

II Jornada Nacional de Innovación y Competitividad

***La Importancia de la Innovación
para el
Desarrollo Económico***

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Morelos
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Structure

- Set the context of innovation for development, including some systemic aspects
- Identify the key areas for action
- Look in particular at
 - R&D performers and Universities
 - Linking institutions and strategies
 - Firms and the productive economy
 - Key tools for upgrading



First some simple definitions

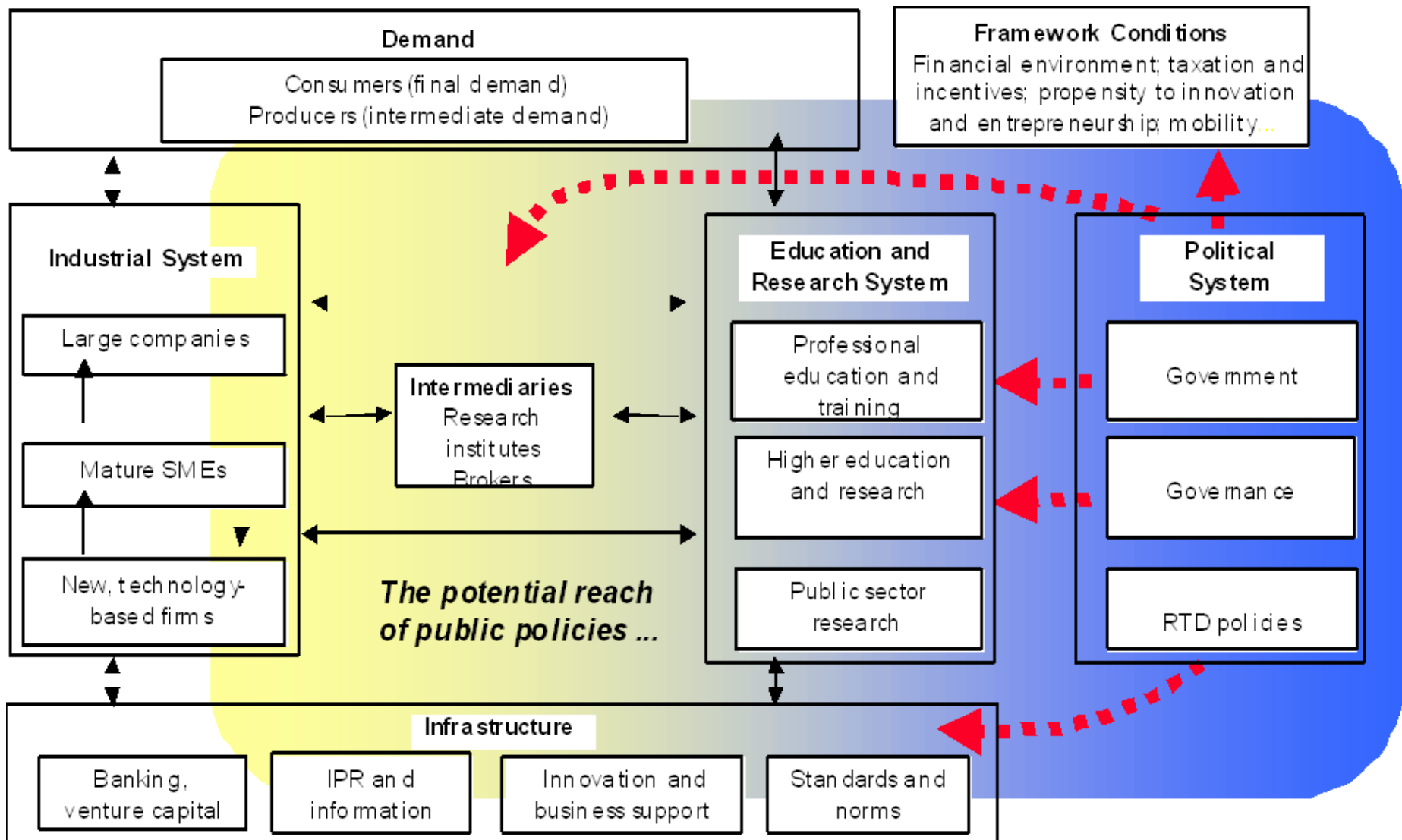
- Technology – is how we do things now
- Knowledge – is what we already know
- Innovation – is doing things differently
- Science – is one of the main drivers of innovation
- Development – is how we apply science to do useful things
- Research – is what we do to find out what we currently do not know



