The Virtual Centre of Excellence in Mobile & Personal Communications:

Simon Fletcher (NEC)
MVCE Core5 Green Radio Industrial Chair

On behalf of Dr Walter Tuttlebee
Chief Executive, Mobile VCE

Industry led, world-class, strategic research
Financially supported by UK Government
Undertaken by top UK research Universities

Alcatel·Lucent

FUJITSU

NEC

orange

TOSHIBA

BBC

Huawei Technologies

NORTEL

SAMSUNG

Turner
A TimeWarner Company

BT

3
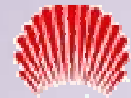
Nokia Siemens Networks

THALES

vodafone

MOBILE VCE

Not-for-profit: Strategic research to facilitate industry growth

The Company

Leading Edge R&D for the Global Industry

- World-Class, Industry-Led, Research that Grows the Industry
  - Established in 1996 by the communications industry
  - Major international companies
  - Not-for-Profit, funded by Industry Members & UK Government
  - High financial gearing of research funding:
    - 2009: £43.5k member subscription : £2-2.5m research programme
  - Research defined & steered by our Industry Members
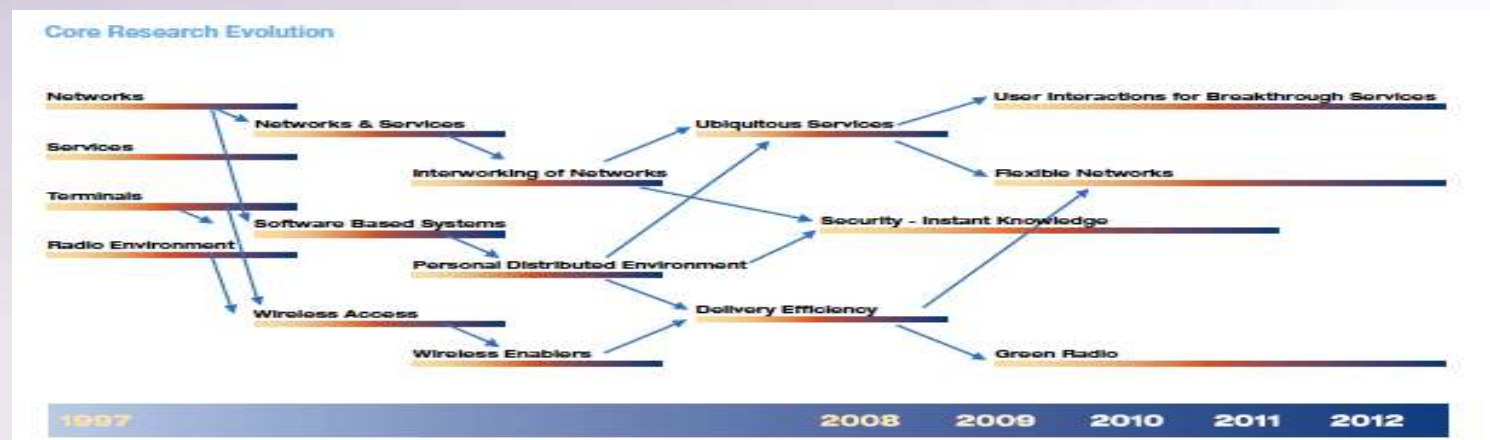
International Linkages

Europe

- eMobility – Experts Group, Mirror Group
- Regular contributions into WWRF (Global)
- Links with the UK Spectrum Regulator

Asia

- MoUs with leading research organisations in Japan, Korea & China
  - Researcher secondments - Japan 2004/2005
- Regional Conferences & Industry Missions
  - Japan, Taiwan, Korea & China
  - UK-Korea 1st & 2nd Future Mobile Forum, June 2004, Sept 2005
  - Future Mobile Technology Symposium, Japan, April 2002
  - Ubiquitous Networking Forum Event, (UK-J Telecom Bilateral), 2003

USA

- MoU with the Software Defined Radio Forum,
  - strategic technical contributions to their activities, common Director
- Increasing interest from North America

Objectives

Original Goals (1996)

