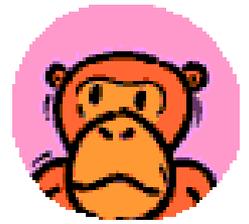




# BSUA 2012: Education Needs for Innovation

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# Nothing new under the sun?



*“Inventions have long since reached their limits,  
and I see no hope for further developments”*

-- Roman engineer Julius Sextus Frontinus, 10  
C.E.

*“Technology advancement will not stop”*

-- Naoyuki Akikusa, *Fujitsu, i2010* conference  
2006

# Guidelines for my Presentation



- Basic research is very important
- Education based on research is important
- University autonomy has its importance
- Business is not all that matters
- University change => What kind of education is needed in 2020?
- From education to learning!
  
- Open innovation vs. commercialisation?
- Innovation vs. technology development?
- Does collaboration ruin the science?

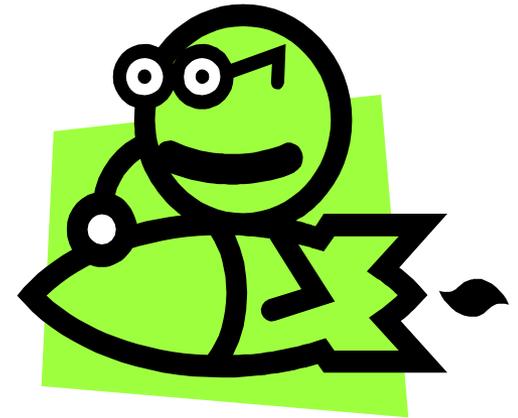
# Traditional University (1G & 2G)

- Educating clergymen => educating civil servants => educating experts in various fields
- Idealistic university vs. functionalistic university vs. rationalistic university
- University administration (academic qualifications, seniority) vs. university management (management experience and skills)
- Peer review, autonomy



# Changes in the University Sector (in Finland)

- New university models
- Bologna Agreement
- Third mission (in addition to research & teaching)
- Polytechnics
- Funding changes:
  - Diminishing public funding
  - Increasing external funding (FP7, EIT,...)
  - Productivity pressures
  - Quantitative measures over qualitative
- Environment changes, industry changes
- Management needs
- Innovation needs



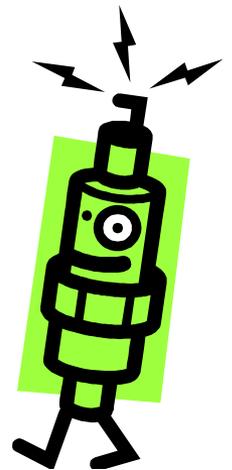
# The Finnish Paradox in the Field of Innovation

- The Finnish innovation system development since 1979
- Universities, research units, Science Parks etc.
- Large R&D spending (#3 in the world/capita), TEKES
- Entrepreneurial activity low (GEM)
- Too few research-based innovations
- Too few growth companies in knowledge-intensive areas

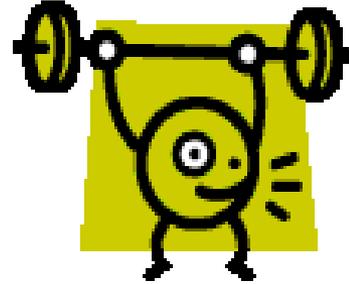


# Innovation (Schumpeter 1934, Baumol 1990)

- A new good or a new quality of a good
- A new method of production not previously tested, that does not need to be founded upon scientific discovery
- Opening a new market, ie. a market that a firm has not previously entered, whether or not this market has existed before (Ansoff's product/market matrix)
- A new source of supply of raw materials, irrespective of whether this source already exists or has first to be created
- The carrying out of new organisation



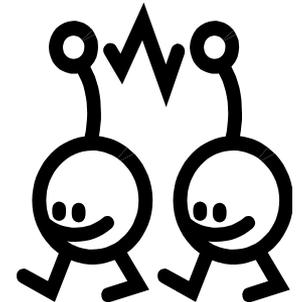
# Suggestions to Universities in Innovation System



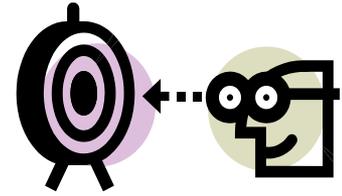
- More collaboration between various disciplines => **changes in education?**
- More collaboration with external experts => **changes in education?**
- Entrepreneurship & innovation education, not just B-school functions
- Strategic emphasis on third pillar activities => **relevance?**

