The Roles of State and Markets in shaping a sustainable Global Golden Age

A view from technology and history

Professor Carlota Perez

Universities of Cambridge, Tallinn and Sussex

THE ROLES OF MARKETS AND STATES IN SHAPING A SUSTAINABLE GLOBAL GOLDEN AGE

A view from technology and history

Prof. Carlota Perez

Universities of Cambridge, Tallinn and Sussex
Author of *Technological Revolutions and Financial Capital: the Dynamics of Bubbles and Golden Ages*

Public Services Summit 2008
City of Stockholm and CISCO
December 8-10, 2008

Is global growth environmentally sustainable ?

Is full globalization compatible with consumerism?

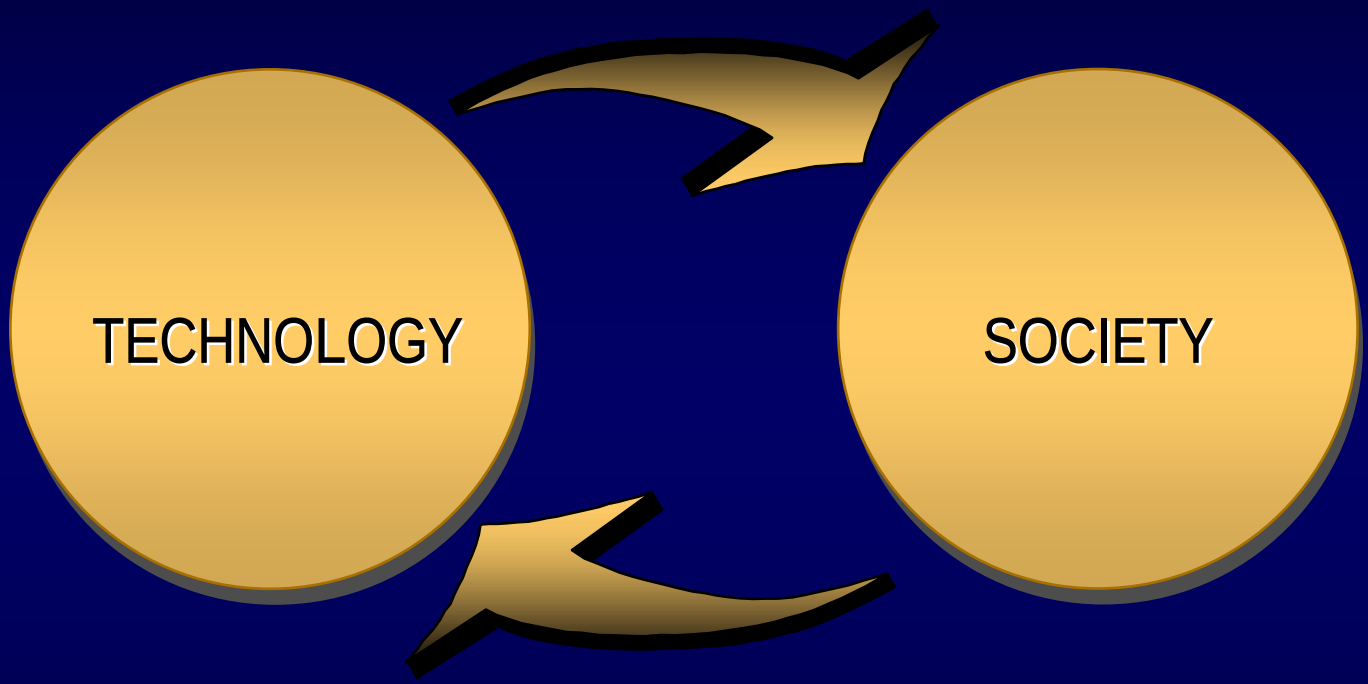
Why do so many people around the world think that the so-called “American way of life” is the best?

Could there be better?

Is ICT part of the problem or part of the solution?

