Wireless World Research Forum

Win-win approach for all

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WWRF chairman

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www.wireless-world-research.org

Shaping the Global Wireless Future

- Influencing decision makers' views of the Wireless World
- Enabling powerful R&D collaborations
- Advancing wireless frontiers to serve our customers

Wireless World Research Forum

Outline

- **WWRF objectives and workplan**
- WWRF membership and structure
- WWRF vision and approach
- Conclusions

WWRF - Objectives and scope

- Major objectives
  - develop a consistent **vision of the future Wireless World**
  - generate, identify, and promote research and trends
  - identify and assess the potential of new technologies and trends
  - contribute to the **definition of research programs**
  - **ease future standardization** by harmonizing and disseminating views
- Scope
  - concentrate on the definition of research items
  - open to all actors

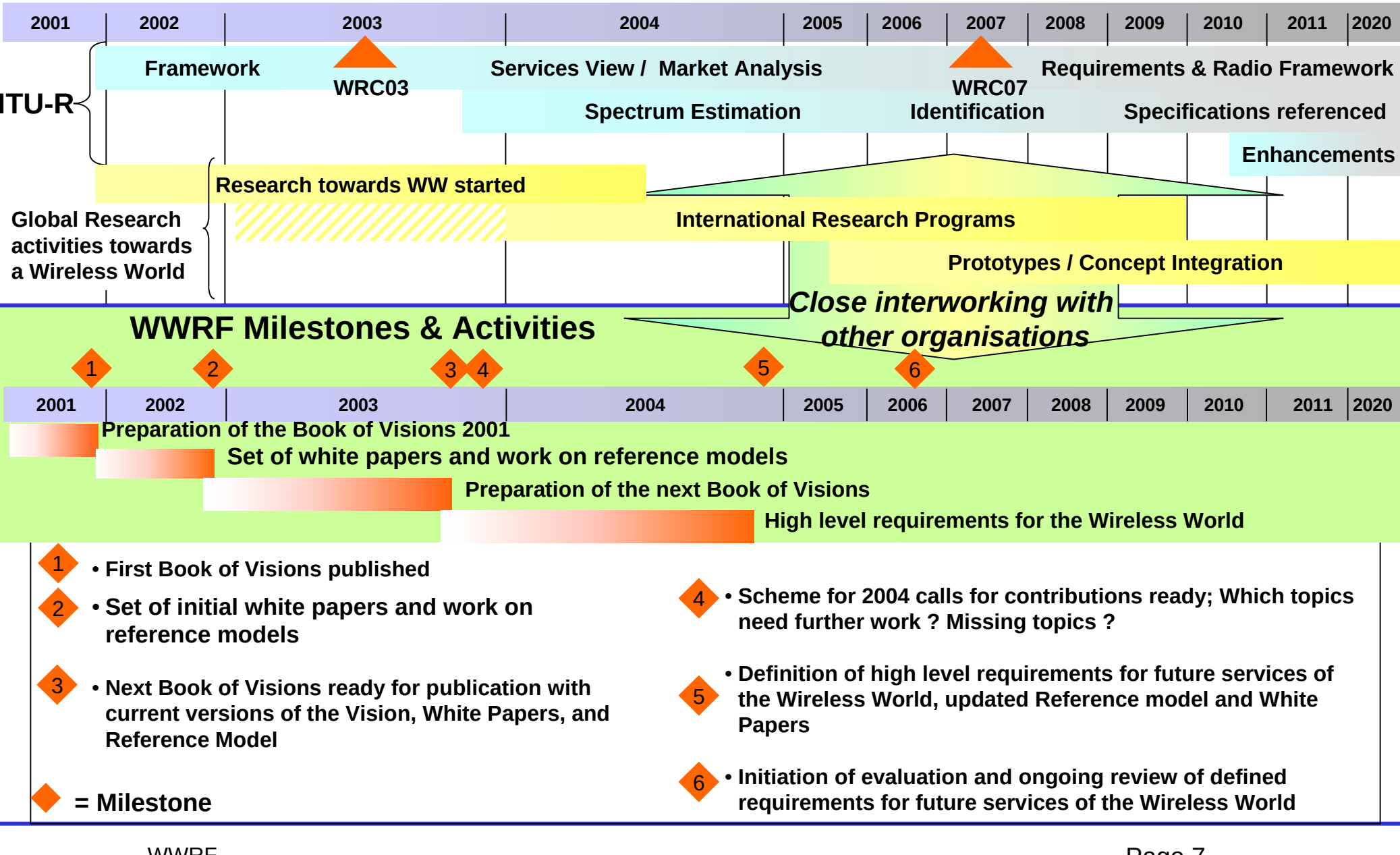
Motivators to join WWRF

- Influence
- Understand
- Get consensus prior to standardization
- Open exchange of ideas
- Reduce risk for investment in research
- Networking
- Facilitate funding
- Publications

Deliverables

- Input: Contributions to meetings and working groups
- Output deliverables:
  - White Papers on different topics