# The Role of Universities

- Development projects funded by external sources, such as the EU, require University presence
- Funding changes in the University sector – More external funding
- Companies want to use Universities' knowledge and knowhow
- Universities learn from University-Industry collaboration

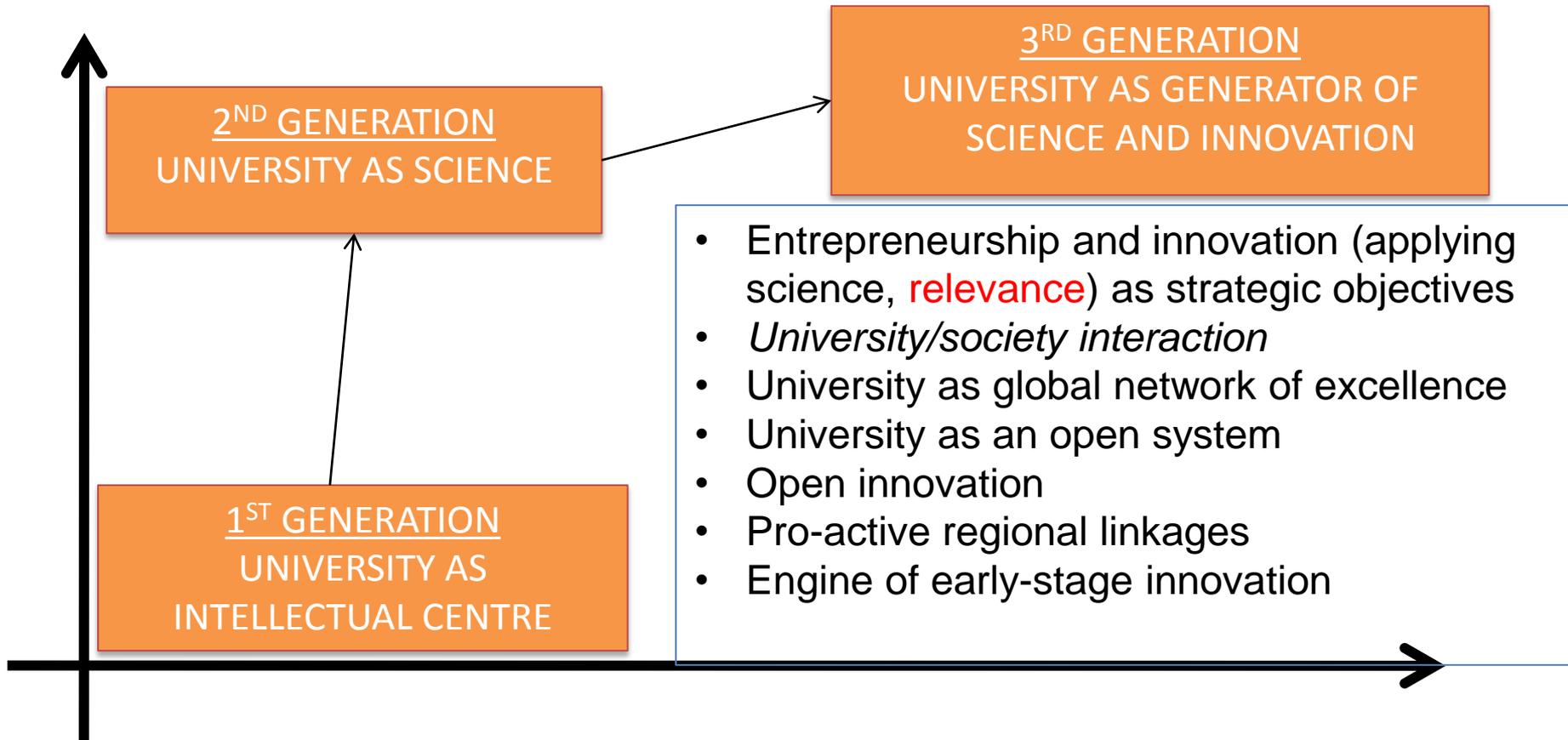
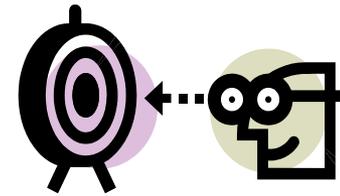


# 3G/Entrepreneurial University



- Entrepreneurship research
- Small business ideology
- From B-School to I&E-School
- Core competence, specialisation, co-operation
- Cross-disciplinary activities
- Internal ability change, external funding
- Customer, competition, co-operation
- Students are active, too!
- Huge change in university strategy!

