Learning from RALIS experiences from local, sectoral and territorial perspectives

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There is all sorts of innovation

- Technological innovation is only one field of innovation
  - there is also art, music, architecture
  - there is also social innovation, for instance
    - democracy
    - NGOs playing an increasing role in society
    - network governance
- There is also innovation in business models
  - sometimes independent of technological innovation, e.g. Ikea, Aldi, WalMart
  - sometimes as a result of technological innovation, e.g. Ebay, Amazon

Why focussing at innovation in the business sector?

- The business sector includes agriculture, mining, manufacturing and services
- Innovation in the business sector is the main driver of competitiveness
- Innovation in the business sector is directly related to growth and prosperity

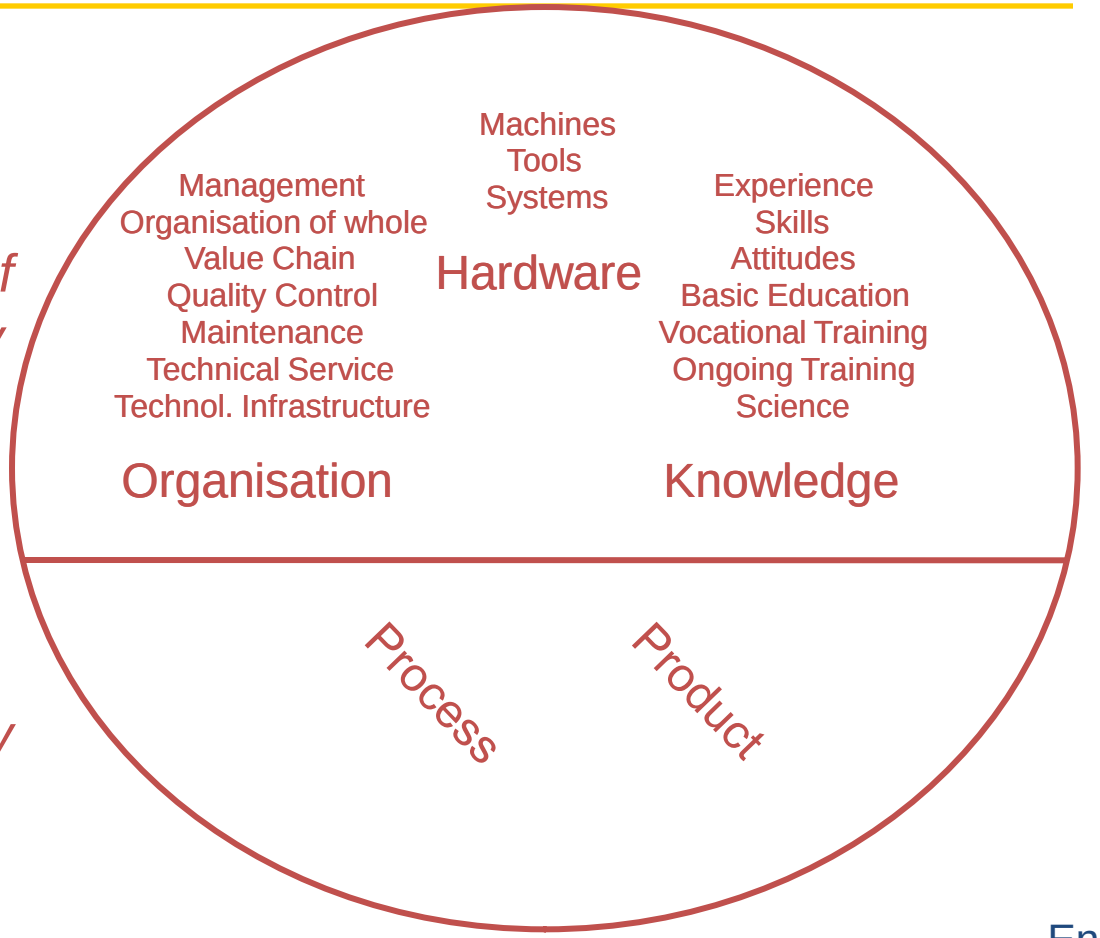
What is the relationship between innovation and technology?