  - Book of Visions, new edition submitted for publication
  - IEEE Communication Magazine theme issue
  - Book publications together with e.g. IEEE Press

Global context towards the Wireless World



1 • First Book of Visions published

2 • Set of initial white papers and work on reference models

3 • Next Book of Visions ready for publication with current versions of the Vision, White Papers, and Reference Model

◆ = Milestone

4 • Scheme for 2004 calls for contributions ready; Which topics need further work ? Missing topics ?

5 • Definition of high level requirements for future services of the Wireless World, updated Reference model and White Papers

6 • Initiation of evaluation and ongoing review of defined requirements for future services of the Wireless World

WWRF meeting schedule for 2004

WWRF 8th bis Meeting February 26-27 Bei[illegible] China
[illegible]ITRDC

300+ participants, key people from
China and rest of the world

[illegible]ject

WWRF 11th Meeting June 10-[illegible] Oslo, Norway
Telenor Research

call for trends and visions
scenarios, project post[illegible]
theme: services a[illegible]maps in different areas, like automotive

Attendance > 250 per event with key industrial and governmental leaders

WWRF 12th M[illegible] November 4-5 Toronto, Canada
Bell Canada,
Nortel Networks

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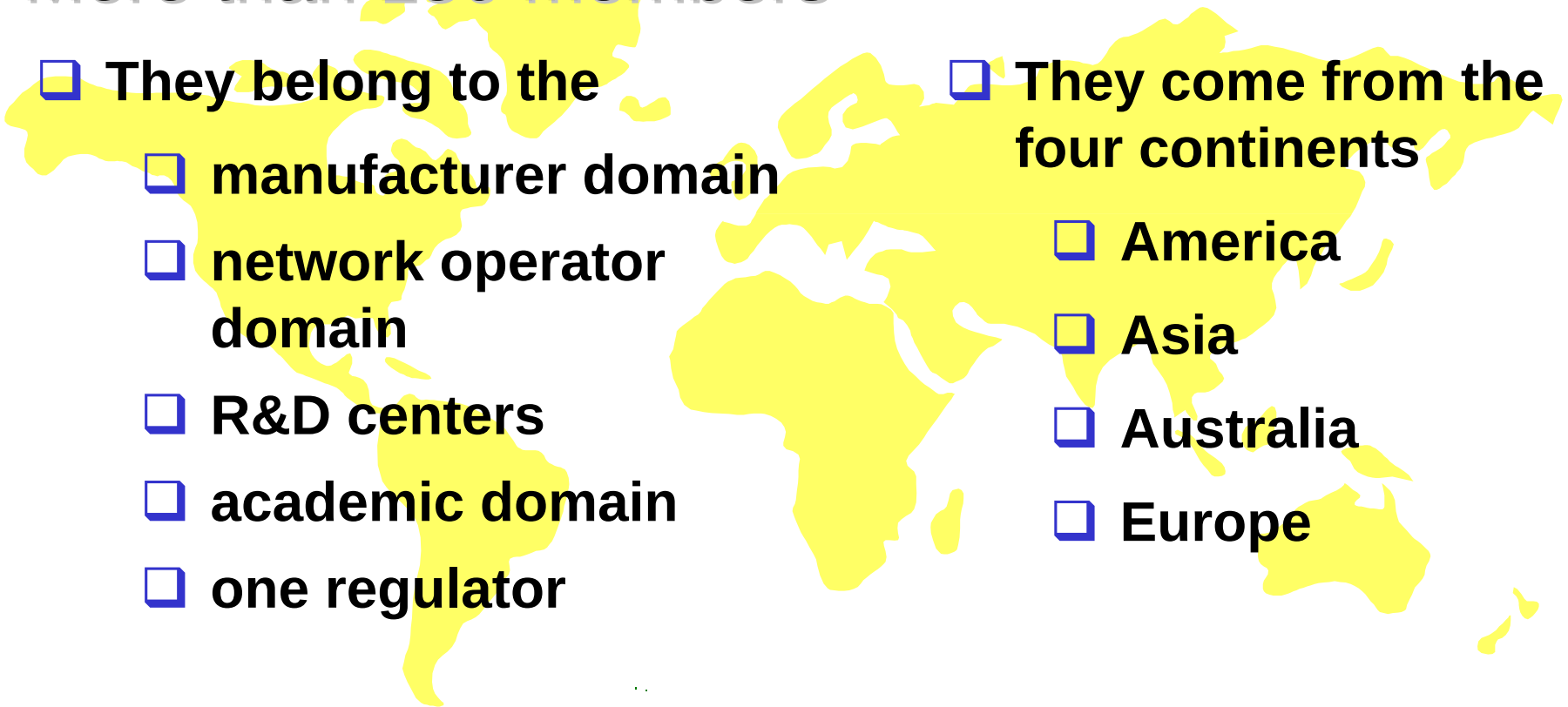
WWRF membership