# 3G/Entrepreneurial University



# 3G University

Multi-disciplinary  
International  
Networked

Broad academic impact  
Collaborative actions

Public funding

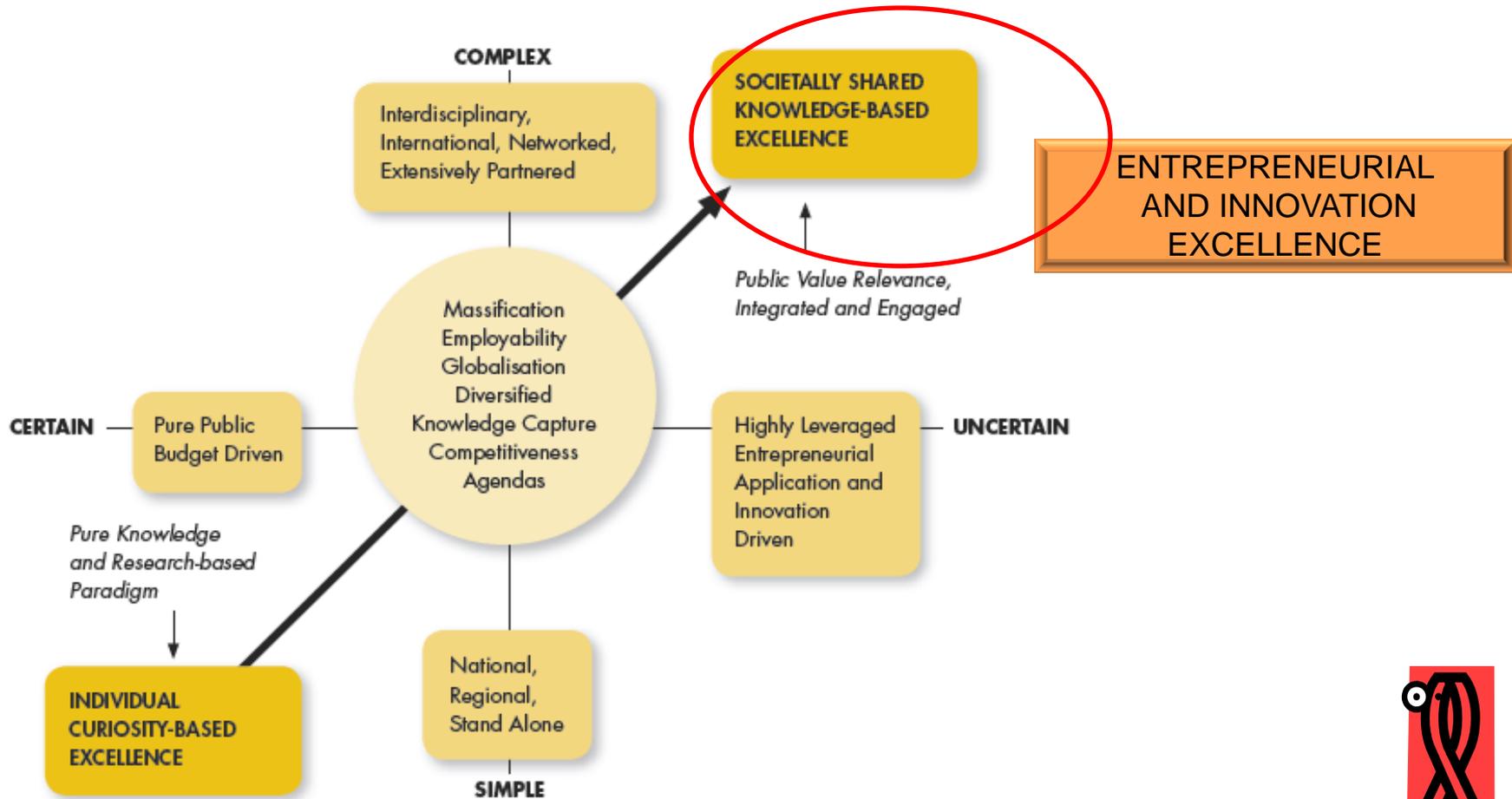


Project driven  
Innovative  
Applied knowledge  
Open

Individual curiosity as a driver  
for new knowledge

National/individual

**FIGURE 1 - THE CHANGING UNIVERSITY PARADIGM**



Acknowledgements to Professor Antti Paasio of the University of Turku Finland who provided the germ of the idea. While the arrows on the Simple/Complex and Certain/Uncertain matrix point in one direction it is possible for a university to move from any one segment to another.