UNDERSTANDING
TECHNOLOGICAL REVOLUTIONS
AND PARADIGM SHIFTS
CAN HELP ANSWER THOSE QUESTIONS

A crucial relationship to examine



The historical analysis reveals
a process of mutual shaping
in a periodically changing context

FIVE TECHNOLOGICAL REVOLUTIONS IN 240 YEARS

Each begins in a core country…

Britain	1771	The ‘Industrial Revolution’ (machines, factories and canals)
Britain	1829	Age of Steam, Coal, Iron and Railways
Britain USA Germany	1875	Age of Steel and Heavy Engineering (electrical, chemical, civil, naval)
USA	1908	Age of the Automobile, Oil, Petrochemicals and Mass Production
USA	1971	Age of Information Technology and Telecommunications
USA? Europe? Both? Other?	200??	Age of Biotech, Bioelectronics, Nanotech and new materials?

Each takes 40-60 years to spread across the world and reach maturity

Why call them revolutions?
Because they transform the whole economy!

NEW INDUSTRIES and NEW PARADIGM FOR ALL

A powerful cluster of visible new and dynamic industries and infrastructures

New generic technologies, infrastructures and organizational principles capable of modernizing the existing industries too

Explosive growth and structural change

A quantum jump in innovation and productivity potential for all

A massive change in the direction of change

TRANSFORMING THE OPPORTUNITY SPACE AND THE WAYS OF LIVING, WORKING AND COMMUNICATING

Each technological revolution provides a new inter-related set of life-shaping goods and services at 'affordable' prices

Age of Steam, Coal, iron and railways	**VICTORIAN LIVING**	The British 'middle classes' established an industry-based **urban** lifestyle, different from that of the country-based aristocracy. It then spread to the new upper classes elsewhere
Age of Steel and Heavy Engineering First Globalization	**THE BELLE EPOQUE**	British, European and American upper and middle classes established a **cosmopolitan** lifestyle which spread to the upper classes of the world
Age of the Automobile, Oil, Petrochemicals and Mass Production	**THE AMERICAN WAY OF LIFE**	American upper and middle classes established a **suburban** energy-intensive lifestyle that spread to the working classes of the advanced countries and to the middle classes of the developing world
Age of Information Technology and Telecommunications	**SUSTAINABLE GLOBAL LIFESTYLES???**	Will the affluent educated classes of the developed and emerging countries establish an ICT-intensive knowledge society with a variety of environmentally friendly lifestyles and consumption patterns???

Each new style becomes the embodiment of progress and comfort shaping the "good-life" desires and dreams of the majority

The emergence of the 'American Way of Life' as the paradigm shift from the Belle Époque…

FROM ENERGY-SCARCE LIVING Energy is expensive and often inaccessible	TO ENERGY-INTENSIVE HOMES AND MOBILITY Energy is cheap and its availability unlimited
Trains, horses, carriages, stage coaches, ships and bicycles	Automobiles, buses, trucks, airplanes and motorcycles
Local newspapers, posters, theaters, parties	Mass media, radio, movies and television
Ice boxes and coal stoves	Refrigerators and central heating
Doing housework by hand	Doing housework with electrical equipment
Natural materials (cotton, wool, leather, silk..)	Synthetic materials
Paper, cardboard, wood and glass packaging	Preference for disposable plastics of all sorts
Fresh food bought daily from specialized suppliers	Refrigerated, frozen or preserved food bought periodically in supermarkets
Urban or country living and working	Suburban living separate from work

…all strongly aided by advertising, business strategies and government policies

THE CURRENT TECNO-ECONOMIC PARADIGM SHIFT beginning in the 1970s

FROM THE LOGIC	TO THE LOGIC
OF CHEAP ENERGY (oil) for transport, electricity, synthetic materials, etc.	OF CHEAP INFORMATION its processing transmission and productive use
Excessive use of energy, materials and tangible products	Huge potential for savings in energy and materials Preference for intangible value
High volume of identical products within national economies	Diversity and adaptability of a wide product range across the global economy

Each paradigm opens different new routes for making profits as well as for achieving socially desirable goals

