



# The EUROPEAN FUTURE INTERNET INITIATIVE

Preparing *es.internet* contribution

# The objective of this meeting. Opening the activities of the Fol

- Explain the activities of the CG in preparation of the next call on the Fol
- See where the Spanish firms could contribute



# Objectives

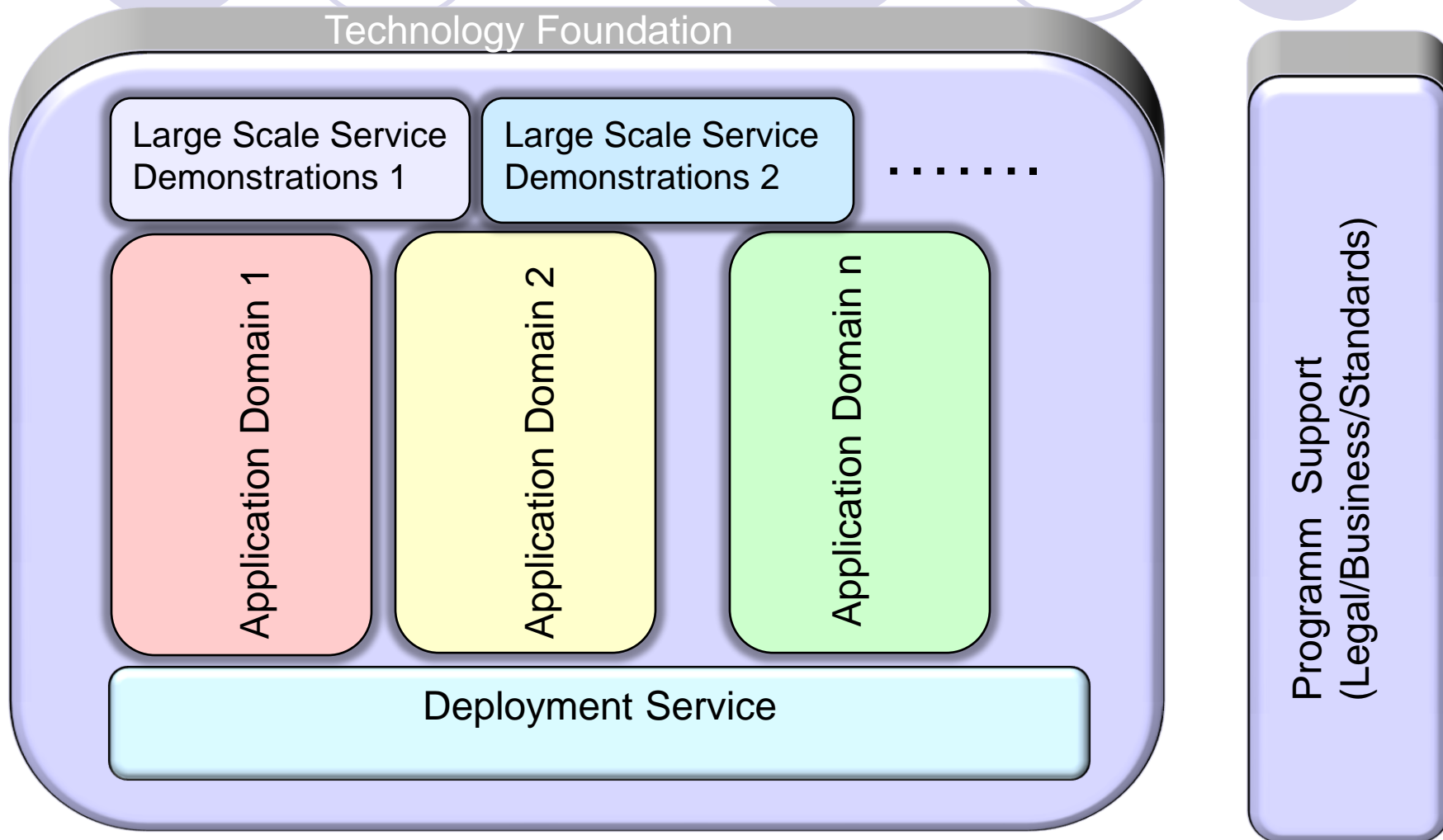
- The main objective of this initiative is to significantly advance the implementation and uptake of internet technologies in the basic function, process and infrastructure of **Smart Europe** regarding health, mobility, environment monitoring, energy and information management.