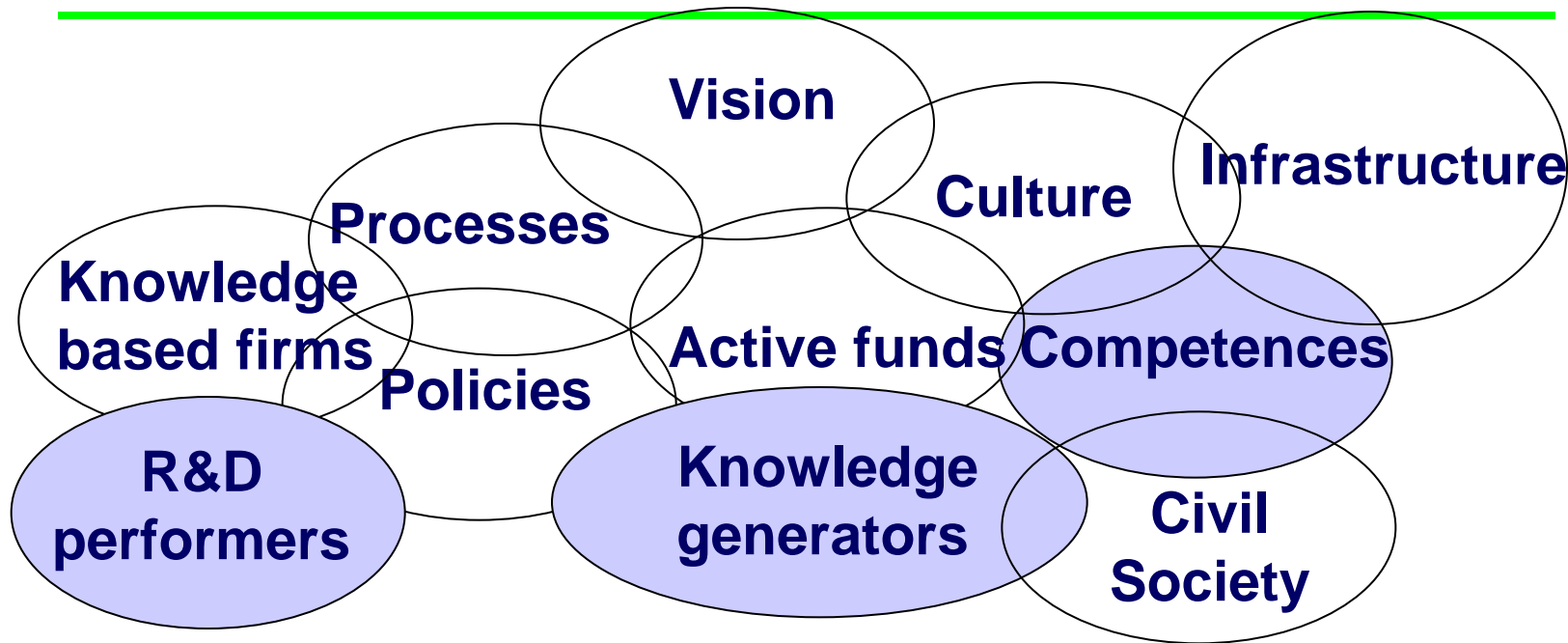
Then some simple propositions

- Competitiveness is crucial – improving it is essential
- The middle is not a comfortable place to be
- Innovation is key to improving competitiveness
- Regional variation increases the challenge
- And is usually persistent and reasonably stable
- Perspectives have to be long term and visions shared

Typical National Innovation System From Nelson



Interaction between research and innovation!



SHARING OVERLAPPING INTERACTING

INTER-DEPENDENT MULTIDIRECTIONAL

COMPOST HEAP



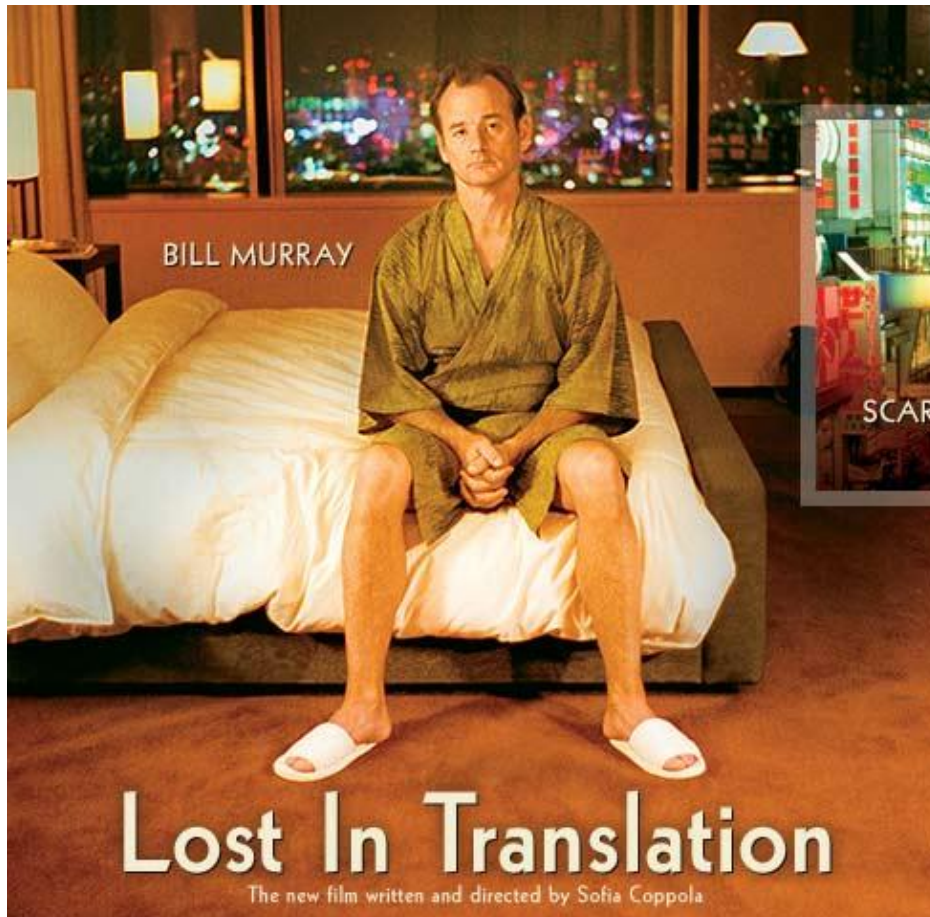
Alternate regional strategies

- Normalising – pushing the laggards, constraining the leading
- Realising the potential, changing the culture
- Upgrading the infrastructure – Necessary? Sufficient?
- Stressing the interaction – joining to create value
- Selectivity and choices – necessary and difficult
- Management, differentiation and quality

Critical success factors

CULTURAL DIFFERENCES MATTER

Require understanding
and
effort to modify



University of Cambridge – Ivory Tower?