THE POTENTIAL PARADIGM SHIFT IN PRODUCTION PROCESS INNOVATION

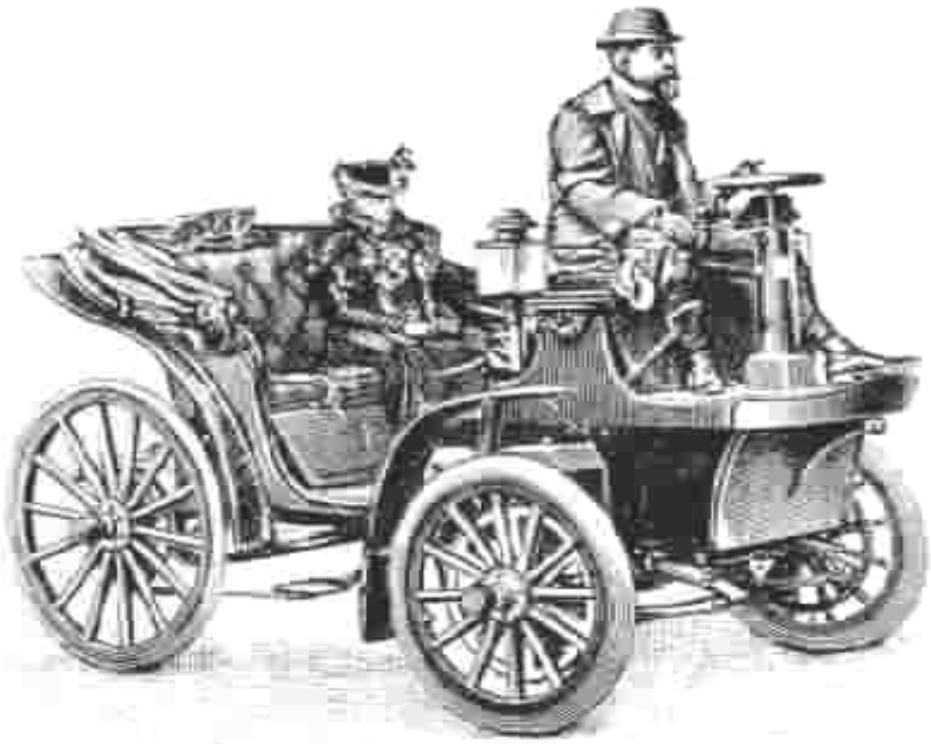
Activity	Practices enabled by ICT
FABRICATION INDUSTRIES	Minimum energy and materials use; custom designed materials Zero defects, zero resource waste. Design for low energy use in operation. Planned upgradeability (not obsolescence), disassembly, recycling
PROCESS INDUSTRIES	Energy saving and “intelligent” process controls. Low energy processes By-products seen as source of value: trend toward closed-loop systems Custom-made materials; development of nanotechnology and biotech
PRODUCT PROFILE	More services than tangible products (pleasure in quality leisure; not in objects) Very high quality products, smaller, multi-purpose, durable Widely differentiated range by style of living (equivalent satisfaction)
PERSONAL TRANSPORT	Information-based variety of means, revaluing of time, flexibility of location Innovation in individual and collective transport. Automobile as last resort
FREIGHT TRANSPORT	Full awareness of environmental impact (and full costing) Optimizing of routes by bulk and weight. Innovation in vehicles Innovation in packaging and distribution
ENERGY	Variety of sources, local diversity, interactive users. Conservation Combined heat and power; intelligent controls in home and office
URBAN DEVELOPMENT	Integrated cities: living, work, education and leisure Full connectivity for multiple activities. Transport avoiding design Environmentally intelligent buildings

The extent of realization of the potential will depend on the policy context

YET, THE NEW PARADIGM IS STILL WRAPPED IN THE OLD

Mass production disposability and high use of energy and materials are still with us

It's just like the first automobiles
that began looking like horse driven carriages



An automobile in 1898

Reproduction: L.De Vries. 1972

WHY? Because **in the crucial** 1990s we had cheap oil and cheap Asian labor which favoured the stretching of the old marketing and consumption patterns

BUT TO CONTINUE ON THIS ROUTE WE WOULD NEED SEVEN PLANETS!

WILL THE NEW PARADIGM PREVAIL?