- To **harness the research capability** of a selected group of UK universities into a cohesive world-class **Centre of Excellence**
- To influence the **direction of long-term research** through dialogue between industry & the academic community
- To carry out programmes of research with a focus on **cross-disciplinary** & **well-managed programmes**
- To provide a mechanism for industry to work collectively with key Universities to secure the necessary flow of the most **skilled experts**
- To secure **international recognition**

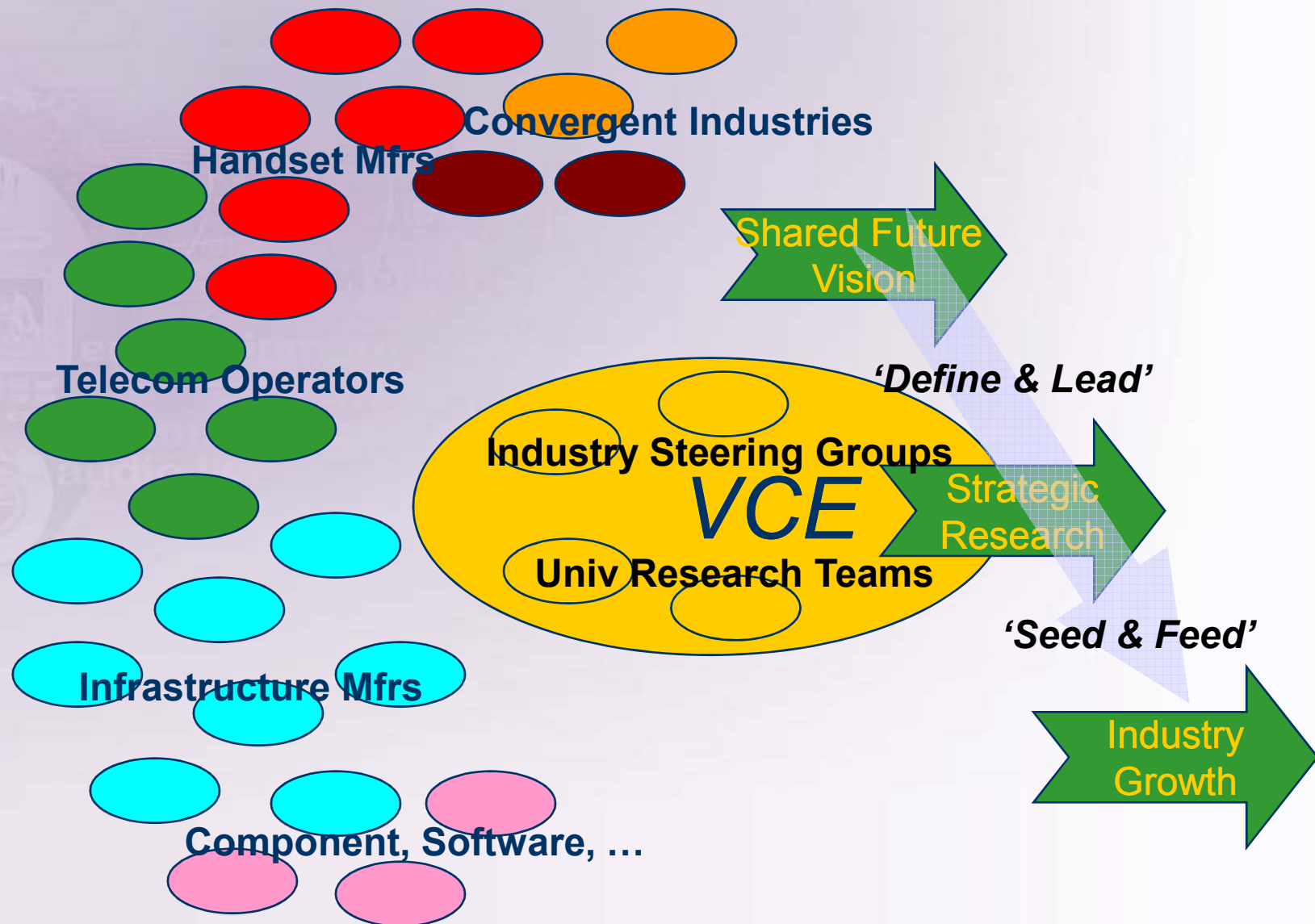*were achieved and exceeded by the early 2000's…*