More than 150 members

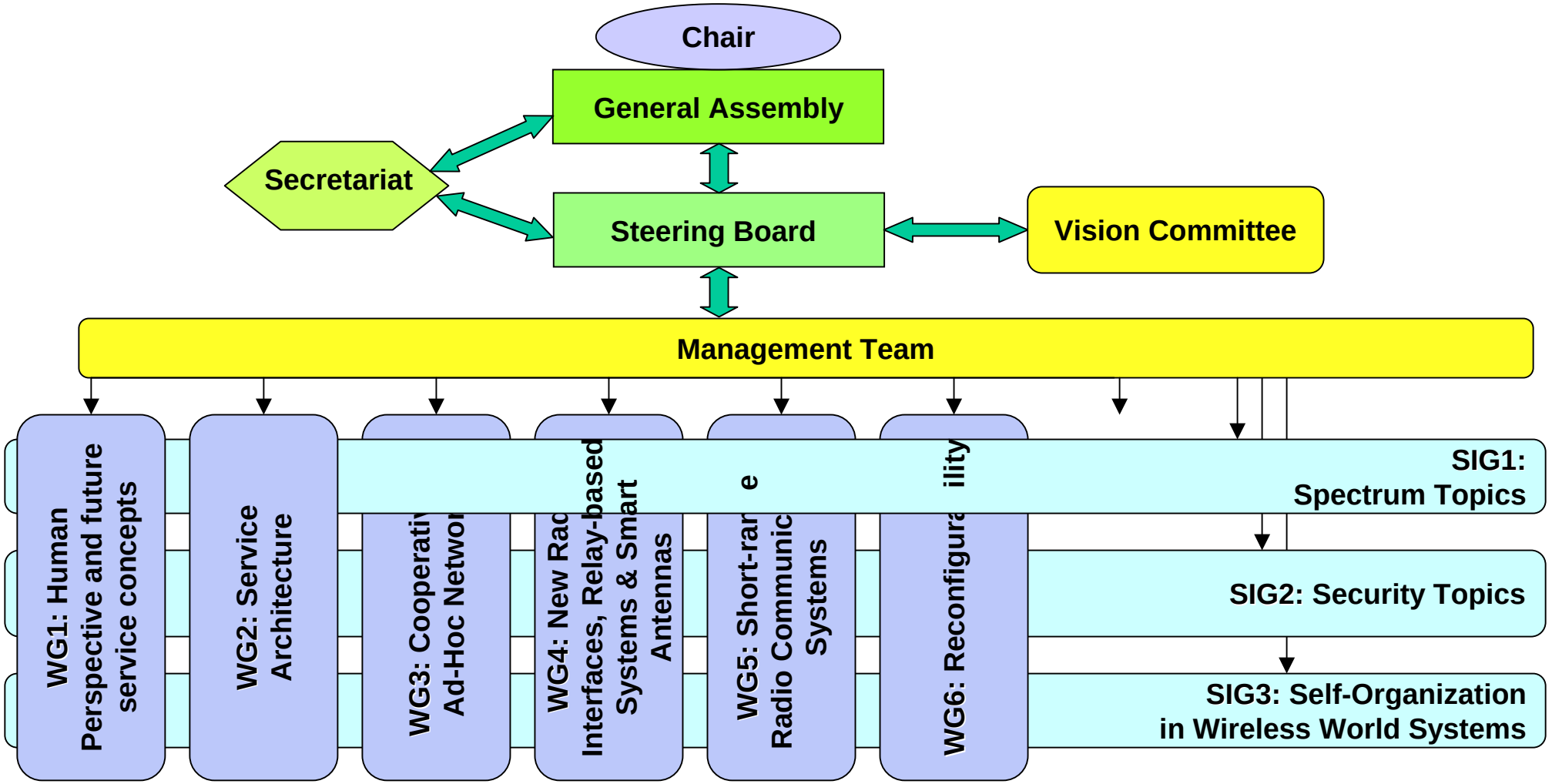
- They belong to the
  - manufacturer domain
  - network operator domain
  - R&D centers
  - academic domain
  - one regulator
- They come from the four continents
  - America
  - Asia
  - Australia
  - Europe



