



GLOBAL EDUCATION DIALOGUES  
**The East Asia Series**  
2013-2014

# **Triple Helix**

## **Prof. Richard B. Davies**



**Wales, UK**

# Context: The First Challenge

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Business - different requirements

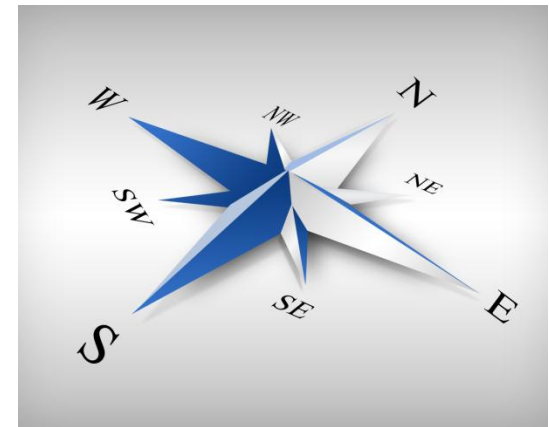
## 2) Universities – different missions, capacity & capability

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### 3) Government - different organisation structures, political context, and resources

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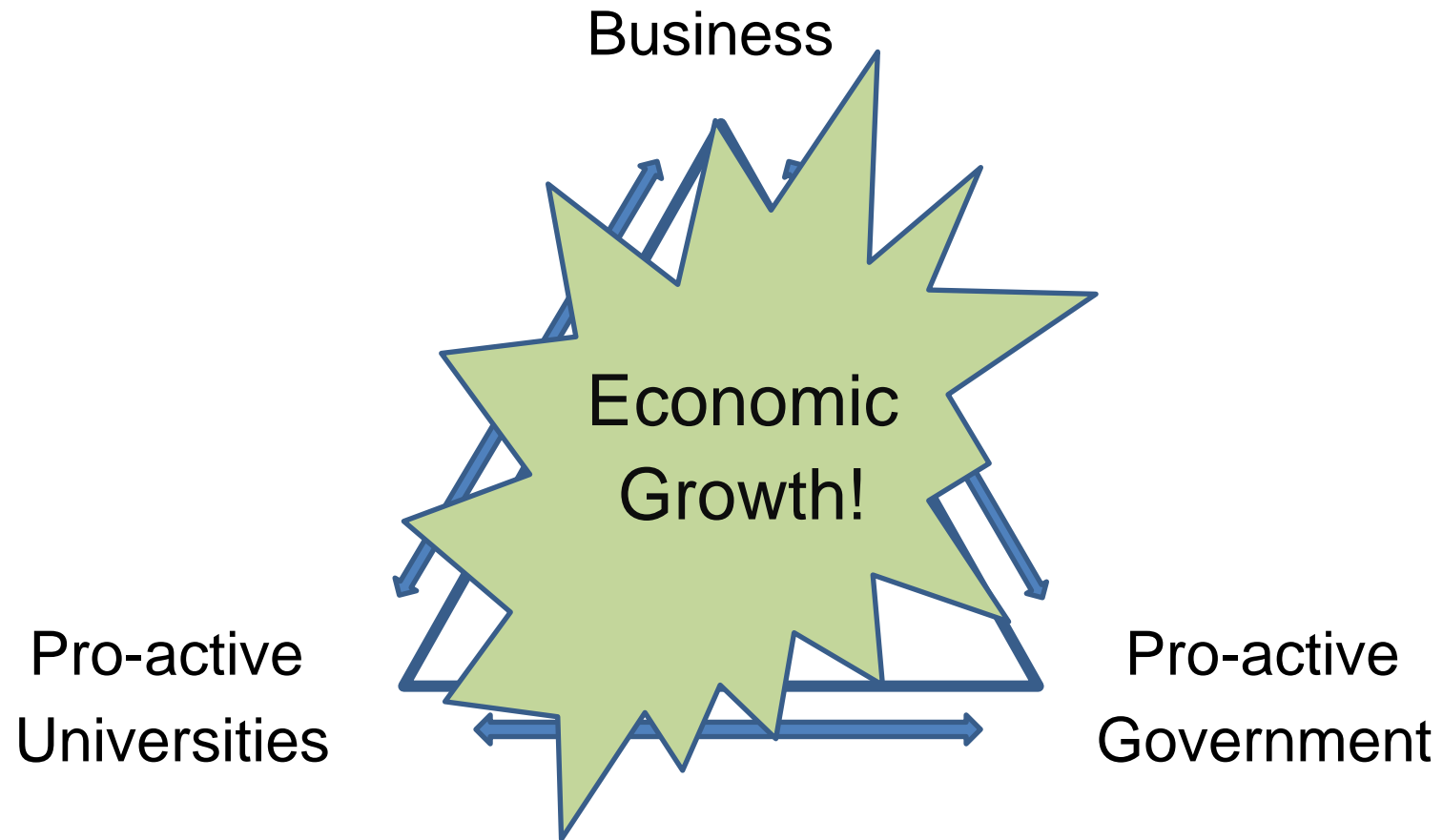
# ...There is no ONE way