- Innovation emphasises the difference
  - something is new, different, and better than before
- Technology emphasises action
  - process technology: the arrangements needed to produce something
  - product technology: the elements involved in using something
- Technical change, based on technological learning, is one very important element of innovation
- Process innovation increases productivity and thus prosperity
- Product innovation generates new businesses and sectors, and thus growth, income, and jobs

What is technology?
A broad definition

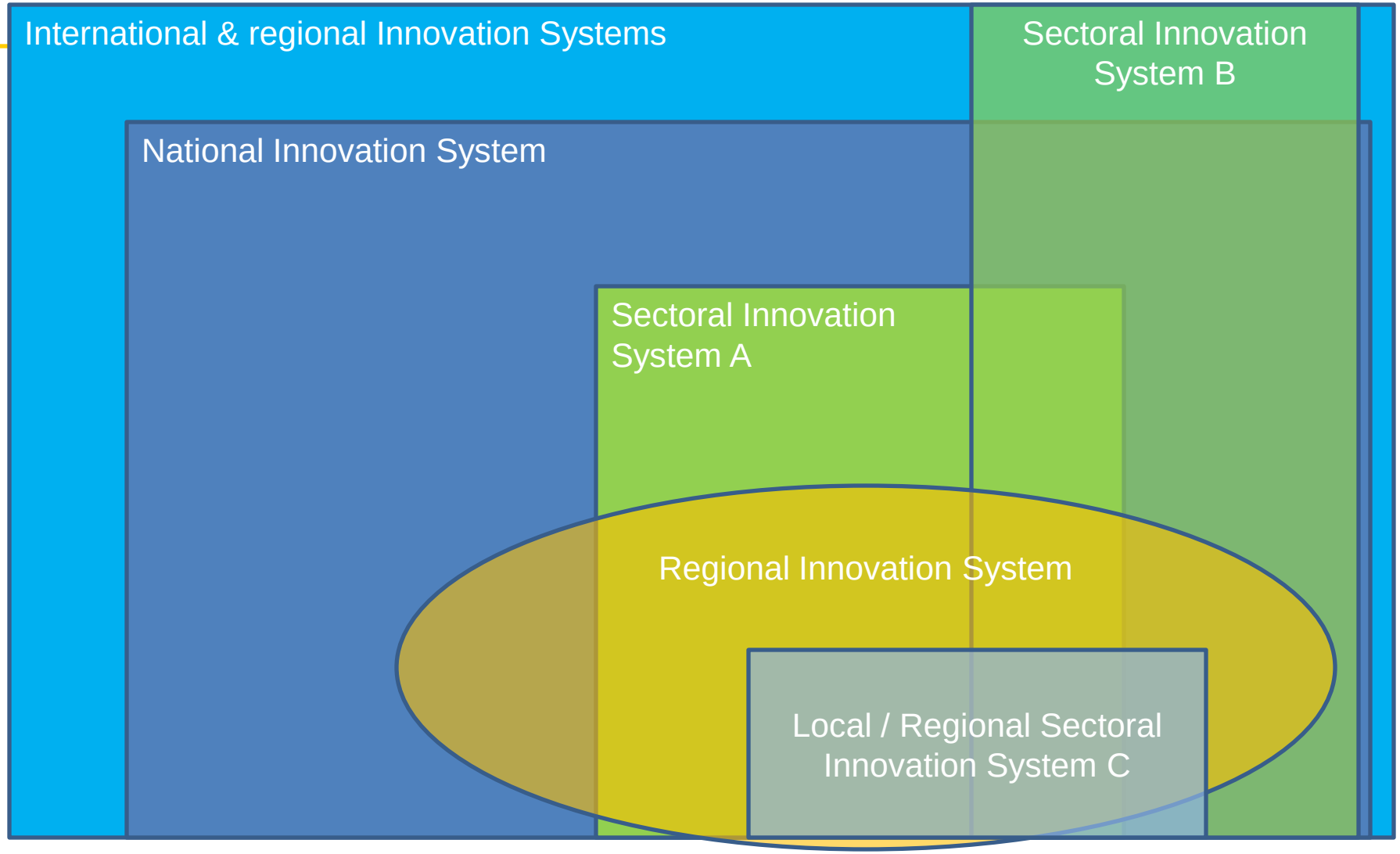