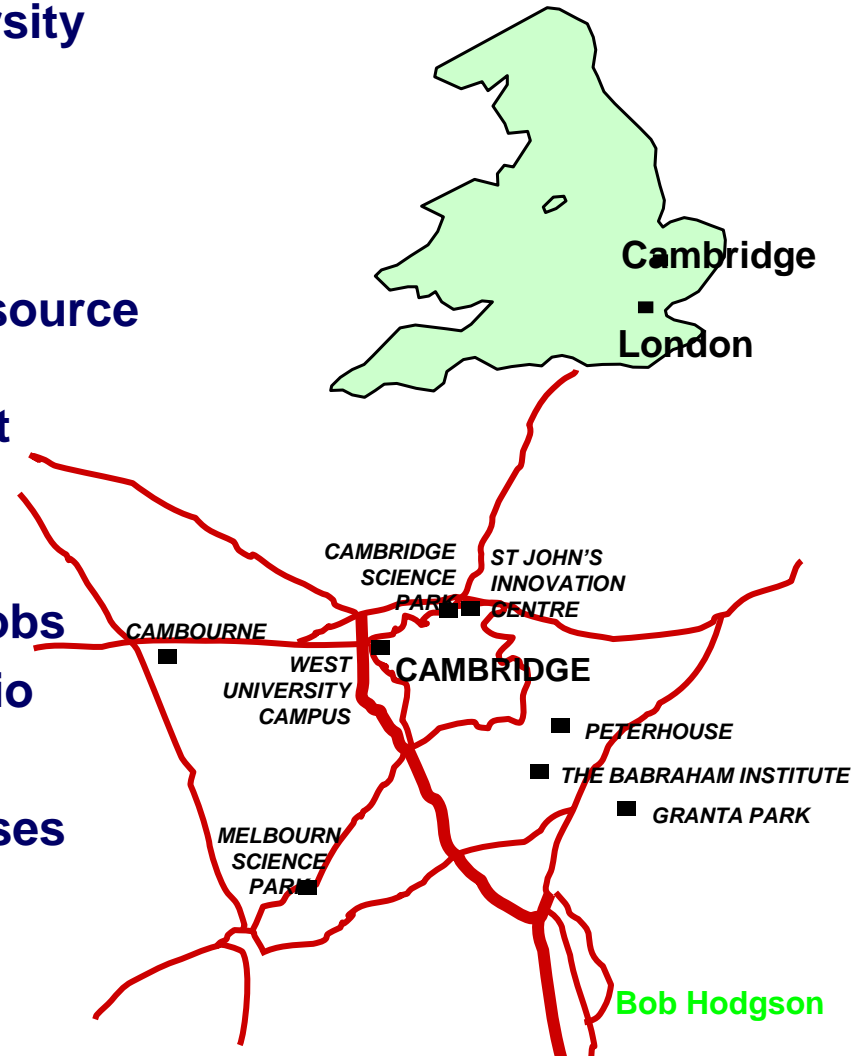


- A research based university
- Excellence in culture
- Ranked 2nd globally
- Started in 13th century
- Successful and adaptive – yes
- Slim and agile – perhaps not!



Example region – Cambridge, England

- Elite and wealthy research University started in 13th century
- Lots of engineering and sciences
- Alumni remain, so rich people resource
- Strong resistance to development
- Business
 - 1,300 firms, creating 35,000 jobs
 - high tech sectors – CAD to Bio
 - 80 start-ups per annum
 - businesses creating businesses
 - specialist service periphery



Bob Hodgson

Universities: the traditional model challenged



Humbolt Dual mission: scholarship/research and teaching

Financial dependence:

- public budgets
- charitable donations, and more recently
- earnings!!!

Broadening challenges to core purpose:

- Library and knowledge access?
- Mass participation or elite institution?
- Speed of knowledge development?
- Globalisation and business orientation?

SO A NEW MODEL – technology transfer a key element



The four commercialisation routes

- Establishing IP and then commercialising it
- Creating new businesses from knowledge base
- Establishing strategic alliances
- Faculty in advisory roles with business

AND OF COURSE

TRANSFERRING THROUGH TRAINING

Cambridge University: strategic alliances



Microsoft



Glaxo



**SmithKline
Beecham**

SEIKO



HITACHI



Aventis > Hoechst

Marconi



Strategies to build legitimacy

From enabling to requirement:

- Bayh-Dole act in USA
- Competitive third leg funding in UK
- Consortia requirement of EU Framework
- Voluntarism of OTRI approach and Foundations
- CONNECT programme from UC San Diego
- Legal duty in Norway