# University-Industry Co-operation



**INDUSTRY**

## Industry formulated R&D (sub) contracted work

- Short term focused activities and small projects
- Collection of uncoordinated projects and fragmented overall R&D and knowledgebase formation
- No re-usability for the value chain
- *On-demand product centric work*

## Preferred model

### Industry-academy joint platform based on active dialog and value chain integration

- Joint foresight activities
- Scenario-based roadmaps: *VISION CENTRIC*
- Integration of value chains
- Short term strategic and coordinated R&D projects
- International co-operation for business development and strategic R&D
- Formation of strategic regional platforms
- Integrating regional/national knowledge base
- Joint vision driven platform centric work in form of subcritical programs
- *Innovation centric platform*

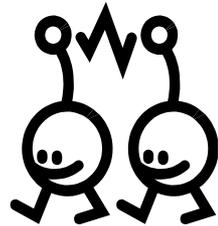
### Academic self-generated problem statement driven research

- No value chain or industrial usability of results pre-defined
- Individual/competence R&D
- Individual driven innovation and entrepreneurship
- Small projects
- *Competence centric*

**ACADEMY**

# University-Industry Linkages – Building Collaborative Links with Industry

- Internal collaborative reward systems are usually inadequate within the university sector (silos!)
- Most common types of industrial linkages are usually research funding and sponsorship of chairs, research centres and researchers
- Benefits to working with industry - closer collaboration with firms give researchers the opportunity to focus on real-world problems and to broaden the researchers' experience
- Close partnership with industry can also add to the quality of research



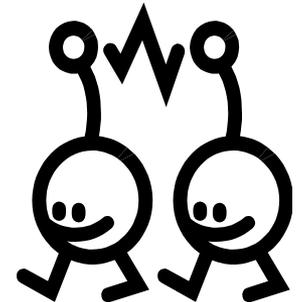
# University-Industry Linkages – Barriers to Develop Increased Links with Industry



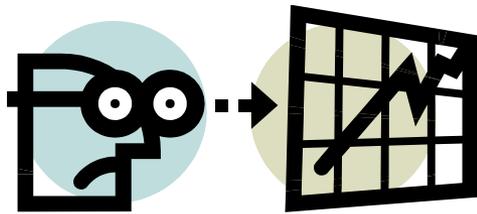
- Lack of internal resources at both on individual and institutional level – Problems with fixed funding schemes
- Continued emphasis on traditional outputs for academic work, such as publications
- Not enough internal university funds to develop industry linkages
- Gap of knowledge by academics & industrialists about each other's organisational cultures
- Gap in the priorities of each partner relative to the research results produced from joint projects
- Universities are bureaucratic and many firms can have problems in dealing with the labyrinthine procedures of the academic institution (LSEs are bureaucratic, too!)

# Current trends in technology/innovation

- From technology development to innovation
- Customer/end-user focus
- Digitalisation of products and services
- Blue ocean strategies, long tail
- Communities
- Co-operative R&D
- Complementary skills involved in R&D
- International focus from the beginning
- Flexibility



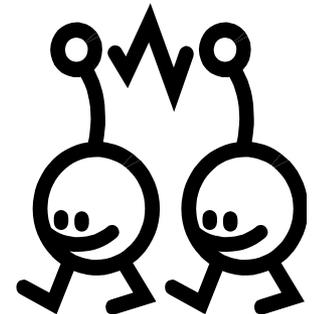
# University-Industry collaboration in the future



- More University-Industry collaboration
- Collaboration becomes part of day-to-day activities in Universities
- Industry needs more external R&D: from projects to collaboration
- Example: BID's PhD+MBA

# Conclusions

- Internal collaboration leads to external collaboration (no silos!)
- Funding pressures increase the need for collaboration – measuring innovation output!
- Industry collaboration is everybody's job!
- From technology development to innovation - relevance
- Innovations through cross-disciplinary actions



***“Anyone who has never made a mistake has never tried anything new.”***

***“Imagination is more important than knowledge.”***

***“Any intelligent fool can make things bigger and more complex. It takes a touch of genius - and a lot of courage to move in the opposite direction.”***