YES

If economic circumstances change

If it becomes an aspiration of the majorities

If it is a positive sum game between business and society

Sustainability must…

“create economic opportunities and improve the quality of life”

President Bill Clinton
CUD 2008 Conference, San Francisco

Quality of life is measured by fulfilment of values and aspirations

Those aspirations are historically determined by the way society shapes each successive technological potential

The "luxury" life: values and aspirations UNDER THE MASS PRODUCTION PARADIGM

- Brand new is better than old
- Bigger is better than smaller
- More is better than less
- Synthetic is better than natural
- Fabricated is better than hand-made
- Disposable is comfortable
- Leisure is rest (not exercise)
- Shopping is a leisure activity
- If you don't keep up with the Jones', you are falling behind

ENABLERS

- Low cost of products
- Consumer credit
- Unemployment insurance
- Official trade unions
- Savings and loan banks
- Low cost housing
- Public education and health

OPINION SHAPERS

- Role models
- Advertising
- Movies, TV
- Relative prices
- Marketing strategies

The shift to “ICT-green” consumption patterns is possible
NOT BY GUILT AND FEAR
BUT BY DESIRE AND ASPIRATION

Through shaping and enabling
a change in our notions of luxury and the “good life”

BUT IT MUST HAPPEN FIRST AND VISIBLY IN THE ADVANCED COUNTRIES

The notions of luxury and good taste emerge at the top of the income scale and spread by imitation

PART OF THE PARADIGM SHIFT IS ALREADY HAPPENING

- Small is better than big
- Natural materials are better than synthetic
- Multipurpose is better than single function
- ‘Gourmet’ food is better than standard
- Fresh organic fruit and vegetables are healthier
- Exercise is important for well being
- Global warming is a real danger
- Not commuting to work is possible and preferable
- Solar power is luxurious
- Internet communications, shopping, learning and entertainment are better than the old ways , etc.

BUT RELATIVE PRICES AND WIDER INTERESTS HAVE TO FOLLOW! WILL THEY?

THE UNAVOIDABLE PATH OF THE CURRENT GLOBALIZATION PATTERN

Rising prices of oil and raw materials

Rising packaging and freight costs

Visible effects of increasing global warming

Rising climatic risk

CHANGE IN THE ECONOMICS OF THE PRODUCTION, TRANSPORT AND DISTRIBUTION OF TANGIBLE GOODS

CHANGE IN BUSINESS STRATEGIES

CHANGE IN GOVERNMENT POLICIES

Massive relocation and geographic re-specialization of physical production into optimal local, regional and global networks

Gradual redesign of the consumption patterns for the “good life”

UTOPIAN OR REALISTIC?

It sounded utopian to say

in mid-1930s DEPRESSION:

Blue collar workers will have lifetime jobs and fully equipped suburban houses with a car at the door

Most colonies will gain independence

But it was realistic:

Increasing wages created many more millions of consumers for mass production and sustained growth

Rising middle classes in the developing world adopted the "American Way of Life" widening world markets for mass production

...or in the late 1960s:

Some of the values of the hippie movement [back to natural materials, organic food, etc.] **will become the luxury norms**

Innovations in natural textile fibres have transformed the world of fashion

Innovation in distribution logistics have made organic foods the premium segment in supermarkets

Shifts in consumption patterns shift profit-making opportunities

A SUSTAINABLE DEVELOPMENT PATH for a positive-sum global future benefitting both business and the populations of developed, emerging and developing countries IS POSSIBLE

- Innovations in energy, environmental sustainability and transport open vast opportunities for growth and employment in the developed world

- Globalization across all continents opens the possibility of extensive rather than intensive market growth (not planned obsolescence for the same customers but durable products for more and more customers)