Sponsor members

- Alcatel
- Bell Canada
- Ericsson
- EURESCOM
- France Telecom
- IBM
- Intel
- LGE
- Lucent
- Motorola
- NEC
- Nokia
- Nortel
- Philips
- Raytheon
- Samsung
- Siemens
- Sony
- Vodafone

WWRF structure



WWRF executives

- Chair: Mikko A. Uusitalo, Nokia, Finland
- Vice Chair Americas: Miguel Pellon, Motorola, US
- Vice Chair Asia: Young Kyun Kim, Samsung, Korea
- Vice Chair Europe: Brigitte Cardinael, France Telecom, France
- Treasurer: Fiona Williams, Ericsson, Germany

Working Group and SIG Chairs

- WG1: Angela Sasse, University College London, UK
- WG2: Stefan Arbanowski, Fraunhofer Fokus, Germany
- WG3: Petri Mähönen, RWTH Aachen, Germany
- WG4: David Falconer, Carleton University, Canada
- WG5: Gerhard Fettweis, University of Dresden, Germany
- WG6: Panagiotis Demestichas, University of Piraeus, Greece

- SIG1: Pekka Ojanen, Nokia, Finland
- SIG2: Nigel Jefferies, Vodafone, UK
- SIG3: Amardeo Sarma, NEC, Germany

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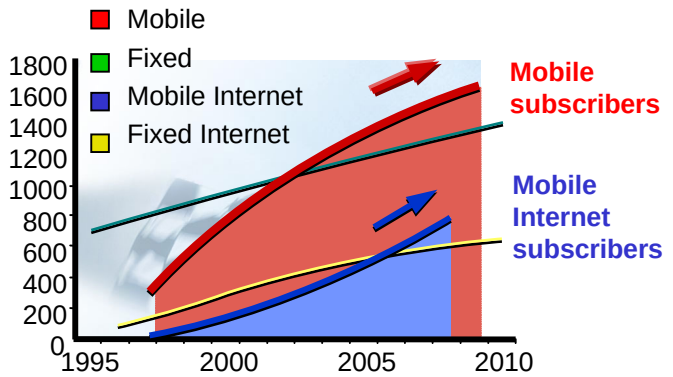
The major trends at a glance