# Cross Sector and Sustainable

- Stand alone solutions developed in any one sector, will not provide the efficiency and productivity gains that a networked solution will be able to provide and that the market can support.
- A multidisciplinary and integrated approach, where massively distributed services and applications are run over large scale and secure internet infrastructures is the only means to deal with the increasing complexity of intertwined application and service demands.
- Only strong coordinated and decisive action can enable the establishment of such a multidisciplinary and integrated approach at the European level.

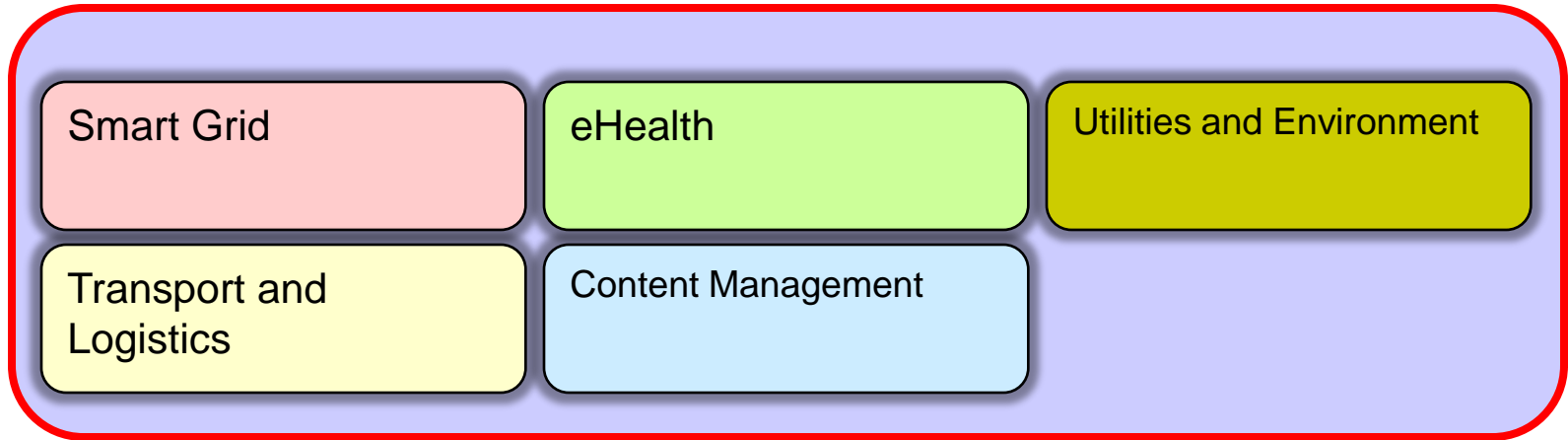
# Approach – Structure of the Development





# Application Domains

# Selected Application Domains (I)



# Selected Application Domains (II)

## Smart Grid

the power grid of the future will be characterized by decentralized energy generation and storage as well as by a bidirectional flow of the energy. This power grid of the future together with its control through a communication network (Future Internet) is commonly understood as the “Smart Energy Grid”.

## eHealth

four goals:

- a) facilitate large scale ubiquitous service delivery - enhancing citizen mobility
- b) enhancing the quality of healthcare service –
- c) more participative healthcare services - empowering patients to take part in the healthcare loop, including patient’s self-assessment, monitoring and acquisition of data,
- d) dramatically enhance daily life for elderly people and chronically ill patients.

## Utilities and Environment

ICT Systems and applications to facilitate and optimize the management of environment and utilities (light, cleaning, waste,...) to reduce carbon footprint and energy bills.

# Selected Application Domains (III)

Transport and Logistics

Content Management

ICT Systems and applications to facilitate and optimize

- the car circulation in cities
- the daily mobility of people (inter-modality , auto-lib, velo-lib,..)
- the transport of goods

ease the exchange and the distribution of digital content.

what is missing is this unified interface between hardware (network) and applications (services) This new interface that will be designed for the FI will form a playground for the fast development of new services, applications

# Smart Grids...

## Emerging societal problems

- Scarcity and increasing cost of fossil fuels
- Impact of the electricity production and consumption on climate change and global warming
- Introduction of distributed renewable energy resources in centralized legacy infrastructure
- No guarantee of supply due to deficient interconnection infrastructures (islands).