Important steps to bring TT into mainstream



IP rights and commercialisation

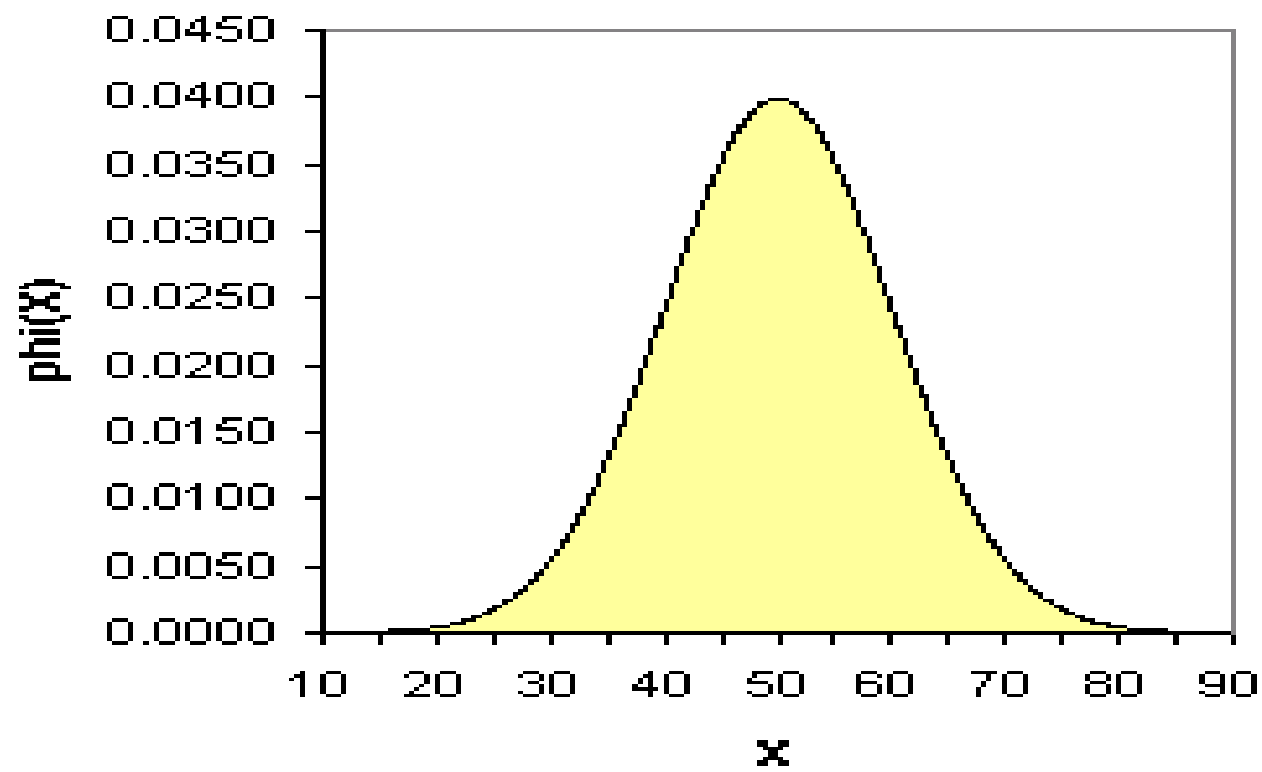
- Protecting the Right
 - laws and practice – essential but not sufficient
 - publish but protect – timing and management
- Whose is it anyway?
 - legal default – owned by employer
 - practical reality – shared with investor and inventor
- Creating the Wealth
 - accidents and scale – active commercial management essential
 - licence or new business – different demands



Managing the culture change

- Academics are normal – but need managing
 - Respecting the outliers and moving the mean

- Providing the environment - My door is open:
why don't they come
 - Formal protocol
 - Ferrets and guerrillas
 - Research team leadership
 - built into core purpose
 - linked to reward and status
 - sustained into future programmes





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Bridging or translation institutions

Linking technology and business

- OTRI model – industrial liaison, reactive style
- CONNECT model – university as contributing agent
- Competence Centre approach – Taguspark, Portugal
- Network development – inside and outside, EMSEN
- Region wide – Oslo technopole



International partnerships, Portugal

- The explicit incentive – and the implicit goals
- Established through FCT
- Prestige institutions – in narrowly defined fields
 - MIT
 - Carnegie Mellon
 - UT, Austin – COLAB
 - Fraunhofer
- And University Technology Enterprise Network
 - With IC² of UT,Austin
 - Working across the partnerships



Turkish universities

- Istanbul Technical University – building on alumni
- Bilkent University, Ankara – a business based model
- Hattchetepe University – engineering partners
- Middle East Technical University – creating a technology park



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 - Firms and the productive economy
 - Key tools for upgrading
- Finally, some systemic aspects



Changing the competitiveness of firms

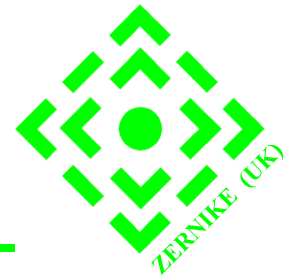
- Working with existing firms
- Creating new firms
- Attracting firms from outside
- Linking local firms externally



Directions of travel in technology assistance

- Public service to partnership
- Push to pull
- Technical to integrative
- Single to multiple