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# Prefer Triangle to Triple Helix

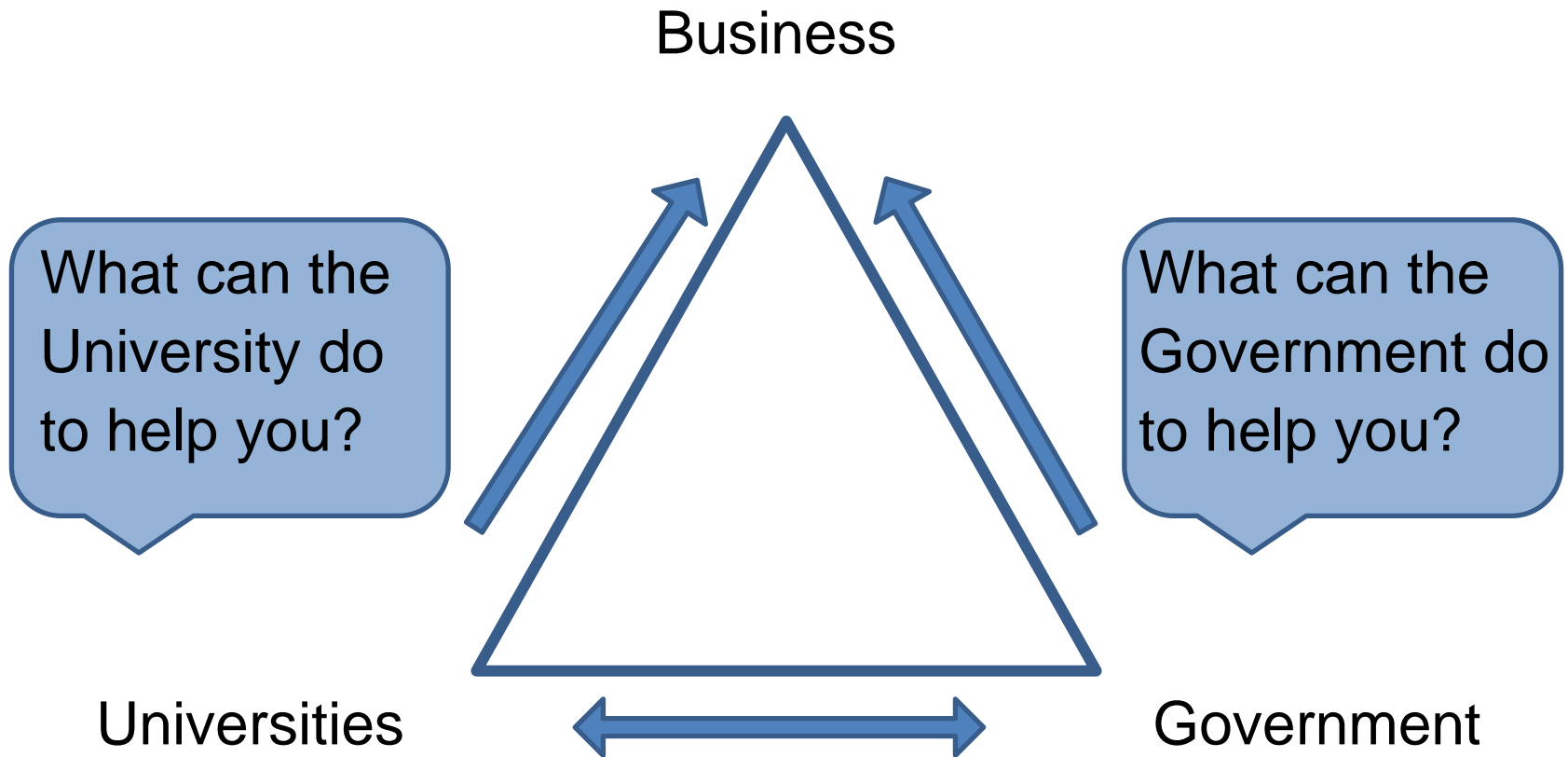