BUT IT WILL NOT HAPPEN AUTOMATICALLY

Even with the likely price changes,
uncertainty would refrain investment

THE MARKET CANNOT DO IT ALONE

WE ARE PRECISELY
AT THE HISTORICAL MOMENT

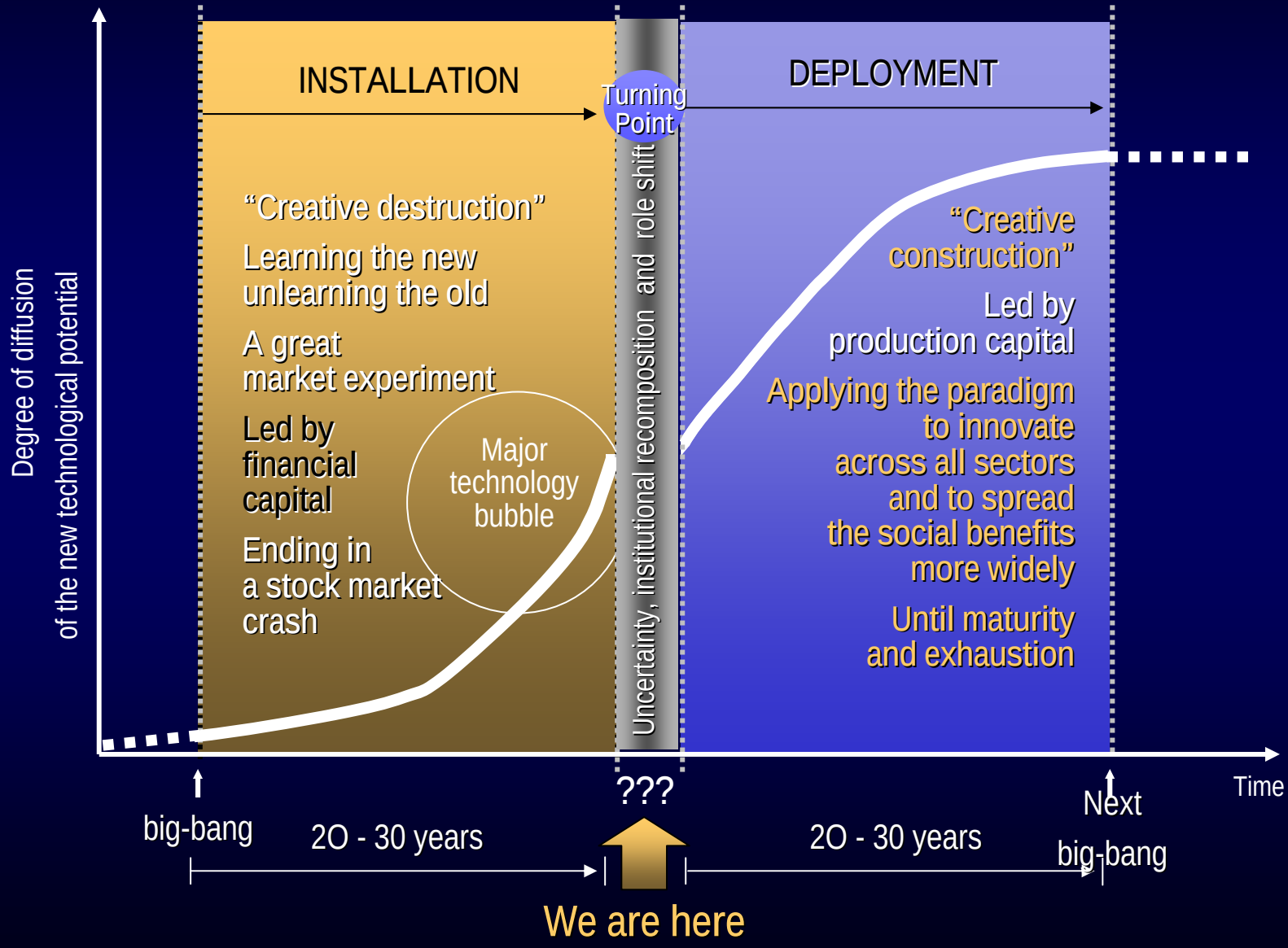
WHEN THE STATE
MUST COME BACK INTO THE PICTURE

