



NEXOF-RA Project

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Non-Functional Aspects WP leader

- NESSI: a European Technology Platform
- The NESSI Holistic Model
- NEXOF - NESSI Open Framework
- NEXOF-RA: NEXOF Reference Architecture

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Service is something used but not owned

- **Lower the risks** for customers and improve value and reliability
- **Increase process flexibility** for businesses as well as public administrations
- **Accept complex world environments**, and co-operate on standards, so the end-user value can be created for a huge number of people

**NESSI is about transforming the
EU economy through Service
Oriented business models**

- The context - European Technology Platform



- Strategic?

NESSI aims to provide a unified view for European research in Services Architectures and Software Infrastructures

Today, NESSI partners represent 1.7 Million strong workforce and 490 B€ in revenues

In US, SRII launched in March 2007 (www.thesrii.org)!!!

Internet:

- Phase 1 = “connectivity”
 - 80’s-90’s internet as communication (eg. email)
- Phase 2 = “show room”
 - 90’s publication of first web sites, internet infrastructure
- Phase 3 = “universal library”
 - 2000’s easy access to any kind of unstructured content (Google), active role of users (eg. WikiPedia)
- Phase 4 = “Transform the Internet to service your business”
 - 2010’s ...

Dreaming the “net economy”

Implementing the “net economy”

Implementing the “**service** economy”

“Transform the Internet to service your life”

- “Internet” to be
 - **Alive** (through services)
 - (pervasively) **Trusted**
 - **Rich** (due to knowledge)
 - **Invisible** (ICT)

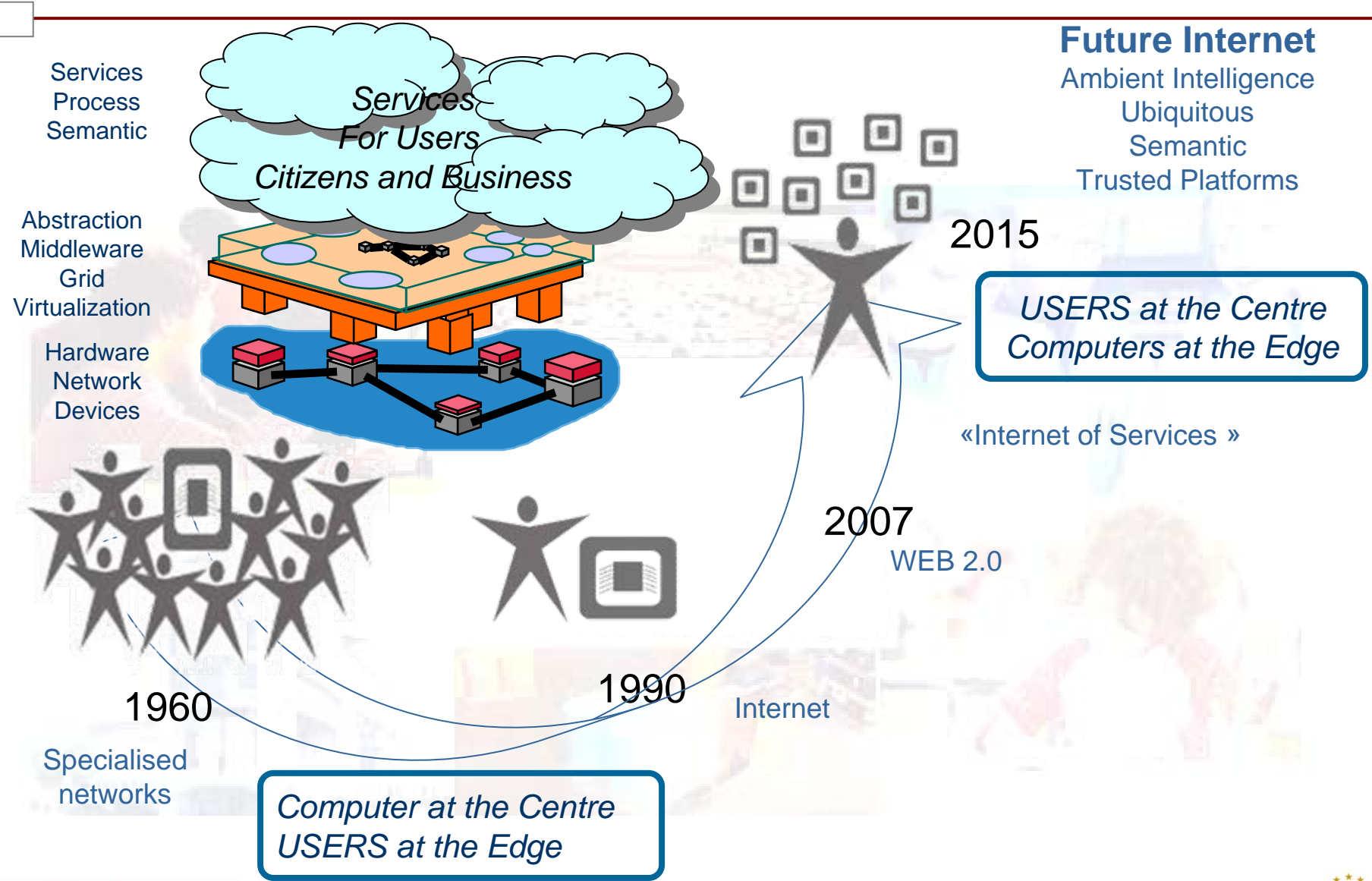
Can internet interact?