Elements of Technology

Objects of Technology

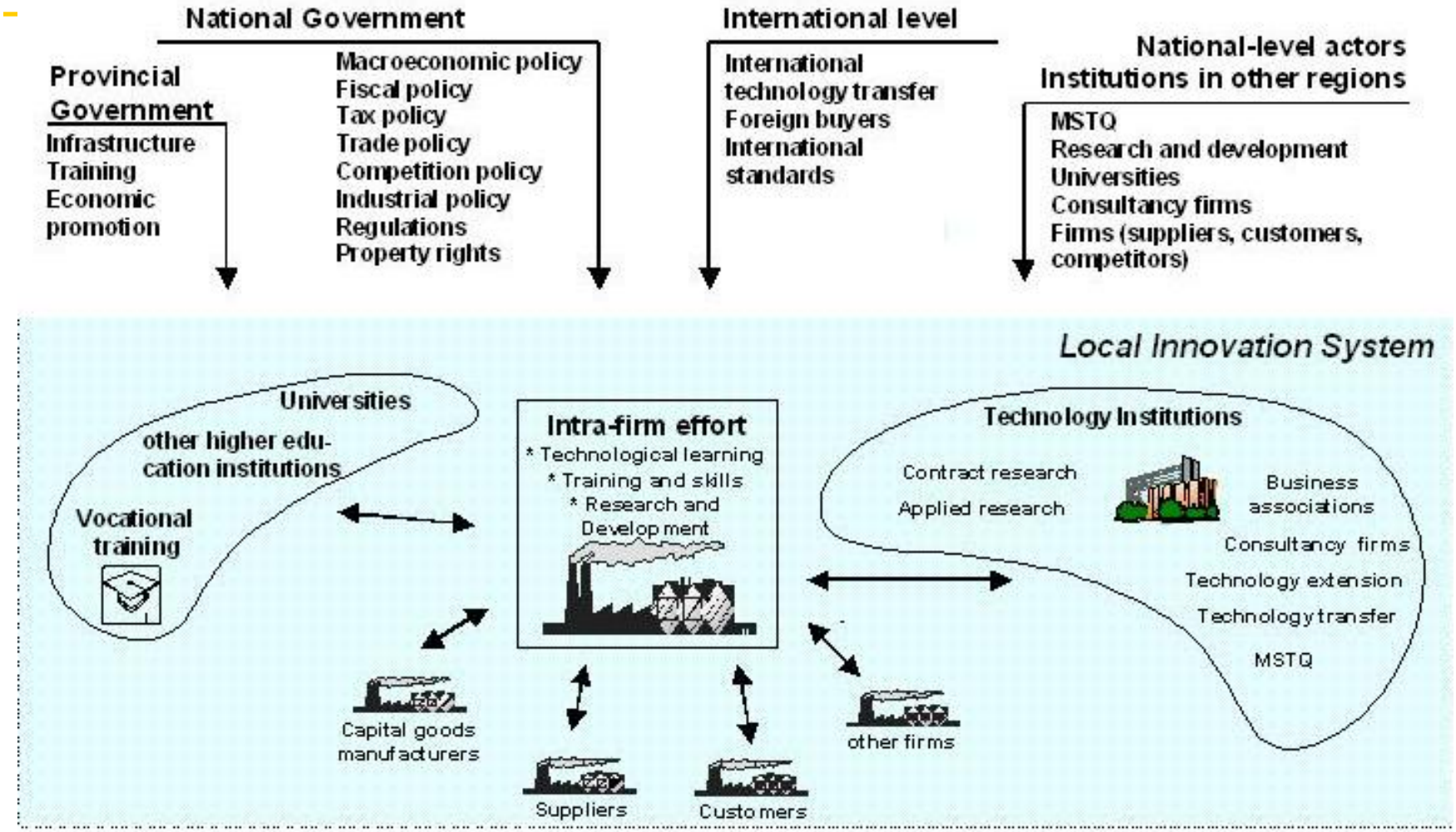


Enos, 1991

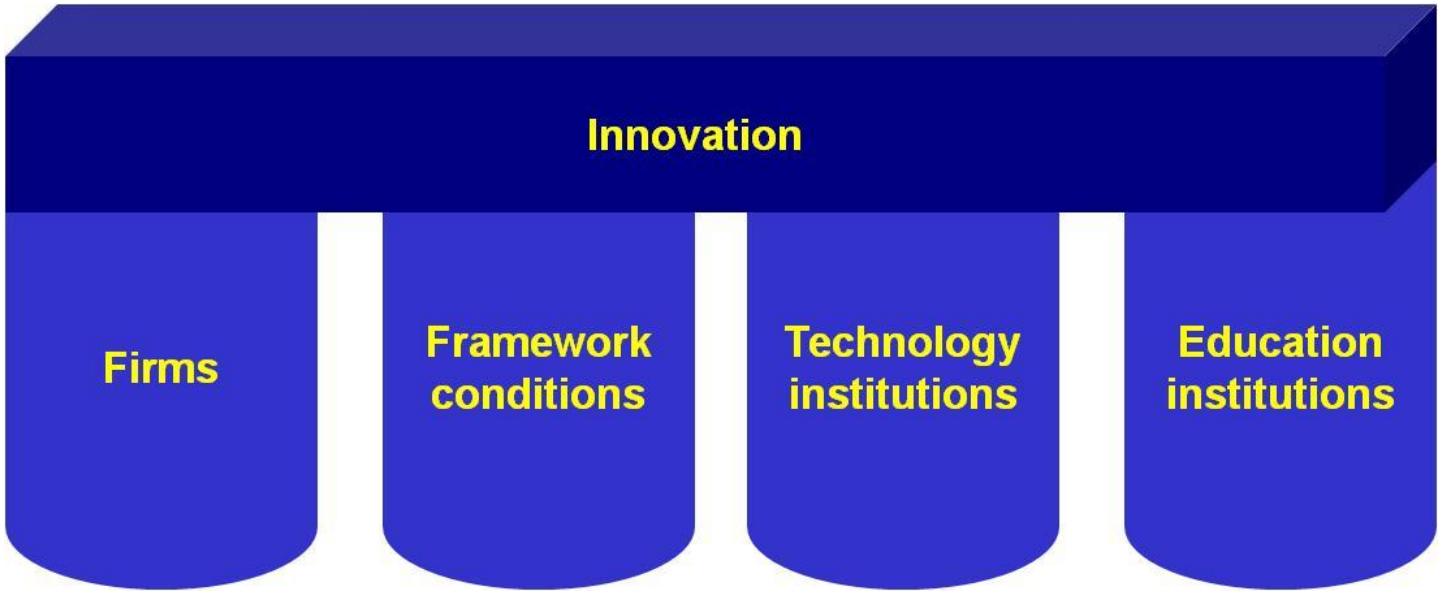
Different perspectives at innovation systems



What is a Local Innovation System? A descriptive perspective



Rapid Appraisal of Local Innovation Systems (RALIS)