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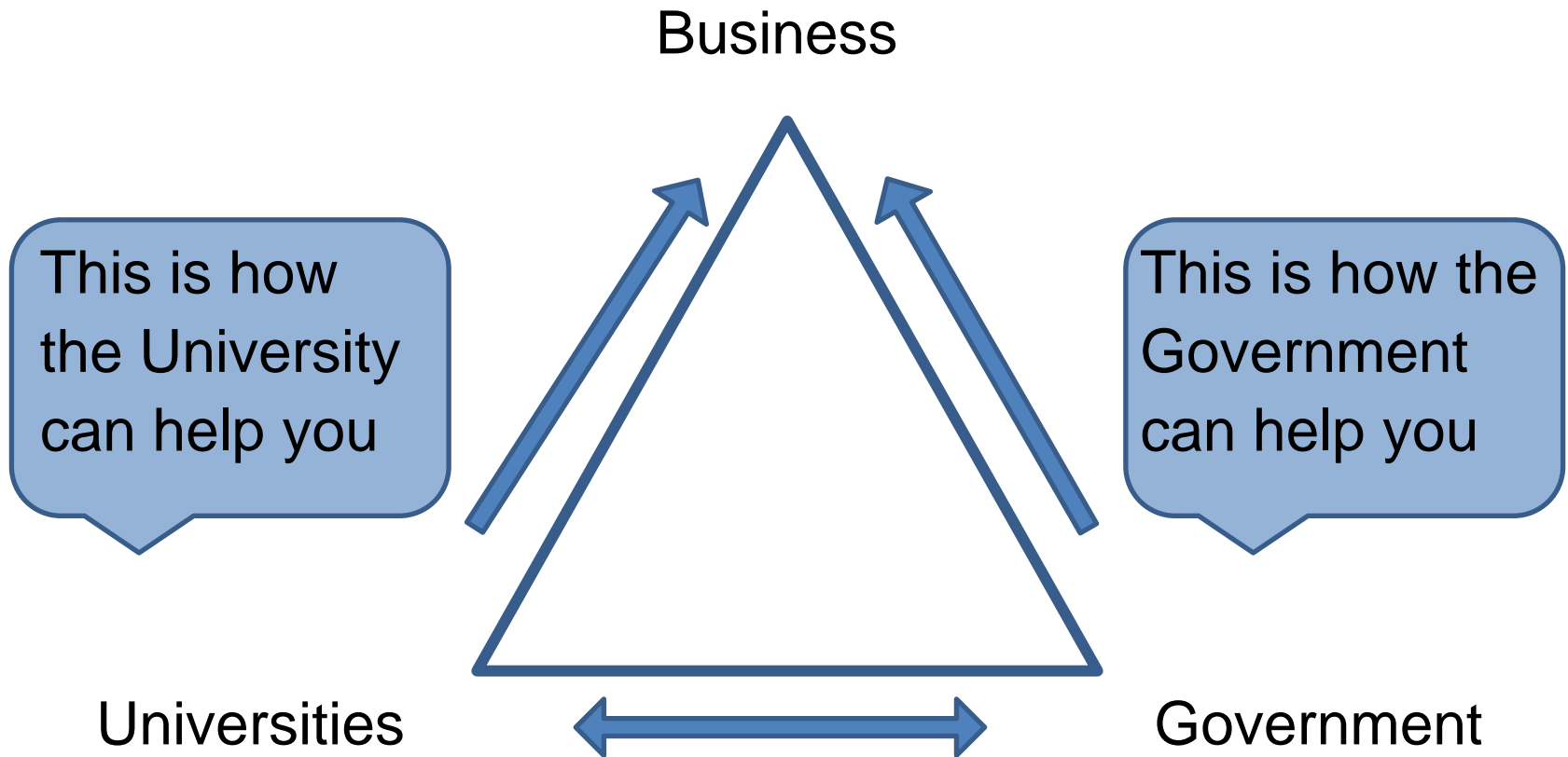
# Large Companies know what they want