Can trust be real-time?

Can internet react to events and generate experience?

Can computers disappear?

From Internet to "Future Internet"





- The “tool” of an ETP is its Strategic Research Agenda

- Moving from vision to definition
- Frame the context
- Refine the Technological scope
- Build it “together”

- **SRA – Vol. 1 – Framing the future of the service oriented economy**

- (Feb. 2006) On the portal (www.nessi-europe.eu)

- **SRA – Vol. 2 – Strategy to build NESSI**

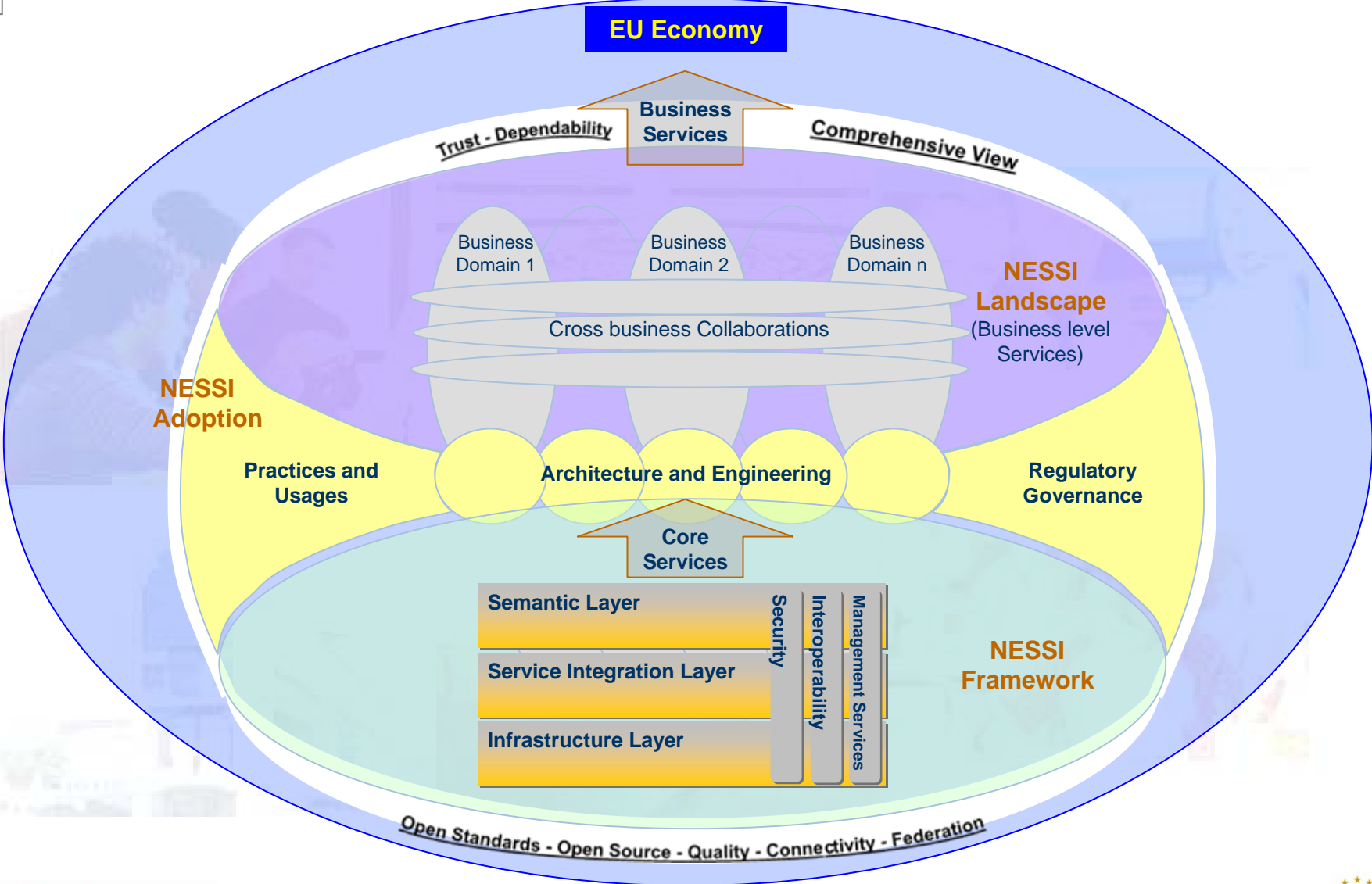
- (2° NESSI General Assembly 11-12 Dec 2007)

