010, and will enable a broader discussion on the needs of the Usage areas and their requirements on the Future Internet. The workshop addresses the need to achieve an appropriate balance in the Future Internet Public-Private Partnership between provider "technology push" and user "application pull". A URL is provided: <http://initiative.future-internet.eu/events/2nd-usage-area-workshop>. A sidebar on the left lists "Events" with a tree structure: Architecture Workshop, 2nd Usage Area Workshop (selected), and Presentations and Position Papers for the 2nd FI Usage Area Workshop. The date and time "28.6.2010 : 10:41" are shown in the top right corner.

Q1: What use case and scenario in your area would you consider the most appropriate and representative one for **large-scale experimentation** with the Future Internet platform to be built starting from 2013 (please refer to the documents referred to on the above websites for inspiration)?

Q4: What kind of **experimentation environment** would you consider necessary for **broad large scale testing of the platform** to be developed in your use area? What would be needed to **experiment** new services and applications cutting across use areas (services and application mash-up) and building a new services and application ecosystem around the **prototype implementations of the platform**?



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Experimentation - Usage Areas Workshop – 21-22.06.10 – Brussels (2/4)

FI PPP - Usage Areas Workshop - Utilities & Environment (U&E)



Use cases and scenarios from the application perspective

- Use case categories:
 - Pure environment use cases: Air quality, noise, inland water, flood, forest fires, marine ecosystem, agricultural elements.
 - Pure utilities: Smart metering (electricity, water, gas), city automation (public lighting, waste management, ...).
 - Broader smart city use cases: Health, Transport, Tourism, e-Government, e-Education, m-Commerce, ...
- Key points
 - All PPP FI usage areas (but content?) present cross-cutting use cases for Utilities&Env usage area
 - Smart City: a large topic.
 - Environment and the city are closely related. (focus on Environment lead by Hugo De Groof, DG Env)
 - Several ecosystems are related: River basins, Regions, Marine, Agriculture, ...



Experimentation environments for large scale trials in phases 2 and 3

- An environment with several use cases. References: Assen, The Netherlands and Santander. Emphasis on the openness to various applications. Can not focus on a restrained set of applications in order to let new apps emerge.
 - ⇒ Mash-up between applications
- An environment with various actors involved for application pull. Some use cases involve existing sensors that only need interconnection. Interconnection may involve many players.
 - ⇒ Mash-up between actors on a same use case
- An environment adapted to the targeted use cases. For water management (if this is the use case), river basin can be the geographic target.
- An environment with multiple cities. Escalating effects.
- Re-use best practices
 - Living Lab approach to have the user at the center of the project.
 - Tourism: one event to test a system. A concrete use case? Is it worthwhile? Is it already addressed? 20000+ people involved in music festivals, one example. Take the lessons from concrete platforms. A concrete critical mass. Risky to bet on one event. Getting momentum rather on several places with long experiment duration.
- Phase 3: assess component generality with various use cases.
 - The Police case: a general model is applied for crime issues in Rotterdam Police slides. The created environment can be re-used for other use cases (fire, ...).
 - ⇒ cases may be addressed in phase 3 with systems developed in previous phases.

FI PPP - Usage Areas Workshop - Transport, Mobility and Logistic (TML)



Q1: Use case and scenarios for large-scale experimentations



- Three different potential use cases have emerged from the presentations:
 - Logistics
 - Traffic Management and cooperative systems
 - Personal mobility
- How to use results of previous FP(X) projects?
- Lots of technologies can be used
- We have to aim 2 different levels: intra-industry developments and end-users services
- Is it relevant to merge the 3 scenarios?



Q4: Experimental environments



- Prerequisite: active involvement of final users
- Definition of large scale pilots:
 - Large geographical area
 - Large number of users
 - Large number of devices
- Cities are essential for testbeds but are connected cities required?
- Availability of public information (data) and innovative networks
- Define criteria for "real experimentation"
- Cross-usage areas experimental environment could be relevant

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Experimentation - Usage Areas Workshop – 21-22.06.10 – Brussels (4/4)

FI PPP - Usage Areas Workshop - Alternative Usage Areas

EX-FI Session 6 Report (1/6)

Q1: What use case and scenario in your area would you consider the most appropriate and representative one for large-scale experimentation with the Future Internet platform to be built starting from 2013 (please refer to the documents referred to on the above websites for inspiration)?



- Tourism
- Networked Manufacturing: Virtual company concept - Connecting all actors in the supply chain – connection to FoF
- Food Production - Agri-Food (Healthy food from farm to fork)
- ICT for Environment (Water, Forest, Natural Resources) – connection to U&E?
- Quality of Life
 - Users & Internet / Digital Communities / (happy healthy) Ageing Population
 - Family and Social Networking
 - Education and Training
 - Entertainment – connection to “Content”?
 - Media and Culture – connection to “Tourism”?
- eGovernment – eParticipation, Public service provision, Modernization of the public sector
- Scientific developments e.g. LHC, radio astronomy, computational socio-geonomics...
- Smart Building – connection to EeB
- Finance
- Crisis Management

} incl. SMEs

EX-FI Session 6 Report (5/6)

Q4: What kind of experimentation environment would you consider necessary for broad large scale testing of the platform to be developed in your use area? What would be needed to experiment new services and applications cutting across use areas (services and application mash-up) and building a new services and application ecosystem around the prototype implementations of the platform?



- GEANT
- Smart Cities, e.g. Smart Barcelona (-> Smart Regions)
- Network of Smart Cities
 - Each of those making available a service platform and a device/object virtualization layer with common characteristics (service formats, brokering services, energy- and health- oriented ontology)
 - Plus a federated/hybrid public/private cloud-based data center facilities to host secure databases for real-time computing and historical storage
- Networked manufacturing pilot plant
- Experimentation environment must explore service offering across a range of user communities:
 - Remote communities with poor communications infrastructure
 - Smart Cities
 - Various legal frameworks
 - Local, regional, national and pan-European service offerings
 - Important to involve Social Science expertise in assessing user experience, socio-legal aspects, economic drivers/constraints, etc.



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FI PPP Programme – FIRE Week

FI PPP - FIRE Barcelona Week

- Further develop better mutual understanding and contribute to close the gap between FI PPP experimental perspectives and FIRE / GEANT / NRENs service offering
 - A dedicated task in our CSA