Achieving the Objectives
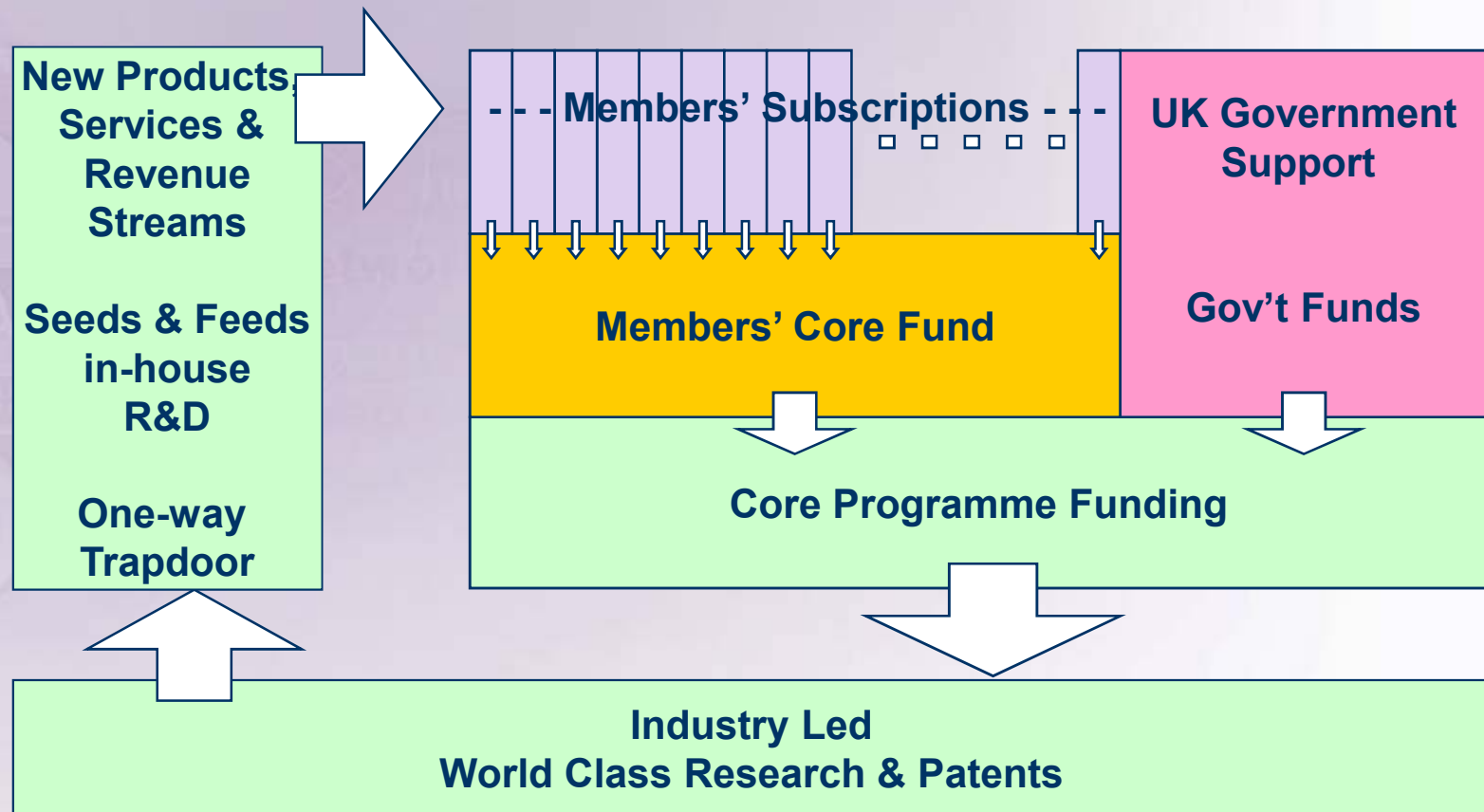
Critical Success Factors…