- **SRA – Vol. 3.x – Roadmaps (phased in short, mid and long term)**

- (Jun. 2006) FP7 Input 1 (sketch of short term road-map)
- (Feb. 2008) FPT Input 2 (sketch of short term road-map)

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■ NEXOF

■ Motivation

■ Main concepts

■ NEXOF-RA

■ Project motivation

■ Project innovation

■ Main project results

■ Contribution to NEXOF

■ Consortium partners

The NESSI Open Framework is an integrated, consistent and coherent set of technologies and associated methods and tools intended to

- provide European Industry and the Public Sector with efficient services and software infrastructures to improve flexibility, interoperability and quality;
- master complex software systems and their provision as service oriented utilities;
- establish the technological basis, the strategies and deployment policies to speed up the dynamics of the services eco-system;
- develop novel technologies, strategies and deployment policies that foster openness, through the increased adoption of open standards and open source software as well as the provision of open services;
- fostering safety, security and the well-being of citizens by means of new societal applications, enhanced efficiency of industry and administrations, and competitive jobs.

NESSI Open Service Framework

- Open Reference Model (ORM)
 - Concept and Principles
- Open Reference Architecture (ORA)
 - Standards
- Open Reference Implementation (ORI)
- Conformance Test Suite

“The Independence Principle”

Size

Domain

Technology



■ Reference Implementation

- A defined set of **integrated** concepts, methods and technologies (e.g. tools, platform) implementing the reference architecture
- Business services are not part of the O.R.I.
- Implementation to allow/encourage “**derivative works**”
- Nothing in the O.R.I. can prevent derivative work and other implementation

NEXOF layered Functional View

SLA@SOI

SOA4ALL

RESERVOIR

MASTER

EzWeb

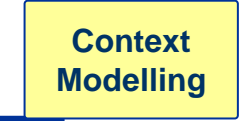
"System" Platform

Service Platform

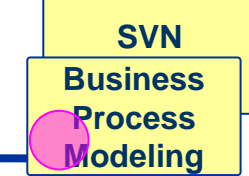
Monitoring

Engineering tools

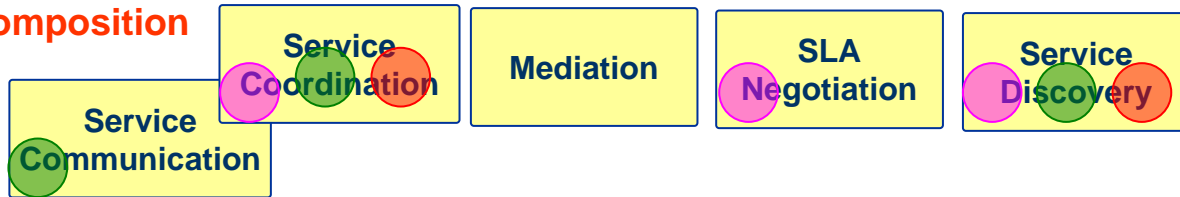
offered as services



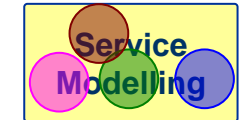
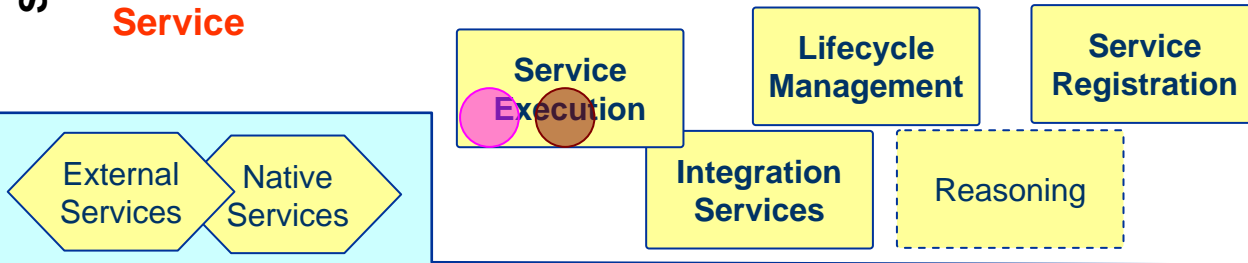
BPM view