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# Small Companies need guidance

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**Raising aspirations and providing support**



# New Science and Innovation Campus under Development at Swansea University

- **\$90m European Investment Bank**
- **\$55m European Commission (Structural Funds)**
- **\$25m Welsh Government**
- **\$20m UK Government**
- **More than \$100m Industry (including gift of 40 hectares site)**

**“The best university-led Knowledge Economy project in Europe”**



**Phase 1**



# Large Companies: Longer term thinking

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Large companies employ competent professionals but need access to advanced expertise, found in research intensive universities

The challenge to government is:

Well understood



1. Sufficient university funding to create globally competitive research infrastructure & research strengths, particularly in science and engineering

# Research: global challenges

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## Government Funded UK Cross Research Council Programmes

- Planned expenditure over current period: £1.4bn
- Major response to strategic challenges for the nation – and the world

Nano science



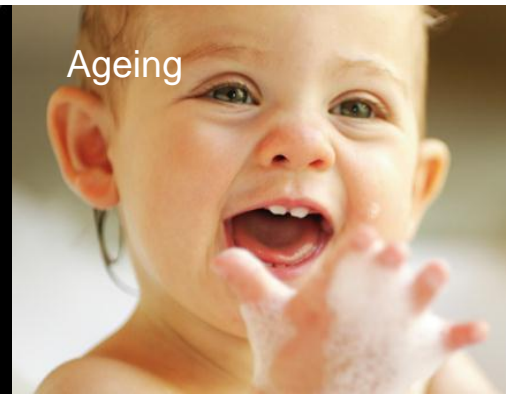
Digital Economy



Living With  
Environmental Change



Global Uncertainties



Ageing



Energy





**For example, Swansea University functional coatings project with Tata Steel:**

**\$15m UK funding from a Research Council**



# Buildings as Power Stations



Research focus on steel and glass on buildings



100million m<sup>2</sup> glass



200million m<sup>2</sup> steel cladding

## Steel and glass roofs and facades as solar collectors

### Generate Store Release



# Large Companies: Longer term thinking

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# Problem 1: A Leadership Gap

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## Technology Readiness Levels