Long term horizons apply



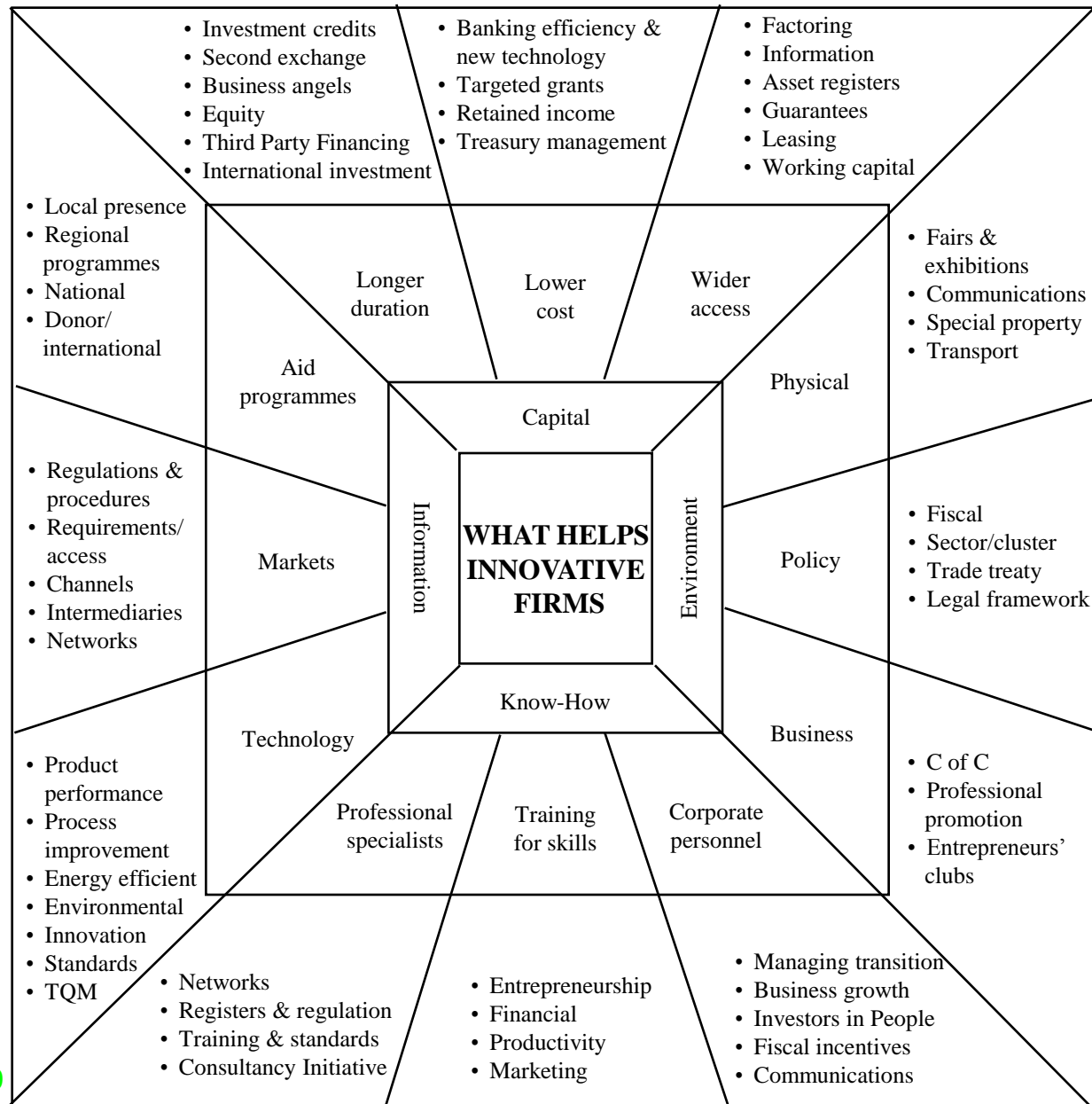
Companies and the demand side - the start

***What do firms
need?***

ACTIVE TOOLS

- **Capital – seed and venture especially**
- **Know how - available developable and excellent**
- **Information – on markets, technologies and assistance**
- **Infrastructure – hard, soft and cultural**

With initiatives to help in each area





Legitimate but different objectives: Chile

- The missionary service
 - Target all SMEs in neutral approach
- The focussed provision
 - Assist firms interested in innovation and technology
- The leading edge stimulation
 - Accelerate adoption and development of world class technology in priority clusters



Programme content: the missionary

➤ **Objective**

- Develop awareness of innovation and technology as a key competitive strategy for all businesses

➤ **Activities**

- Promote the concept and raise awareness
- Offer grant assistance for early adopters
- Actively seek clients across the spectrum and regions
- Develop standard methodologies for mass adoption
- Train and accredit a cadre of implementation agents
- Publicise success – to foster wider adoption

➤ **Outcomes**

- Improved competitiveness across the board



Programme content: the focussed provider

➤ **Objective**

- To assist companies already aware of need to upgrade technology but uncertain of how to do it

➤ **Activities**

- Publicise offer of help and request bids
- Offer a tailored service with help from (accredited) specialists
- Assist with costs through shared cost scheme
- Develop alumni, clubs and networks to foster mutual support
- Seed collaborative approaches
- Promote successful practice

➤ **Outcomes**

- Assist firms to increase own competitiveness and encourage cooperative behaviour through mutual interest groups



Programme content: the leading edge

- **Objective**
 - To develop sustained world class technology development capability in priority clusters

- **Activities**
 - Build on consortia to create substantial research institutes
 - Create significant institutions with key technology competences
 - Develop partnership working and business participation
 - Fund longer horizon R&D in emerging technologies
 - Ensure business ownership and direction