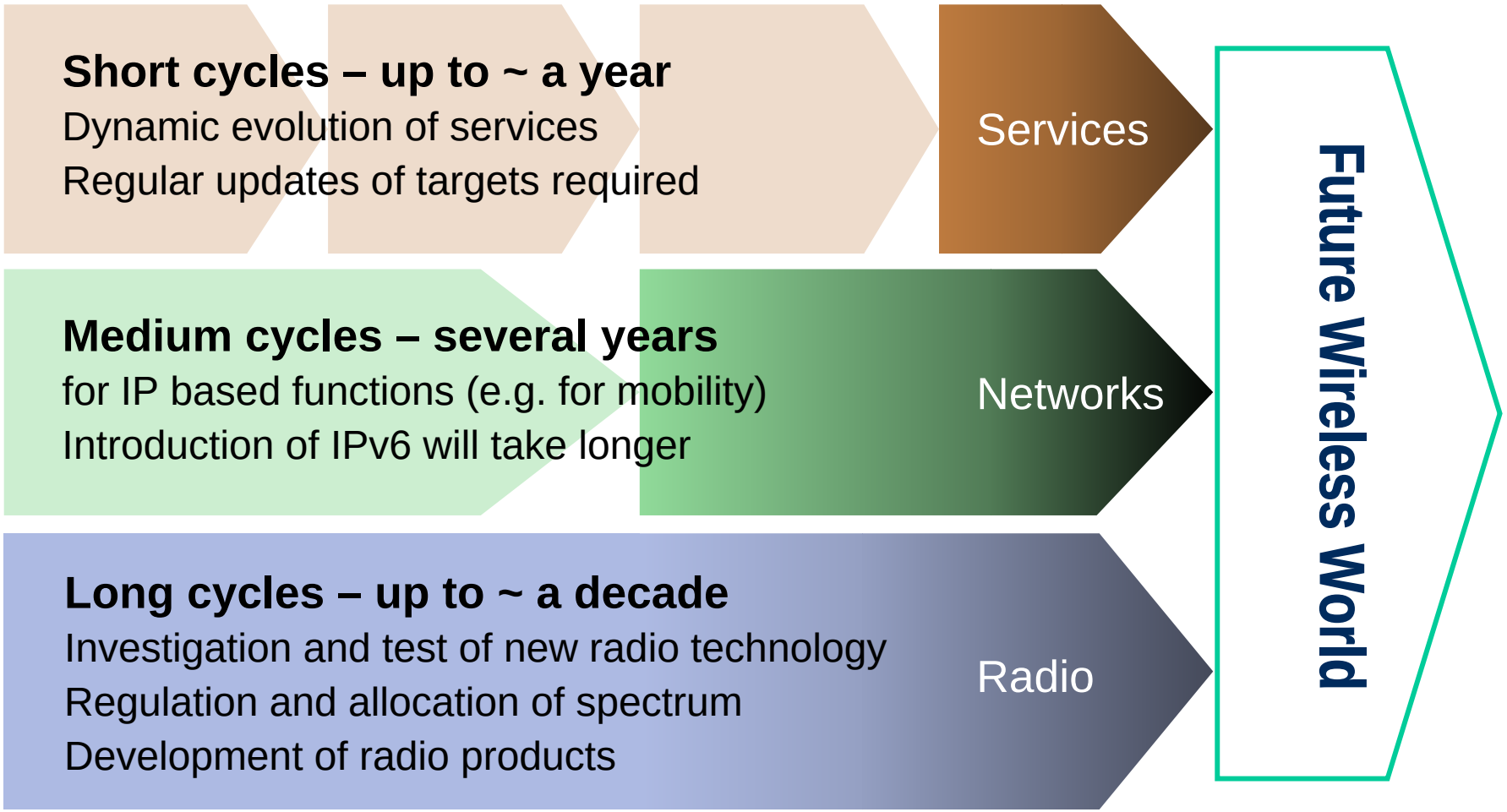
- Advance of the Internet
  The Internet has become a mass medium and IP the leading network protocol.
- Advance of mobile communication
  Communication via mobile radio networks is still increasing enormously.
- Bandwidth evolution
  The available bandwidth is exploding and the prices for bandwidth decrease dramatically.