**TRL 1-3**

Research

**TRL 3-6**

Technology development  
and scale up

**TRL 6-8**

Component and  
system  
development

**TRL 8-9**

Commercial  
implementation

University

Market

**PUSH**

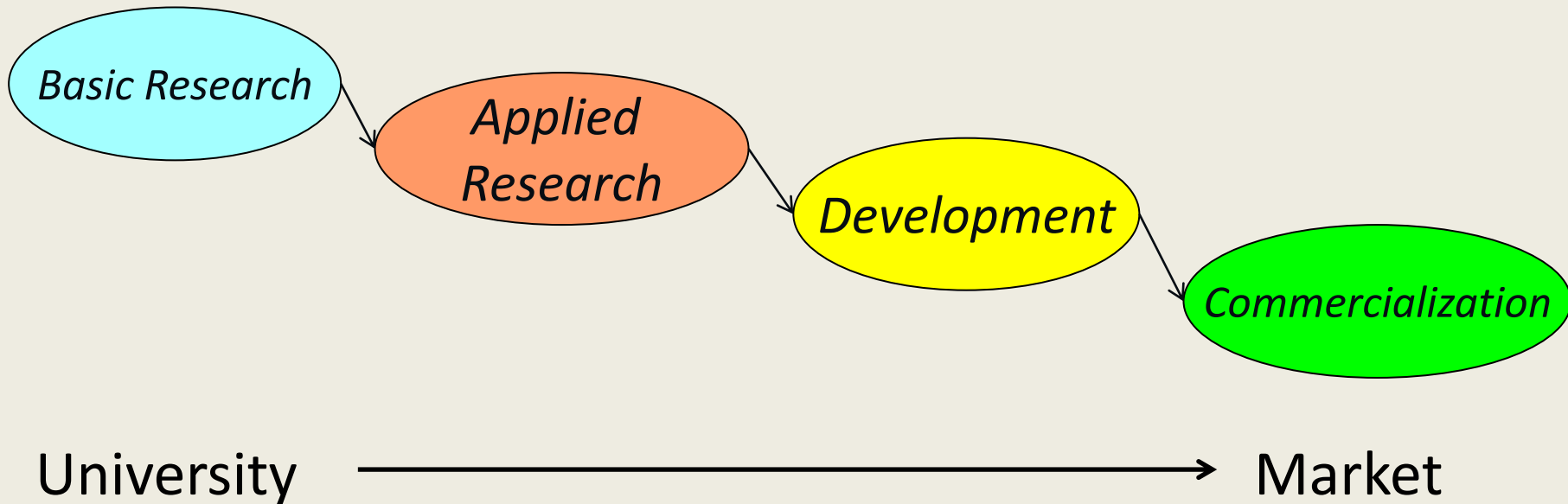
**PULL THROUGH**

**PULL**

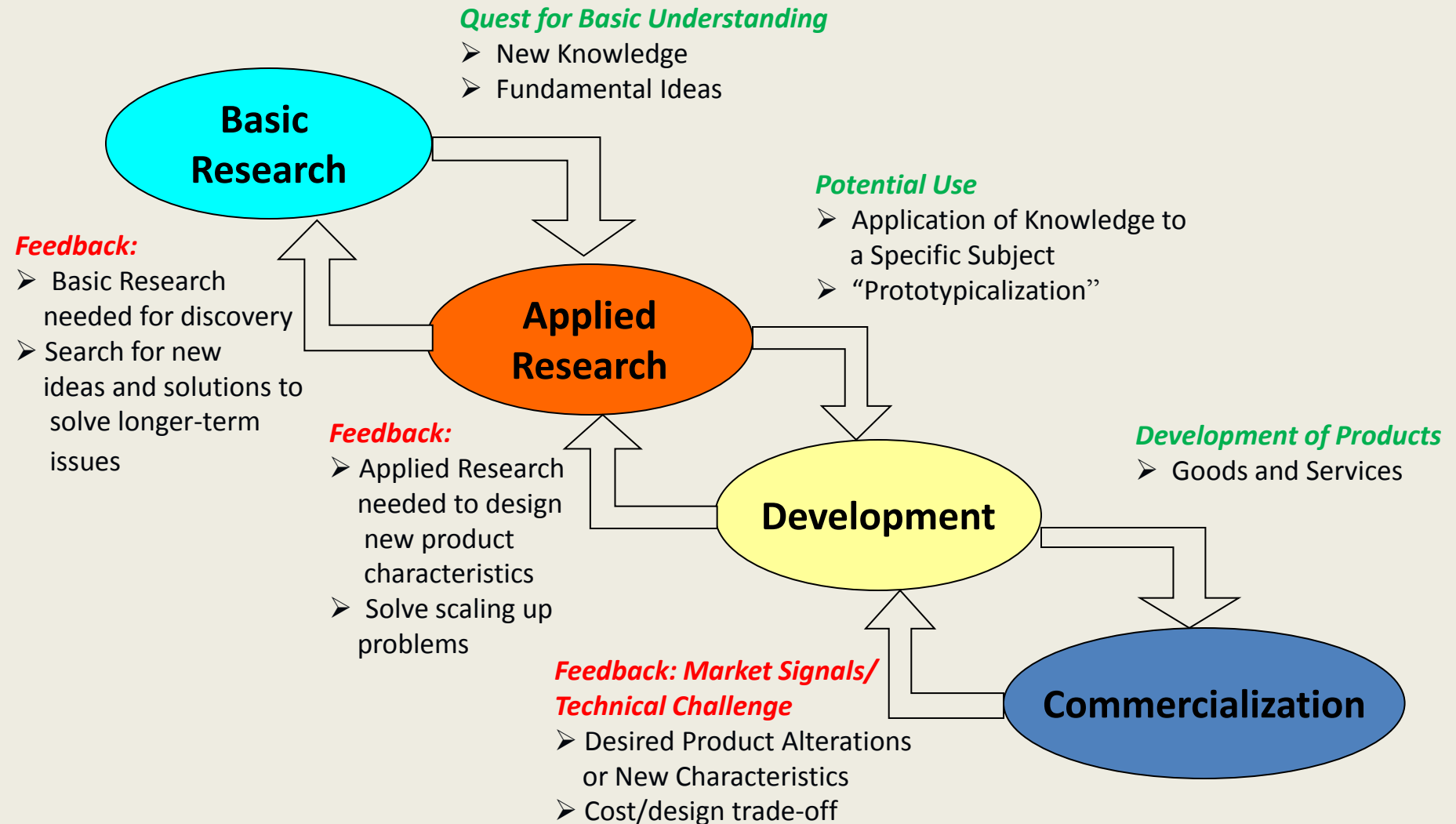
## Problem 2: The Myth of Innovation

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Innovation is **NOT** a Linear Process



# Non-Linear Model of Innovation



# Pilot line for scaling up functional coating technology

Funded by UK and Welsh Government grants to Swansea University