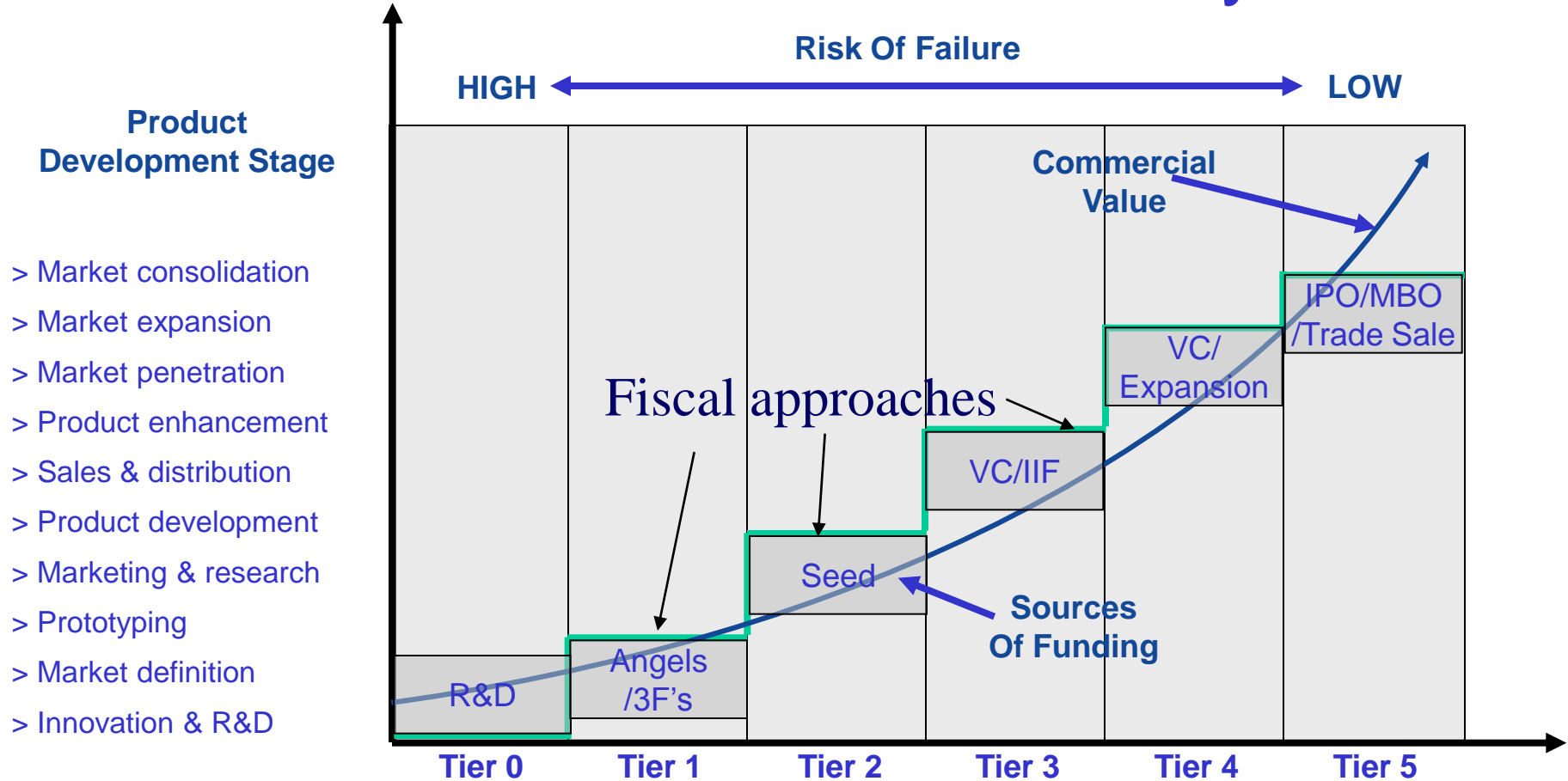
- **Outcomes**
 - World class technologies developed domestically tailored to Chilean cluster priority needs owned and run by private led institutions



New technology based firms, and finance

- Growing your own – rooted and relevant
- Creating the culture, building the history
- Incubation as a process, commercialisation as a challenge
- Venture capital in all its forms

The Commercialisation Cycle



Business Development Tiers

Tiers 0/1 - Pre-incubation

- Direction
- Collaboration
- Guidance
- Resources etc
- Pre-Seed funding

Tier 2 - Incubation

- Mentoring
- Seed funding
- Contacts
- Consulting
- Clients

Tier 3 - Post-incubation

- Funding
- Structuring
- Relationships etc

Tiers 4/5 - Commercial Maturity



Three hypotheses

- Lots of ideas BUT no risk capital
 - So lets build a VC industry

- Lots of money BUT no ideas
 - so lets change the science base

- Lots of money AND lots of ideas BUT cannot talk to each other
 - So develop interaction language and culture

- Capital finds ideas it does not generate them

Critical success factors



Keep communicating
Even when they seem not to listen



Attracting mobile technology investment: FDI

- A well used strategy
- Where technology embodied in capital goods
- migrates to low cost labour economies

- How to attract more and reduce vulnerabilities?
- How to maximise the benefits?