Innovation systems: The Four Pillar Model

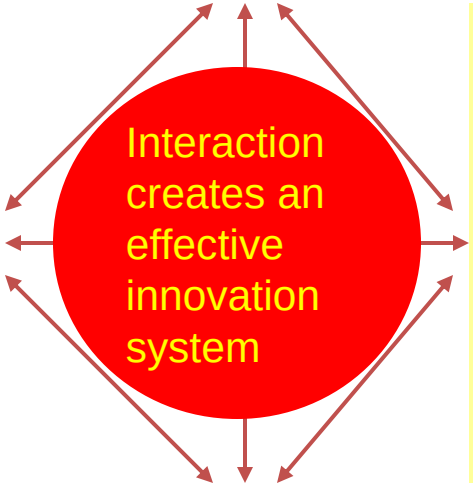
Firms

Intra-firm effort:
* Technological learning
* Skills development
* Research and development

Inter-firm relationships:
* Interactive learning
* Technological alliances
* Joint R+D

Technology institutions

Standards, measurement + testing
Quality assurance + certification
Technology consultancy
Management consultancy
Technology information + demonstration
Technology extension
Research + development
Intellectual property rights protection
R+D financing
Technology assessment



Education institutions

Comprehensive primary education
Technology-related secondary education
Vocational training
Higher education
* engineering
* management
Ongoing training
Public and private providers

Framework conditions

International level	Macroeconomic policy	Industrial policy	International technology transfer	Resource endowment
National government	Fiscal policy	Economic promotion	Foreign buyers	Attitudes and values, learning and change
Provincial government	Tax policy	Regulations	International standards	
Local government	Trade policy	Property rights		
	Competition policy	Infrastructure		

Main insights underlying RALIS

- Innovation is a main driver of growth and prosperity
- Innovation is driven and supported by a variety of factors in innovation systems
- There is a highly relevant territorial (local or regional) dimension to innovation systems
- Territorial innovation systems tend to suffer from
  - disconnection or
  - fragmentation
- Connecting or de-fragmenting a territorial innovation system helps to unleash growth potentials
- RALIS offers an answer to the question: How to do that?

Answers provided by a RALIS exercise

- Who are the main players in a territorial innovation system?
- How do they relate to each other?
- To what extent are they open to change?
- What kind of change would they want or support?
- To what extent would they take an active role, or even responsibility, in facilitating change?

How do we find those answers?

- Talking to stakeholders in the innovation systems
  - individually (interviews)
  - groupwise (miniworkshop)
    - facilitating direct communication among stakeholders on the spot
- ... using specific tools
  - interview guideline
  - various miniworkshop formats, e.g. 4-pillars, Porters 5-forces, Porters Diamond, Value chain mapping

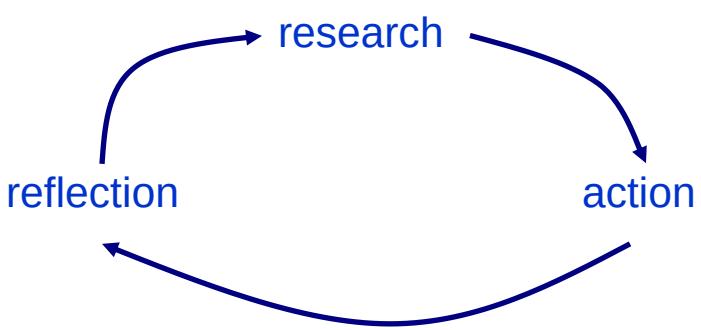
What are the concepts underlying RALIS?