## Challenges to solve the problems

- Connecting a huge number of very dynamic participants (producers and consumers)
- Design of efficient forecasting systems to optimize energy generation, distribution and consumption
- Synchronization of the energy distribution network, protection against blackouts
- Efficient control of mobile energy storage
- Intelligent demand-side and load management, as well as smart metering
- Cost optimized operation of power and communication networks, energy efficiency by self-optimizing networks

## Technical requirements and technologies

- Economic connections of households metering infrastructure
- Extremely scalable, flexible, reliable and deterministic communication technologies
- Robust, dynamic wireless mesh networks
- Machine to machine communications
- Secure, dynamic and ubiquitous authentication
- Anonymity of data, privacy
- Unified and standard billing
- Data fusion and aggregation from thousands of billions of devices, sensors

# Transport and Logistics...

## Emerging societal problems

- Congestion of road and cities
- Pressure over fuel price
- Increasing CO2 emissions, pollution in cities
- Significant levels of death and injury due to road accidents
- Higher costs of moving goods
- Inefficient infrastructure for logistics

## Challenges to solve the problems

- Design of intelligent, adaptive, context aware and self-healing transport systems
- Monitor and manage transportation networks to get a better distribution. Gathering and distribution of reliable, real-time traffic information.
- Optimal coordination of the totality of transport modes
- Intelligent fleet monitoring and management
- Avoid congestions and bottlenecks in logistics
- Increase efficiency and reduce cost of transporting goods
- Better identification of goods

## Technical requirements and technologies

- Design of communication methods for V2V and V2I.
- Management of large amount of data about traffic conditions (data mining)
- Machine to Machine communications
- Data fusion and aggregation from thousands of billions of devices, sensors in roads, parking areas, streets
- New charging and payment systems
- Geolocalization
- Data mining
- RFid - Identification



# eHealth ...

## Emerging societal problems

- Population ageing and the increase of chronic patients across Europe
- Increase of health expenditure

## Challenges to solve the problems

- Interoperability of computer-based medical systems.
- Management and interoperability of electronic patient records and other health information systems
- Remote Interconnection of hospitals and medical teams
- Extreme guarantee of privacy and confidentiality of data
- Enhancement in remote care of patients (homecare) ( specially for chronic patients).

## Technical requirements and technologies

- Application of semantic in medical information
- Interoperability of health information systems (both standards and semantic)
- High definition images for diagnosis (3D)
- Machine to Machine communications. Use of sensors for remote monitoring
- High capacity and reliable networks to transfer a huge amount of medical data (images) between different locations.



# Content Management...

## Emerging societal problems

- Proliferation of any kind of multimedia content either created by professionals or even for user (prosumers).
- Demand of users to have contents everywhere, in any terminal to be displayed, shared with other people etc.

## Challenges to solve the problems

- Creating a network capable to transfer, storage and adapt contents of many formats, as well as developing tools to easily create, manipulate, search and retrieve any kind of media content..
- Handling of much more rich and complex formats than ever, including combination of traditional types of media, emerging 3D formats with higher definition, usage of metadata along with the raw data.
- Support to consumers in searching contents that are better adapted to their circumstances and preferences

## Technical requirements and technologies

- Multimedia search engines
- Recommendation systems
- High definition 3D image technologies
- Right managements
- Context awareness mechanisms to detect user's preferences and personalization
- New ways of coding, transcoding and manipulating contents
- Geolocalization
- New charging and payment systems

# Utilities and Environment...

## Emerging societal problems

- Provision of security for people´s life and goods
- Management of waste disposals

## Challenges to solve the problems

- Handling of disposals
- Efficiency in the lighting systems
- To efficiently handling of water, gas and other supplies networks

## Technical requirements and technologies

- Extremely scalable, flexible, reliable and deterministic communication technologies
- Geolocalization
- Sensor networks.



# Deployment Service

# Deployment Service - Platform

Platform that would be necessary for implementing and deploying the application domains. The missing piece is the establishment of a common consolidated API and resource abstraction.