- Markets Infrastructure Skills and Incentives



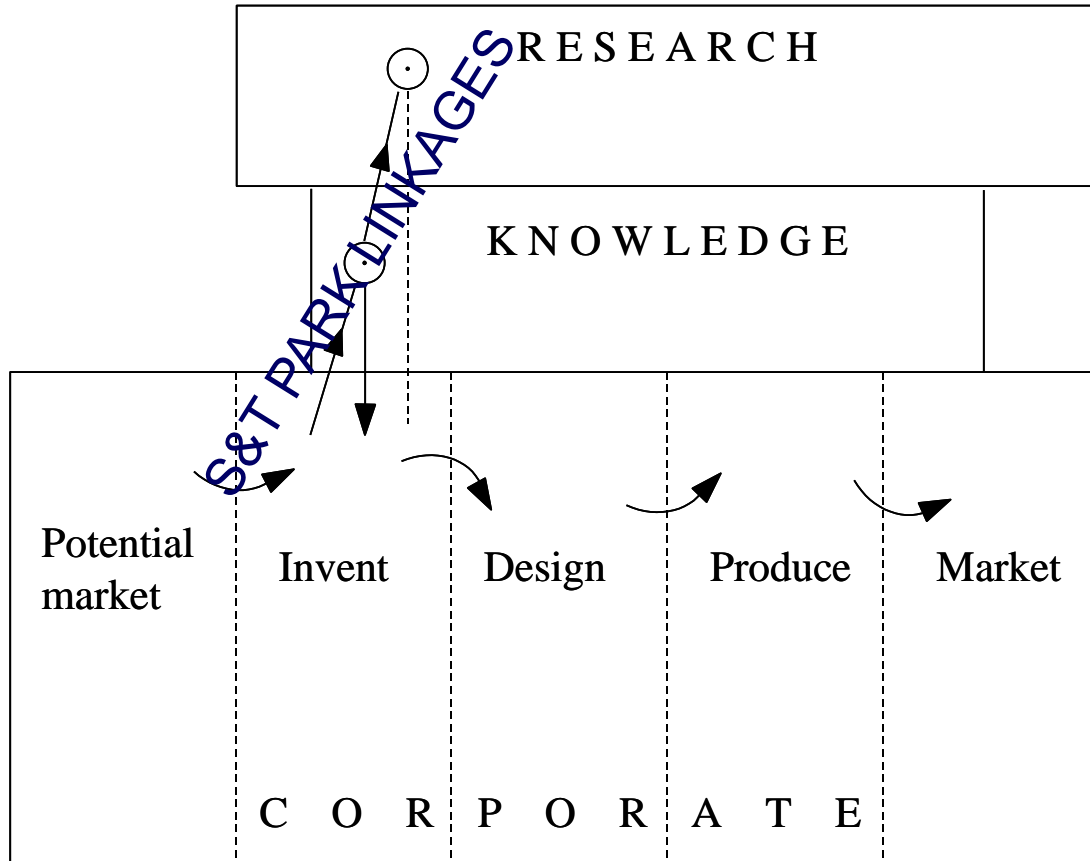
Technology zones / Technoparks / S&T Parks

- Provide for their occupants
 - infrastructure – to meet their accommodation needs
 - incentives – to accelerate their development
 - soft support – to reduce their costs
 - culture – to stimulate the knowledge economy
- Visibility to their partners in the knowledge economy
- Networks and connections to other partners

Cambridge Science Park



Typical model: Kline-Rosenberg (1986)



S&T parks seek to improve the knowledge flow between the parties

TUBITAK Marmara: Technology Park



- Adjacent to main research facility
- Status of Free Zone with incentives
- Security and administrative limits
- Property package with right balance

BUT

- Across the road a Technology Zone
- Similar incentives different law
- Same management team
- Fewer restrictions on movement



The IASP Science Park definition

Science & Technology Parks promote the economic development and competitiveness of regions and cities by:

- Creating new **business opportunities** and adding value to mature companies
- Fostering entrepreneurship and **incubating** new innovative companies
- Generating knowledge-based **jobs**
- Building **attractive spaces** for the emerging knowledge workers
- Enhancing the **synergy** between universities and companies.

CONCEPTUAL MASTER PLAN OF HI-TECH PARK



INTEGRATED COMPONENTS

- service hub in flagship building
 - Universities
 - Incubator
 - Exhibition and conference space
- R&D Zone
- Communication and Call Centre Zone
- High Tech Manufacturing and Assembly Cluster
- Business and Commercial District
- Bonded Road Access to Airport Free Zone / Logistics Park

Zamudia Technology Park, Pays Vasco Spain





Pays Vasco regional regeneration strategy

- Culture and innovation – two pillars
- Selectivity and cohesion
 - Metropoli 30
 - Biotechnology as flagship cluster
- Approach to technology upgrading
 - Research
 - Inward attraction
 - Infrastructure
 - Incubation
- Industrial research institutes and networks