- Action research
- The Rapid Appraisal School of Thought
- The Moderation Method

- Change management
- Evolutionary economics
  - Innovation systems approach
- Governance theory

RALIS is based on “action research” principles

- “Objects” of research become the “subjects” of research
  - research is being conducted by those people who need the results, not by external consultants
- Research is driven by concrete interests and practical concerns
  - research is not guided by academic “fashions”
- A direct feedback loop is created



The “Rapid Appraisal” School of Thought -- Principles:

- offsetting biases
- rapid progressive learning - flexible, exploratory, interactive, inventive
- reversals and triangulation
- principal investigators' direct contact, face to face, in the field
- seeking diversity and differences
- optimal ignorance, and appropriate imprecision

Innovation systems from the perspective of firms

- Innovation systems appear transparent to firms (invisible)
- Most firms innovate when they have to: a) reduce costs, b) solve a technical problem, c) access new market opportunities
- Firms that have to compete, or want to be more competitive, are more likely to innovate
- Many firms with experienced management and staff access innovations locally, sectoraly, nationally and internationally
- The innovation systems elsewhere also influence the performance of local firms
- Sources of innovation for firms are: staff, suppliers, customers, supporting institutions, new knowledge, imitation of others etc.
- Most firms innovate without even recognizing their behavior as innovative, they also confuse R & D with innovation

A value chain: innovation system perspective

- When a value chain is assessed from a perspective of increasing competitiveness of the chain it is easy to identify the innovation aspects in the chain.
- There could be many different innovation systems affecting any link in a value chain
- Different links in the value chain could be at different points in their industry lifecycles
- Look out for product innovation, process innovation, business model innovation and value chain system innovations at the level of firms in the chain
- Especially look at the role of input and equipment suppliers, knowledge intensive business services providers, various kinds of education and training providers, and technological agents
- Lastly, look at intra-firm interaction as well as the framework conditions
- If there are prevailing framework conditions that hampers the performance of the value chain, then use scenarios to turn obstacles into innovations!

Practical example of interacting innovation systems around1 firm

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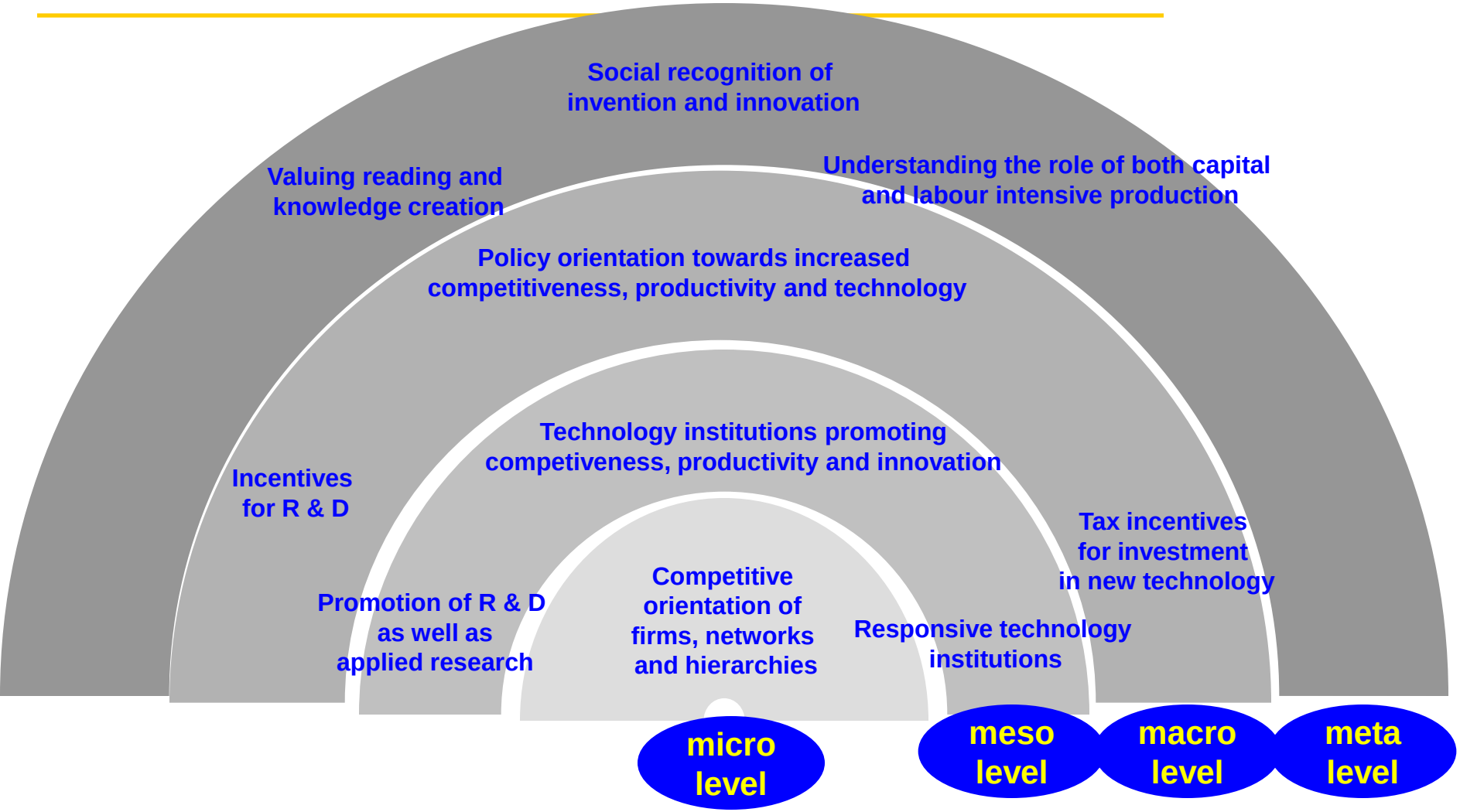
connect the dots