Subscriptions worldwide (millions)

- Convergence of digital industries
  The converging digital industry brings together parts of the consumer electronics, communication, information technology, media and entertainment industries.
- Advance of e-commerce
  E-commerce changes and amends business processes tremendously.
- Deregulation and globalization
  The I&C markets move fast.
  Competition and differentiation are driven by deregulation and globalization.
- Services and applications are key
  The end user is interested in services and applications only, the underlying technology is not relevant to her or him.
- Reduced cost/bit

Cycles of innovation



MultiSphere Level Concept

Future Wireless World will cover different communication relations

① The PAN

② The Immediate Environment

③ Instant Partners

④ Radio Accesses

⑤: Interconnectivity

⑥ CyberWorld

Source: IST WSI Project

Key principles for WWRF vision

- **Users** are **in control through intuitive interactions** with applications, services and devices
- Services and applications are **personalized, ambient-aware, and adaptive** (I-centric) - ubiquitous from the point of view of the user
- **Seamless services to users, groups** of users, communities and **machines** (autonomously communicating devices) irrespective of place and network and with agreed quality of service
- Users, application developers, service and content providers, network operators and manufacturers can **create efficiently and flexibly new services and business models** based on the component-based architecture of the wireless world

Some challenges for the future wireless world 1/2

Starting point in addition to the key principles of vision : Humans

- Limited communication capabilities
- Interest in semantic
- Need to control and communicate as a prolongation of their human senses

I-, user- and group-centric challenges

- Exceed user expectations in terms of simplicity and functionality
- Enhance user experience through effortless, intuitive communication and information browsing and retrieval applications, featuring:
  - Natural interfaces, using all appropriate senses
  - Intelligence, context awareness and adaptiveness
  - High degree of personalization
- Manage conflict between diversity (of needs) and simplicity (of appropriation)
- Experienced added value exceeds cost

Device-centric challenges

- Creation and trial of many innovative devices (communicating objects)
- Autonomously communicating devices
- Nuts and bolts : weight, size, battery life, displays and audio quality….

Some challenges for the future wireless world 2/2

Service-centric challenges

- Seamless services irrespective of place and network and with agreed quality of service
- Support innovative applications (e.g. mobile multimedia, communicating objects)
- Efficient and flexible service and business model creation -> component-based open architecture and platform, generic service elements

System-centric challenges

- Independent evolution of different layers, e.g. services and networks
- E2E security, scalability, reconfigurability and manageability
- Requirements from convergence of digital industries
- IPv6 and beyond

Access Network –centric challenges

- Transparent, seamless and secure access across any access networks (short or long range, relayed, multiple hops, ad hoc)
- Connect a trillion devices, including machine-to-machine and sensor networks
- More efficient air interfaces and spectrum use, much higher bit rates, ubiquitous coverage
- All-IP architecture and beyond
- Flexibility, cognitive radio, self-managed systems

Current White Papers

- WG1
  - Scenarios and analysis
  - Reference model
  - UI technologies and techniques
  - UCD process
- WG2
  - Terminology (basic terms for WG2)
  - Business Model
  - Personalization
  - Ambient Awareness
  - Adaptability
  - Generic Service Elements
  - Enabling Technologies
- WG3
  - Vision and Roadmap (cooperative networks)
  - Research Challenges and Priorities
  - Architectural Principles
  - Network Component Technologies for Cooperative Networks
  - Ad Hoc Networking
- SIG1
  - Spectrum for Future Mobile Communications
- WG4
  - New Air Interface Technologies: requirements and solutions
  - Broadband Multi-Carrier Based Air Interface for Future Mobile Radio Systems
  - A Mixed OFDM plus Single Carrier Mode Air Interface
  - Relay-based Deployment Concepts for Wireless and Mobile Broadband Cellular Radio
  - Smart Antennas and Related Technologies
- WG5
  - Ultra Wideband
  - Short Range Communications
  - Short range optical wireless communication
  - Architecture of a Mobile Internet
- WG6 (R = reconfigurability)
  - Scenarios, requirements and roadmaps for R
  - Networs supporting functionality for R
  - Network design, resource and spectrum management in R context
  - Element management and R protocols, cognitive radio in R context

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Conclusions on WWRF

- Global platform to initiate global cooperation towards future wireless world
- Vision from user perspective → requirements for the enabling technologies
- Unique way of active cooperation within and between industry and academia
- Reduce risk for investment in research
- Ease future standardization by globally harmonizing views
- Proven history of creating large scale research cooperation and facilitating funding
- Open to all actors

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Reserve slides

International relations

- Formal liaison agreements with
  - UMTS Forum, signed on January 30, 2003
  - mITF, Japan, signed on May 30, 2003
  - IEEE ComSoc, signed October 29, 2003
- Many informal relationships with several organisations at the overall and working group levels