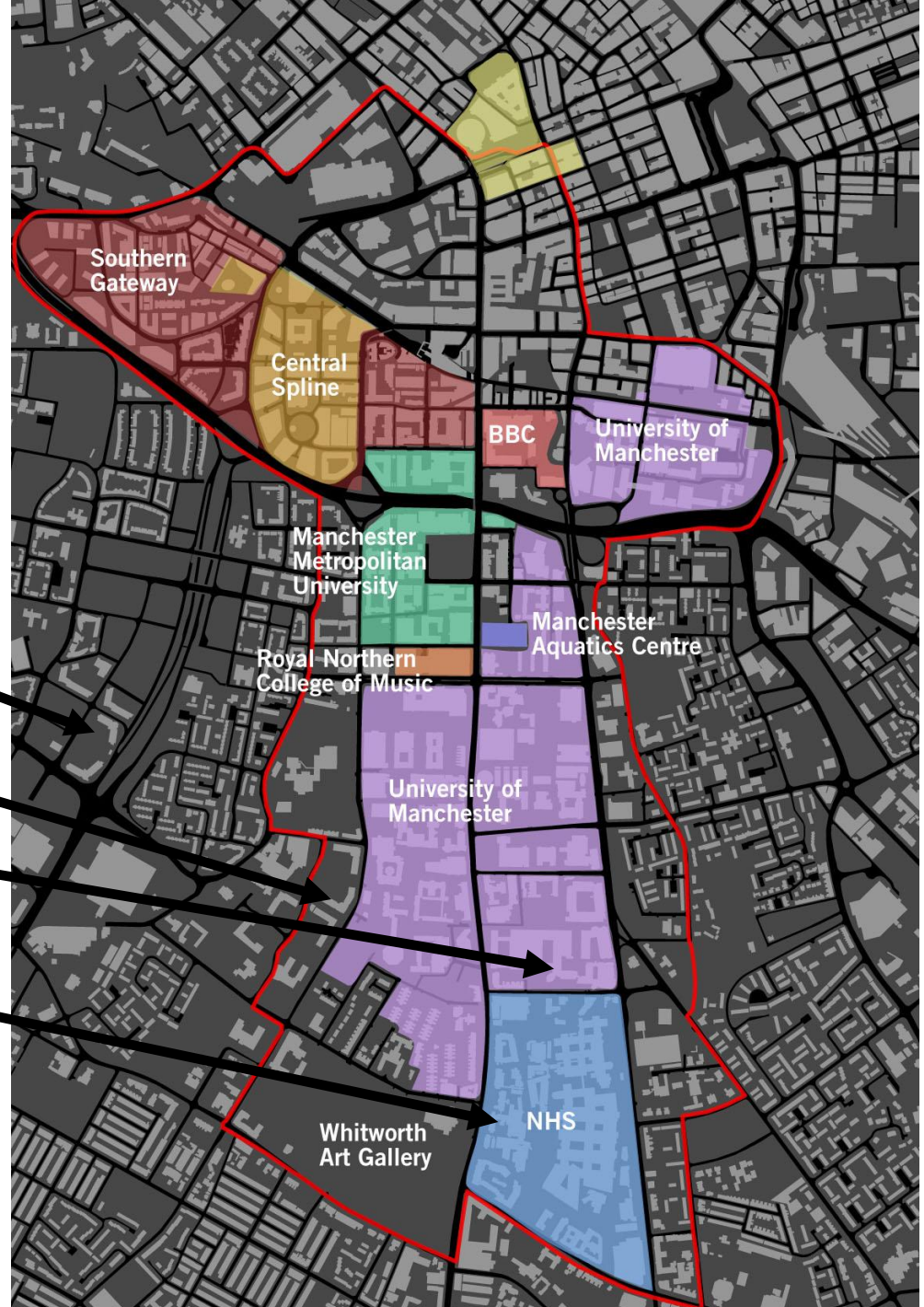
The Corridor, Manchester

Manchester Technology Park

Manchester Science Park

Manchester Bio Incubator

Medi linked building





Skills and competitiveness

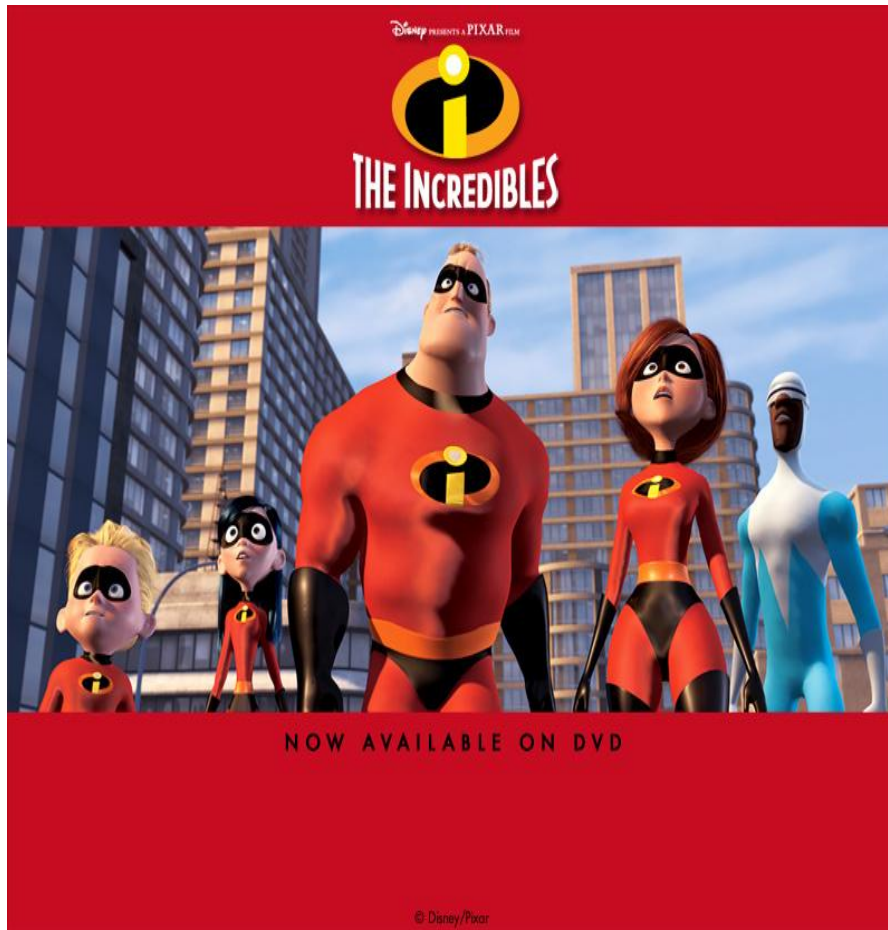
- The essential national competitive resource
- Develop evolutionary strategies
- Look to Singapore as a benchmark
- Identify where it is working and build
- Encourage sticky people



Two main themes: Mexican State's Innovation Plan

- SELECTIVITY – focus where there is already some strength
 - Jalisco – specific aspects of ICT
 - but – isolated initiative of driver group
 - no shared or inclusive vision
- ARTICULATION – align and join up efforts of all agents
 - Guanajuato – a strong administrative culture
 - with academic underpinning
 - emphasis on defining collaborative processes
 - not yet addressed content
- *success requires both to be covered*

Critical success factors



being super can be the problem
and the solution

Thank You



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