To understand this statement
we must look into

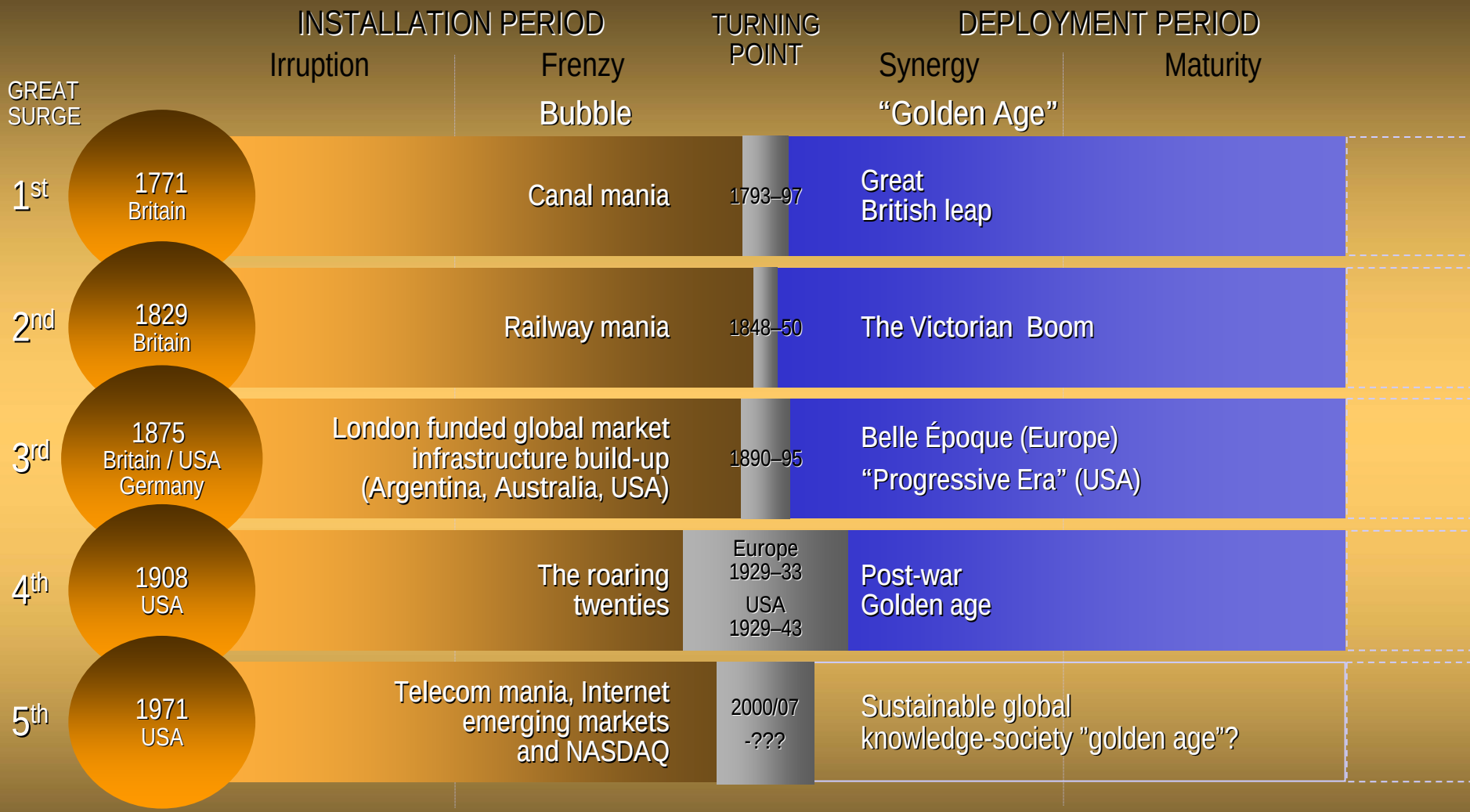
HOW TECHNOLOGIES PROPAGATE

EACH TECHNOLOGICAL REVOLUTION PROPAGATES IN TWO DIFFERENT PERIODS

The first half sets up the infrastructure and lets the markets pick the winners
the second half reaps the full economic and social potential