1. Raw material (Al.)
2. Machine tooling from local tooling firm, designed in Germany

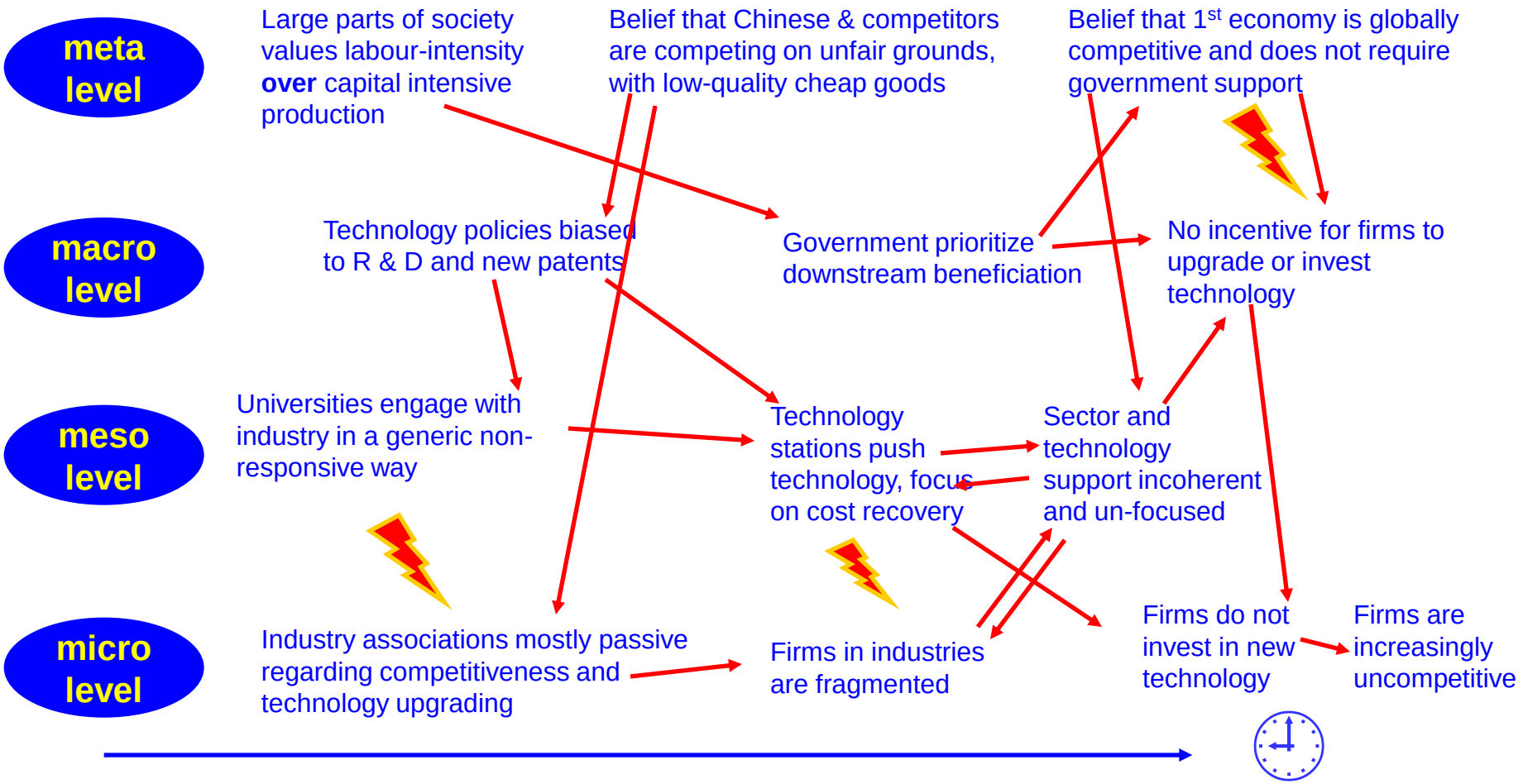
3-4 Forging and machining plant. Designed in Germany, machines from Japan, maintained and enhanced in RSA

