THE NEW TECHNO-ECONOMIC PARADIGM
and the importance of ICT policy for the competitiveness of the whole economy

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GROWTH OPPORTUNITIES for firms, countries and regions ARE A MOVING TARGET

TODAY’s successes stem from YESTERDAY’s correct anticipatory strategies

We need to imagine what TOMORROW will be like
HOW CAN WE LOOK AHEAD WITH SOME DEGREE OF CERTAINTY?

Important lessons from historical regularities
RESEARCH ON TECHNOLOGICAL REVOLUTIONS REVEALS A RECURRENT LONG TERM DYNAMIC

REGULAR SEQUENCES

- Successive revolutions every 40-60 years
- A financial bubble collapses at about mid-diffusion
- A diffusion sequence of 8-12 year phases (with a marked change in business climate)

SYSTEMIC UNIQUENESS

Economic success for the whole 40-60 years of each technological revolution:

DEPENDS ON A DIFFERENT AND SPECIFIC PARADIGM

which defines best competitive practice
FIVE TECHNOLOGICAL REVOLUTIONS IN 200 YEARS

1771: THE "INDUSTRIAL REVOLUTION" IN ENGLAND

1829: THE AGE OF RAILWAYS, COAL AND THE STEAM ENGINE

1875: THE AGE OF STEEL, ELECTRICITY AND HEAVY ENGINEERING

1908: THE AGE OF OIL, THE AUTOMOBILE, PETROCHEMICALS AND MASS PRODUCTION

1971: THE AGE OF INFORMATION TECHNOLOGY

Each brings major changes in the world economy.
Massive structural change

Rejuvenation and modernisation of the whole economy

NEW DYNAMIC INDUSTRIES

A powerful cluster of new products and processes and new infrastructural networks

A QUANTUM JUMP IN PRODUCTIVITY FOR ALL ACTIVITIES

NEW FIRMS AND INDUSTRIES BECOME ENGINES OF WORLD GROWTH

DOUBLE NATURE OF EACH TECHNOLOGICAL REVOLUTION

NEW TECHNO-ECONOMIC PARADIGM

New all-purpose technologies, new organisational principles, different business models and low-cost facilitating infrastructure

A NEW TECHNO-ECONOMIC PARADIGM

NEW DYNAMIC INDUSTRIES

Massive structural change
THE LIFE TRAJECTORY OF A TECHNOLOGICAL REVOLUTION

Deployment of potential

Time

Previous revolution exhausted and declining

Techno-economic paradigm defined

IRRUPTION

Maturation

Next revolution in gestation

FORTY TO SIXTY YEARS FROM IRRUPTION TO MATURITY

Source: Based on Nelson and Winter, Dosi, Wolf, Abernathy and Utterback, Arthur, etc.
But historically the pattern is broken in two parts:

- **First 20-30 years**
  - **INSTALLATION PERIOD**
  - **ESTABLISHMENT OF NEW PARADIGM:**
    - “creative destruction” of the old one

- **Second 20-30 years**
  - **DEPLOYMENT PERIOD**
  - **FLOURISHING OF FULL POTENTIAL**
    - of the triumphant paradigm

**TIME**

1971

**We are here**

2000

**INSTABILITY AND UNCERTAINTY**

**TURNING POINT**
THREE VERY DIFFERENT SOCIO-ECONOMIC CLIMATES

1. **First 20-30 years**
   - **INSTALLATION PERIOD**
   - DECLINE of the old economy
   - EMERGENCE of the new
   - followed by BIG FINANCIAL BUBBLE
     - Canal mania,
     - Railway mania,
     - Roaring 20s,
     - Internet mania

2. **Second 20-30 years**
   - **DEPLOYMENT PERIOD**
   - GOLDEN AGE OF GROWTH
     - Victorian boom, Belle Époque,
     - Post War Golden Age
     - Flourishing of the whole economy

3. **TURNING POINT**
   - Post bubble recession (sometimes depression)
   - Instability
   - INSTITUTIONAL RECOMPOSITION
     - Regulation and expansive policies

**Time**

- 1971
- 2000
- A TIME TO ACT
WHICH POLICIES CAN FACILITATE THE SUCCESS of all economic sectors IN THE NEXT GOLDEN AGE?

Those providing the context for competitiveness in the present techno-economic paradigm

Today that means ICT!
IN THE DEPLOYMENT PERIOD OF EACH REVOLUTION

THE INFRASTRUCTURAL NETWORKS ARE THE PLATFORM FOR COMPETITIVENESS

Global digital telecommunications and ICT support networks

THE AGE OF INFORMATION TECHNOLOGY

Electricity, telephone, highways and airways

THE AGE OF OIL, THE AUTOMOBILE PETROCHEMICALS AND MASS PRODUCTION

Transcontinental communications: Steamships, railways and telegraph

THE AGE OF STEEL ELECTRICITY AND HEAVY ENGINEERING

Railways, penny post and telegraph

THE AGE OF RAILWAYS COAL AND THE STEAM ENGINE

Canals, turnpike roads and mail coaches

THE “INDUSTRIAL REVOLUTION” IN ENGLAND
The main trends of the paradigm shift depend on ICT

- Coordination of complex global networks, value-chains and multiple alliances
- World market segmentation, niche targeting
- Hypermarkets
- Worldwide franchise and supplier networks
- Global off-shoring and re-specialisation

- Rapid and constant response to markets
- Dynamic product mix
- Continuous innovation [CAD, CAE, compu-synthesis, compu-simulation, etc.]
- Adapting to user requirements [fine specialisation]

- Human capital, basic and changing skills
- Intangible value added
- Service and complex product innovation
- E-commerce, e-business, e-education, e-government…

INSUFFICIENT ICT IS A MAJOR COMPETITIVE HANDICAP
A ROLE FOR GOVERNMENTS

Provide the BEST possible context for the economy to take FULL advantage of the potential of the ICT paradigm

PROMOTE BROAD CONSENSUS FOR BOLD AND ADEQUATE ICT POLICIES AND REGULATION
PROVIDERS OF ICT SERVICES AND INFRASTRUCTURE

BALANCING THE PUBLIC INTEREST AND PRIVATE PROFITABILITY

ALL SECTORS OF THE ECONOMY AND CONSUMERS

An ICT infrastructure to maximize use volume user density, use capability and competitiveness

• Maximum quality and coverage
• Globally competitive prices (the lower the better!)
• Maximum reliability and security

PUBLIC POLICY

Context for healthy competitive ICT companies with optimum sector architecture:

• Favouring sufficient profit for growth, expansion and maintenance
• With enough incentive for research, innovation and constant response to user needs

PUBLIC POLICY

PROVIDERS OF ICT SERVICES AND INFRASTRUCTURE
For the next two decades, at least:

INFORMATION AND TELECOMMUNICATION INDUSTRIES AND SERVICES are NOT just an important industry

THEY ARE THE KEY TO THE COMPETITIVENESS of any company of any country, of any region

THE SHAPE OF THE ICT INFRASTRUCTURE IS THE SHAPE OF THE FUTURE