# Another Example in the UK

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## EPSRC Centre for Innovative Manufacturing:



UNIVERSITY OF  
CAMBRIDGE

Imperial College  
London

MANCHESTER  
1824

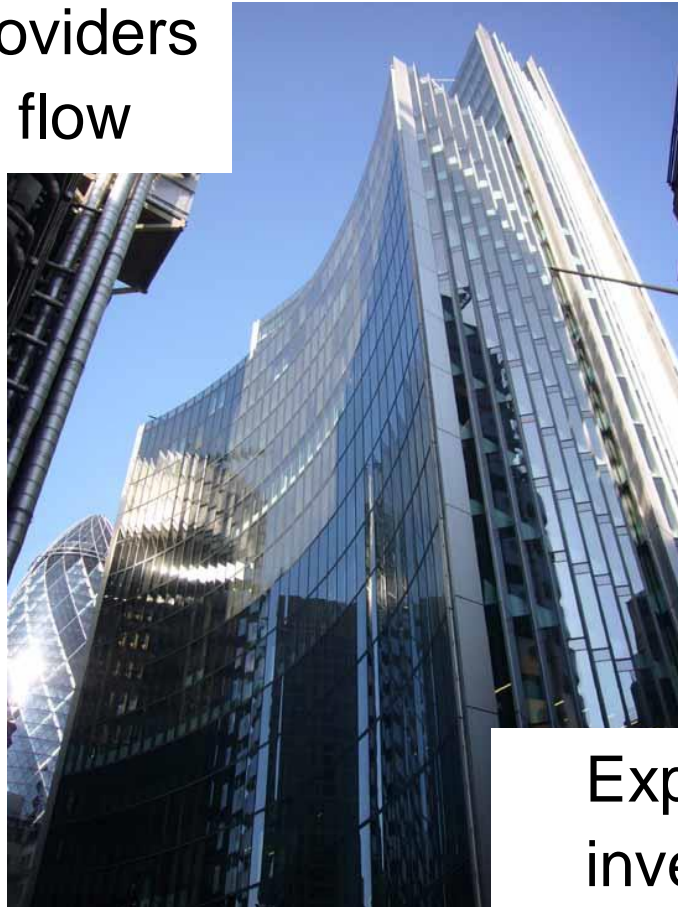


# Large Companies: Longer term thinking (Skills)

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Future high-level skills

Universities as providers  
of graduate talent flow



Expectation of Govt.  
investment in high-level  
skills



# SMEs: Shorter term thinking

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Limited professional  
expertise