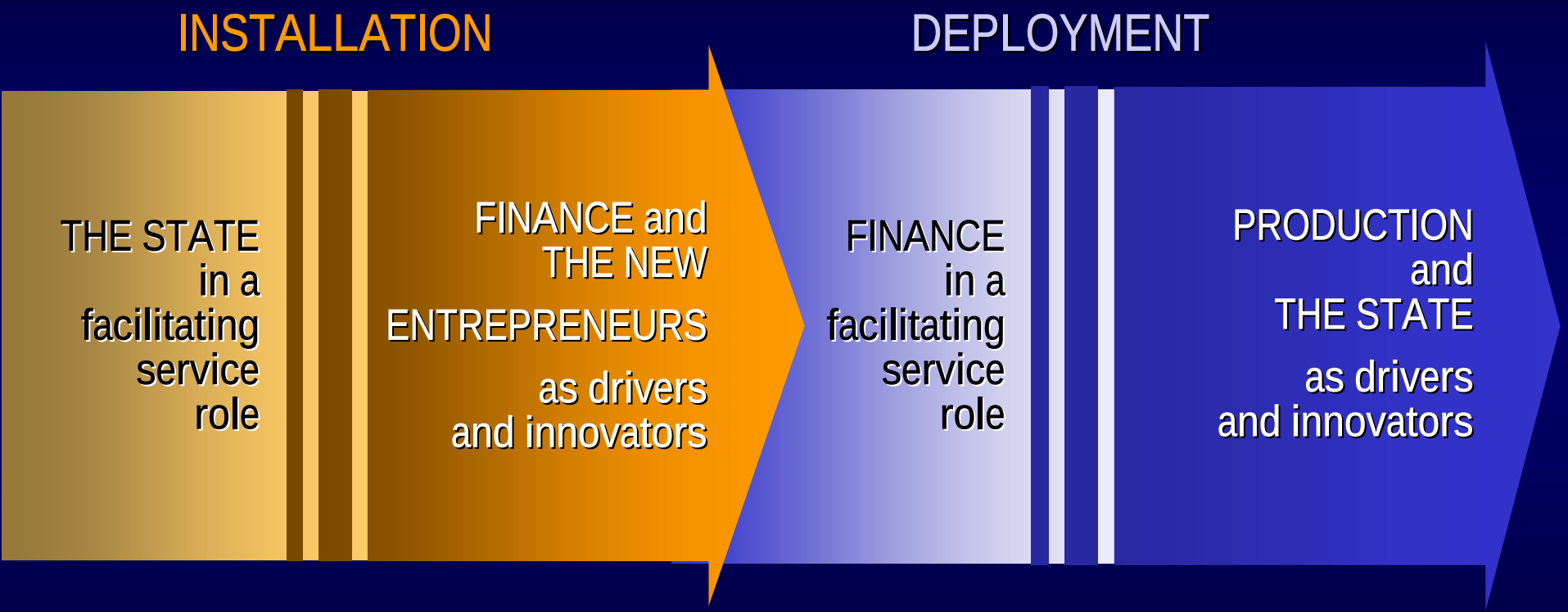


The historical record: bubble prosperities, recessions and golden ages



The Golden Ages follow the big financial collapses, facilitated by enabling regulation and policies for shaping and widening markets

Different periods: different roles for the agents



The major financial collapse marks the end of Installation
and institutional innovation steers financial markets
towards investing in the real economy to maximise growth and job creation

John Chambers, Cisco CEO
CUD 2008 Conference, San Francisco

"It is important to have supportive government. We must all collaborate to paint a vision and realize a new architecture…

I wouldn't have said this ten years ago…"

The pure market ideology has already played its role in the installation of the ICT paradigm.

THE TIME IS RIPE FOR THE STATE
TO COME BACK INTELLIGENTLY
at all levels, nationally, regionally, globally
and --especially– locally!

IN COLLABORATION WITH
- Business
- Civil society (NGOs)
- Universities and
- Media

MUCH INSTITUTIONAL INNOVATION IS NOW NEEDED TO GUIDE THE ECONOMY TO STABLE AND PEACEFUL GROWTH

- Regulating and restructuring
  the national and global financial architectures
- Shifting market conditions towards financing the real economy
  (away from the casino-mode)
- Tilting the playing field
  in favour of environmentally friendly investment and innovation
- Enable the education intensity, coverage and variety
  required for the Knowledge Society
- Reinventing the Welfare State for the current paradigm conditions
- Establishing anti-poverty measures
  and fostering investment within and across countries
  (for expansive –rather than intensive– demand growth)

PLUS DEVELOPING METHODS OF CONSENSUS BUILDING
TO CARRY THE CHANGE SUCCESSFULLY THROUGH

The answer to whether sustainable global growth is feasible is, therefore, YES!

But neither pure “free markets”
nor simple “environmentalism”
will get us there

The innovation potential of the ICT paradigm
can and must be collectively redirected
towards new patterns
of environmentally friendly well being for all
and a new profit-making dynamic for business

AND THE TIME TO ACT IS NOW!

THANK YOU!