- **Strong & Sustained Industry Leadership**
  - Board of Directors, 5 industry, 3 university
  - Clear industry definition of goals & research responsibility

- **Commitment from the Universities to Deliver**
  - Mutual respect & esteem between industry & academics

- **Research Excellence**
  - Independently assessed as world class
  - Reflects both the university & industry inputs

- **Global Perspective & Engagement**
  - Industry membership from Asia, America & Europe
  - Industry membership from across the value chain / value web

Approach:
Strategic, Industry-led, Research

Convergent Industries

Handset Mfrs

Telecom Operators

Industry Steering Groups

VCE

Univ Research Teams

Infrastructure Mfrs

Component, Software, …

Shared Future Vision

'Define & Lead'

Strategic Research

'Seed & Feed'

Industry Growth

Operating Model

New Products, Services & Revenue Streams

Seeds & Feeds in-house R&D

One-way Trapdoor

- - - Members' Subscriptions - - -

UK Government Support

Members' Core Fund

Gov't Funds

Core Programme Funding

Industry Led
World Class Research & Patents

- **High financial gearing**
- **Strengthens the UK research base available to the global industry**
- **Known, qualified, research staff who appreciate industry's needs**

Approach: Vision Led Research

A Global View

- Mobile VCE Industry Members, based in the key Geographical Regions, develop shared long term vision:
  - Europe – strong traditional 'telecom' providers…
  - America – home of the free market, of the Internet pioneers…
  - Asia – high growth markets, new suppliers, new requirements…
  - ALL the global players seek to have a global view, which is coloured to differing degrees by local factors and pace of change

- Technology, Products & Markets
  - Today's Trends - Industry members
  - Tomorrow's Possibilities - Academic members

Two Types of Research

Core Programmes

- Integrated, strategic, research funded by member subscriptions
  - All industry members define, participate, share the benefits & have royalty-free access to IPR. Attracts additional UK government funding
- Core 1 1997 – 2000, ~50 myrs
- Core 2 1999 – 2003, ~100 myrs
- Core 3 2002 – 2005, ~75 myrs
- Core 4 2005/06 – 2009/11, ~130 myrs
- Core 5 2009 – 2012, ~100 myrs

Elective Programmes

- Research projects commissioned by one or more industrial members
  - Programmes are usually initiated a single industry member
  - Mobile VCE helps identify industrial members with common research needs
  - Industry players select the most appropriate university team assisted, if needed, by Mobile VCE – specialist research manpower
  - Examples – MIMO channel characterisation, intelligent handset antennas, …

Core Research Definition

'2020 Vision'

- Outworking the 2nd Century of Radio
    - Usable, Embedded, Ubiquitous, Networked

- Two Realms of Impact
    - Mass Market - Personal Lifestyle
    - Enterprise - Transformation of *other* Industries

- Resultant Core 5 Research Themes
    - User Interactions for Breakthrough Services
    - Designing Flexible Networks
    - Green Radio

Core 5 User Interactions

Interactions with:

- A new device ecosystem
- The user's environment - woven into the fabric of life
- Intelligence in the network

- Re-defining the user experience & simplifying complexity
- Enabling new personalised, contextualised, capabilities

Core 5 Flexible Networks

Adaptable

- Unpredictable user needs
- Evolvable architecture
    - Virtualisation, Robustness, Efficiency
- Intelligent
- Service agnostic
- Tailored 'user experience'
- Self-validating

Business-Model-Neutral

- Autonomous management
- Seamless & 'Invisible'

Core 5 Green Radio

The Drive for Bandwidth

- Faster, fatter = higher power (unless we change)
- Bigger, better amplifiers
- Power hungry base stations

Going Green

- Efficient wireless
    - Green = Reduced OPEX !
- Backhaul challenge
- Spectrum awareness
- Energy efficient multipliers
    - Goal: 100x improvement

Thank you !

MOBILE
VCE

New Industrial members are welcomed
For further information please contact:

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