Owner-managers

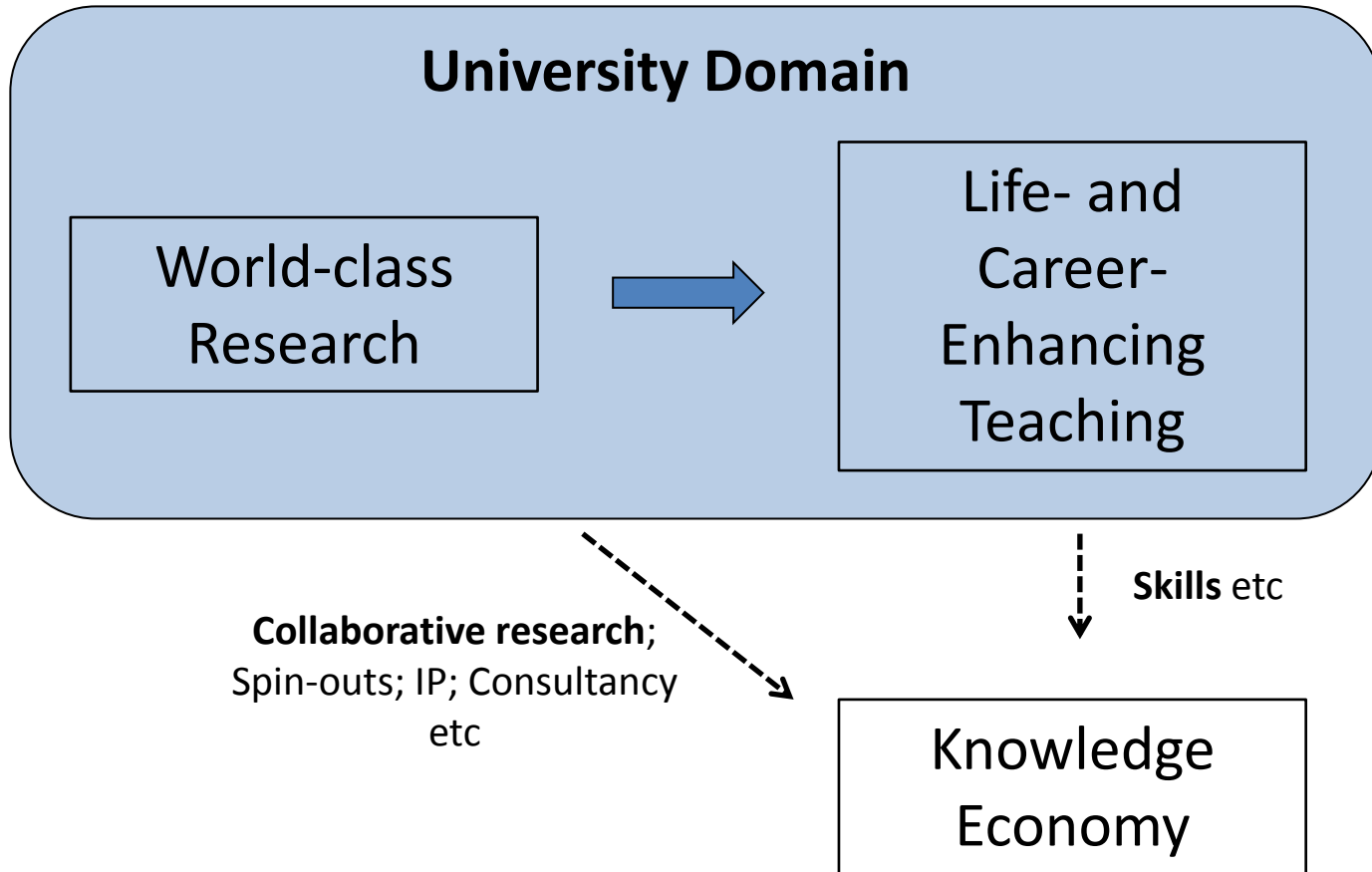


Unclear picture of requirement