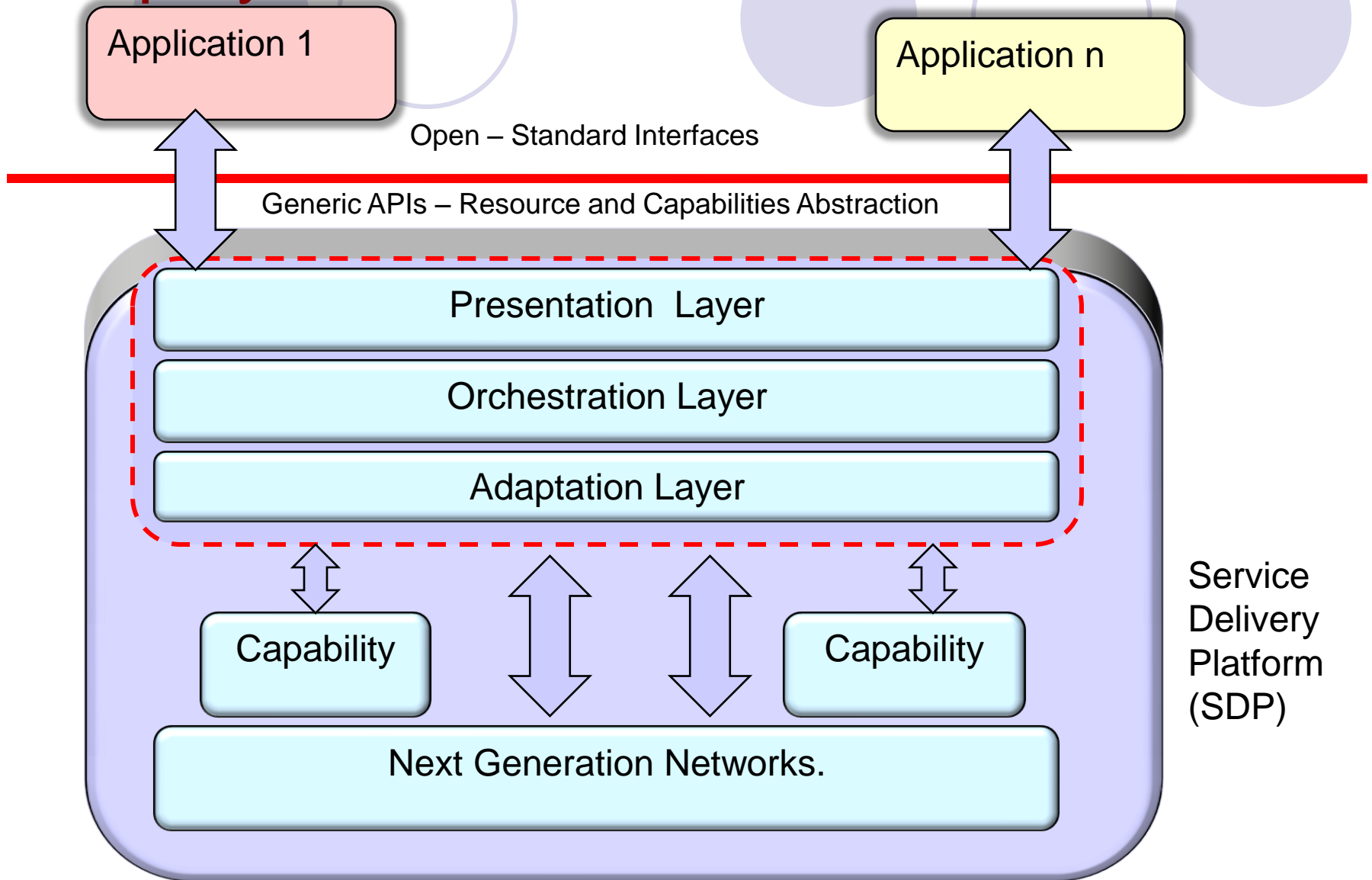
## Scope

- Provision of technologies – Recombination of technologies to build an **unique “Open Platform”**
- The Platform must provide open standard interfaces towards all Application Domains.
- The new interfaces will form playground for the fast development of new application and services
- It must be a pan-European platform that handles the content exchange.

## Features

- It must encompass the capability of mediating the flow of information and control between actuators, sensors and applications.
- It uses the network resources and capabilities
- It must provide content storage, meta-data, cloud computing capabilities, ability to encompass any kind of device (e. g. home devices), cdns etc.
- It contains a set of Capabilities (localization, presence, handling of multimedia resources, voice etc.) that give the platforms further capabilities.
- Orchestrate the resources to compound more complex services. The Platform performs adaptation functions.
- It aggregates data from multiple sources (e.g. from sensing, thus facilitating the further processing by the applications.

# Deployment Service - Possible Structure



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\*The EPOC platform and other internal developments could be the basis for this development.

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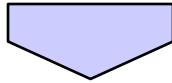
# Phasing of work/Implementation Plan - Milestones

# Structure of the Projects - Phasing

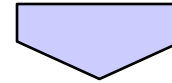
The basic proposal was to have individual projects for each Application Domain (no more than 5 areas at this stage so as to avoid fragmentation of efforts and subcritical projects) developing **service requirements and specifications** for their application domain.

In parallel there should be **a large project working to develop the platform** that would be necessary for implementing and deploying the service. (Deployment Service). That is the target-kernel project.