Composition



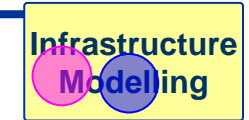
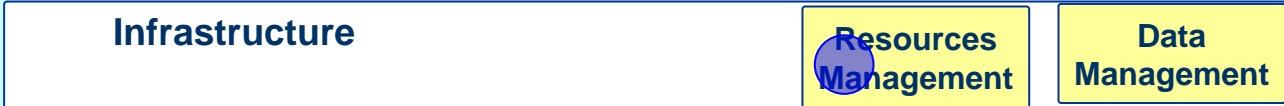
Service



Abstracted Infrastructure



Formal Languages



- NEXOF
 - Motivation
 - Main concepts
 - NEXOF-RA
 - Project motivation
 - Main project results

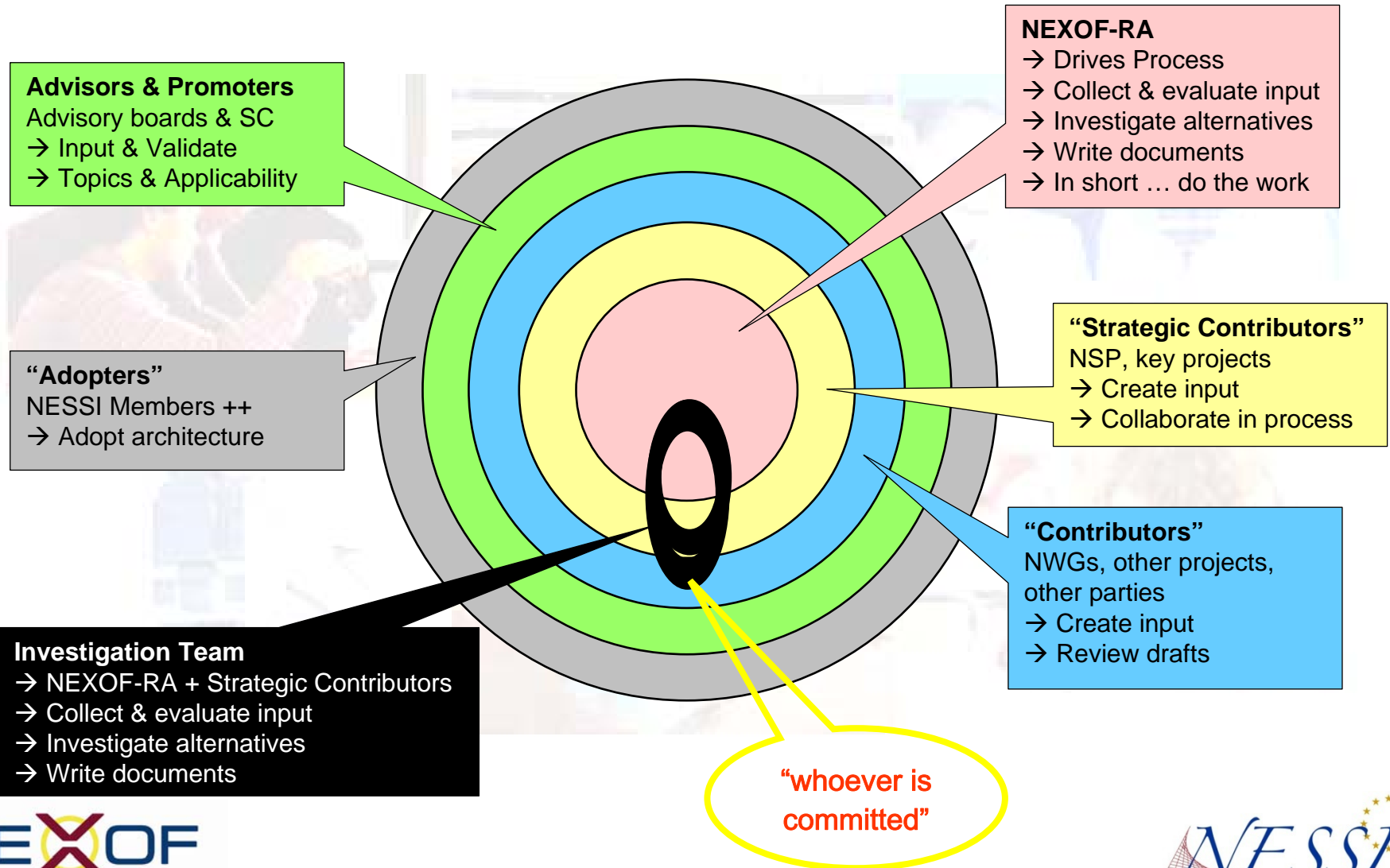
- “Deliver a **coherent** and **consistent** open service framework, ranging from the infrastructure up to the interfaces with the end users, **leveraging research** in the area of service-based systems to consolidate and trigger innovation in service-oriented economies”
- NEXOF-RA is a step in the process of building and creating the conditions for the adoption of the whole of Open Service Framework
- The aim is that the RA will be built through consensus within the NESSI Community, validated by the NSPs and widely adopted to support the European Service Economy