5. The steps of conversation
6. Quality control bench, orange parts local, red parts national and international
7. The components in a sub-assembly
8. The components in final product
9. Management innovation by local service provider

How does QI fit into the evolution of innovation systems?



System dynamic of intervention:
The machine tooling sector in RSA



Assessing innovation systems, combining old and new

- Use value chain logic, but search for sources of competitive pressure as an impulse to innovation
- Work from the ‘unreasonable demands’ of customers and lead users
  - Connect with ‘global buyers’ and with lead-firms, and identify potential opportunities for innovation
- Work with education institutions or technological institutions as hosts, and **develop technological institutions** to be more responsive and appropriate to demands from industry
- Try to stimulate 2-way traffic between industry and education, for example, joint problem solving or joint publications
- Do not forget the meso-layer, nor the intra-firm cooperation

RALIS findings: local, sector, national and regional

- Technological advance and increased productivity and competitiveness concepts are disconnected at all levels
- Technology mainly seen as an object (hardware), with other forms of technological advance and innovation hardly recognised
- Innovation is confused with R & D and invention
- Industry at local, provincial, national and regional levels are disorganized, unfocused and naïve about competitiveness
- Universities and technology institutions often have a technology push focus, and engage with industry in a generic way
- Interaction between industry and technology institutions are often shallow or even non-existant, not focused on problem solving
- Government policies focused on downstream beneficiation, and not on unlocking supply-side constraints
- Mainly demanding lead-sectors exist, but they fall outside of focus
- Focus on large multi-year programmes at all levels, rather than practical and incremental problem solving approaches

RALIS: What next?

- Better tools to investigate inter and intra firm innovation
- Experiment with lead-user innovation concepts
- Expand the focus beyond ‘the firm’ to include sources of innovation in society, schools and individuals
- Find ways to combine analysis of innovation system with capacity building of lead-innovators in the system
- Better support communities of practice
- Better understand market failures on innovative behavior
- Use the media to achieve change, address myths and increase information flows
- **Combining rapid appraisal with long term stimulation of the innovativeness of the system!**