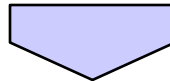
This structure is a well coordinated and properly managed Programme of activities and not simply the aggregation of individual projects



The main achievements now would be the emergence of large scale experiments in many locations across Europe. In each usage area, one would expect to have several hubs distributed throughout Europe and involving entities that could deploy and sustain a large scale experiment.

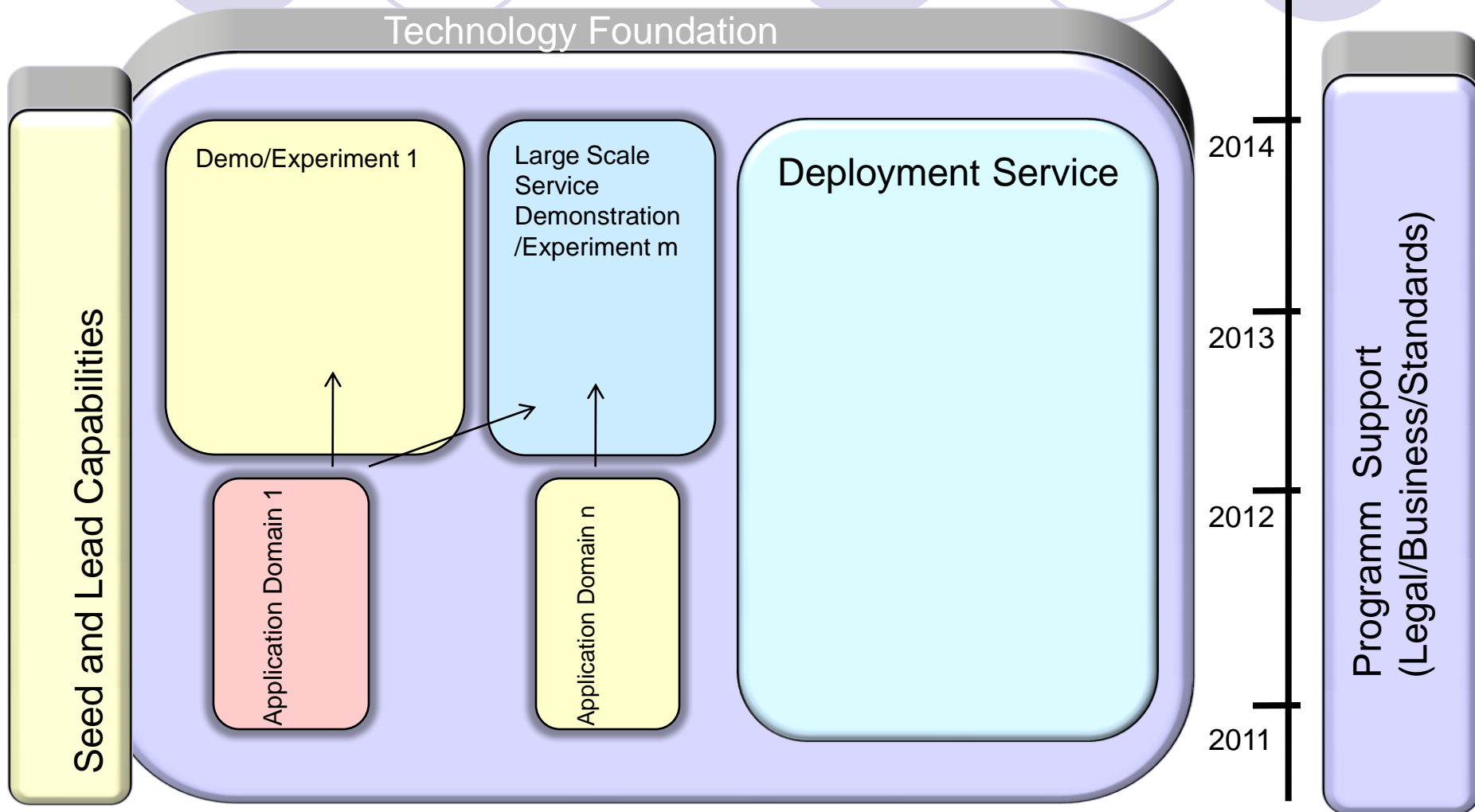


These trials must have several Open APIs that would allow application developers (mainly SMEs) to develop and trial services, in phase 3, exploiting network information and developing new applications.



Each trial might be served by one or more SDPs, as they interoperate through a Federation

# Approach – Structure of the Development



# How could es.internet collaborate?

- It is an open call. Anybody can propose.
- However, large proposals are going to have more impact
  - We need to prepare large but focused consortiums
  - Based on synergic collaboration
  - With specific application examples
    - Emphasis on demonstrations