NESSI Open Service Framework

- Open Reference Model
→ Concept and Principles
- Open Reference Architecture
→ Standards
- Open Reference Implementation
- Conformance Test Suite
- Validation of NEXOF instances in real scenarios

NEXOF-RA

- Proof-of-concept
- NEXOF Roadmap



- SUI.1 – declarative authoring languages for user interfaces
- SUI.2 – contextual adaptation
- SUI.3 – basic definition model for front-end resources
- SUI.4 – REST-based open service catalog APIs
- SP.1 – distributed registries
- SP.2 – distributed (intelligent) deployment / configuration
- SP.3 – interoperability (cross standards)
- SP.4 – event-driven architecture
- SP.5 – system federation → security/policy federation
- SP.6 (+SQ) – semantic description of non-functional aspects
- SP.7 – service description techniques (selection, overcome limits)
- SP.8 – SLA and service negotiation

- SP.9 – transaction
- SP.10 – process definition
- SP.11 – access to current assets / legacy integration
- SOI.1 – definition of infrastructure services
- SOI.2 – description of infrastructure services
- SOI.3 – describe functional and non-functional characteristics of infrastructure services
- SOI.4 – usage and management reference points to be exposed
- SOI.5 – SLA parameters (offering guarantees)
- SQ.1 – privacy, incl. data protection architectures
- SQ.2 – access rights framework based on semantics
- SQ.3 – behaviour analysis and dynamic security in SOA
- SQ.4 – multi-level security in interconnected systems
- SQ.5 – secure SOA
- SQ.6 – Architectures for Highly Available Services – includes security aspects
- SQ.7 – identity management



- software to prove key architectural choices
 - possibly multi & cross platform deployments
- guidelines and blueprints for instantiation
- possibly based on outcomes from FP6, FP7 (including NSPs)
 - for FP6, consider e.g. Athena, NextGRID, SecSE, Prime, Serenity, QualiPSo; need to ask the projects for input
- not a reference implementation of the RA
- not designed for any specific user, internal validation use
- public, but not supported (e.g. IBM alphaworks)

Project scope and objectives: Roadmap

It is the strategy for the building and adopting NEXOF. This consist of:

- Strategic plan
- Requirements for NEXOF
- Methodology to implement the plan
 - Supporting tools (e.g. CWE, Repository)

Engineering Ingegneria Informatica S.p.A	Italy
Alcatel-Lucent France	France
ATOS Origin S.A.	Spain
British Telecommunications plc	United Kingdom
Hewlett Packard European Laboratories – Bristol	United Kingdom
IBM	Israel
Lero at University of Limerick	Ireland
Lero at University of Duisburg-Essen	Germany
Logica CMG	The Netherlands
MoMa - Modelli matematici ed applicazioni S.r.l.	Italy
Siemens Gmbh	Germany
TIS Techno Innovation Alto Adige S.C.p.A.	Italy
Telefonica Investigacion y Desarrollo	Spain
Thales	France
TIE	The Netherlands
Universidad Politecnica de Madrid	Spain

- **NEXOF-RA** aims at **standardise** the way services are built, offered and consumed. There is the need for a Reference Service Architecture
- The **Reference Architecture** should be defined in order to allow any business domain, size and technologies
- Implementing a **Reference Architecture** is not a single shot
- Implementing a **Reference Architecture** requires a large community with contributions from many sources.

21 July 2008
launch of the first Request For Contribution

www.nexof-ra.eu