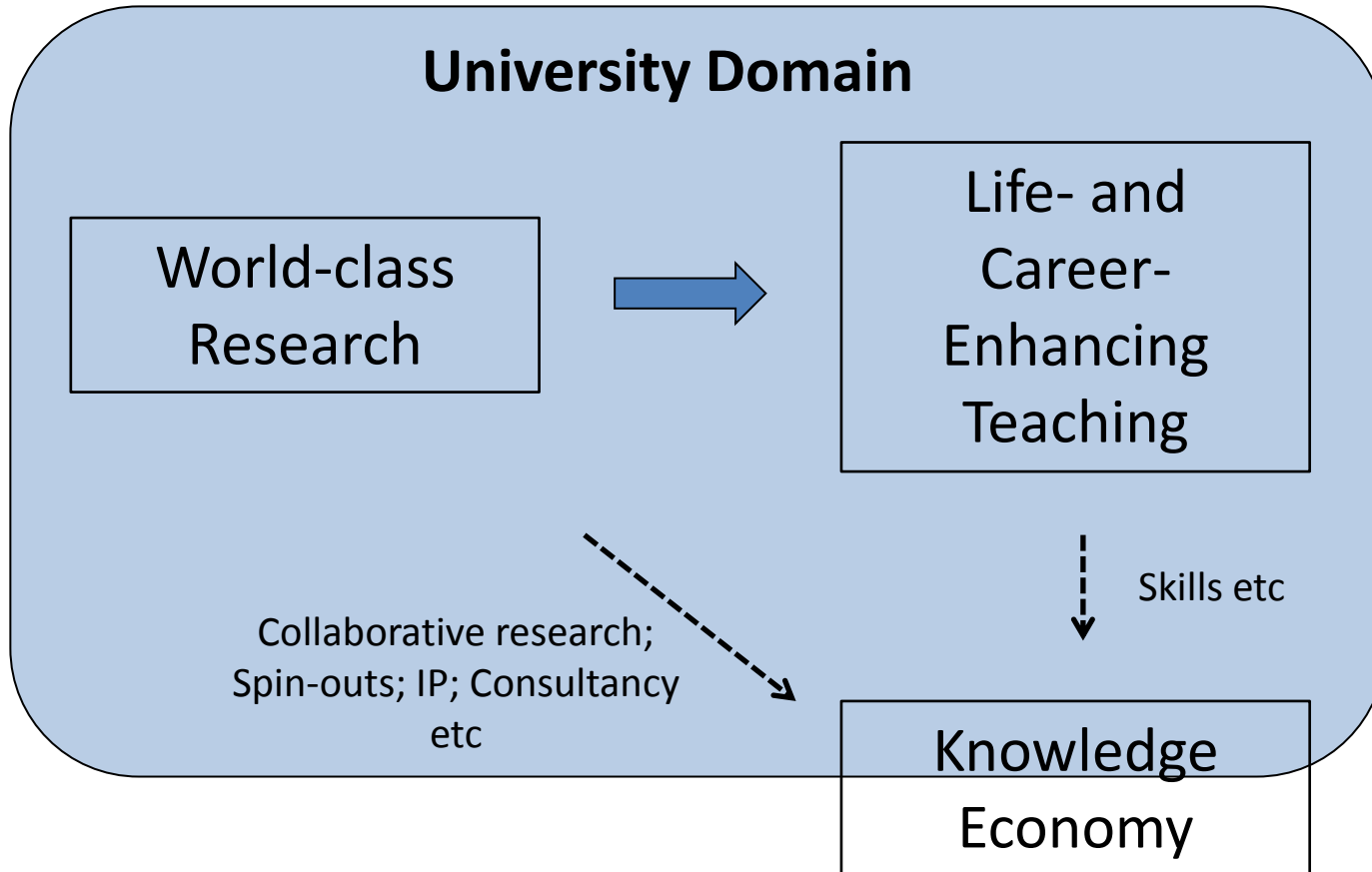
Routine expertise very  
effective, but cost critical



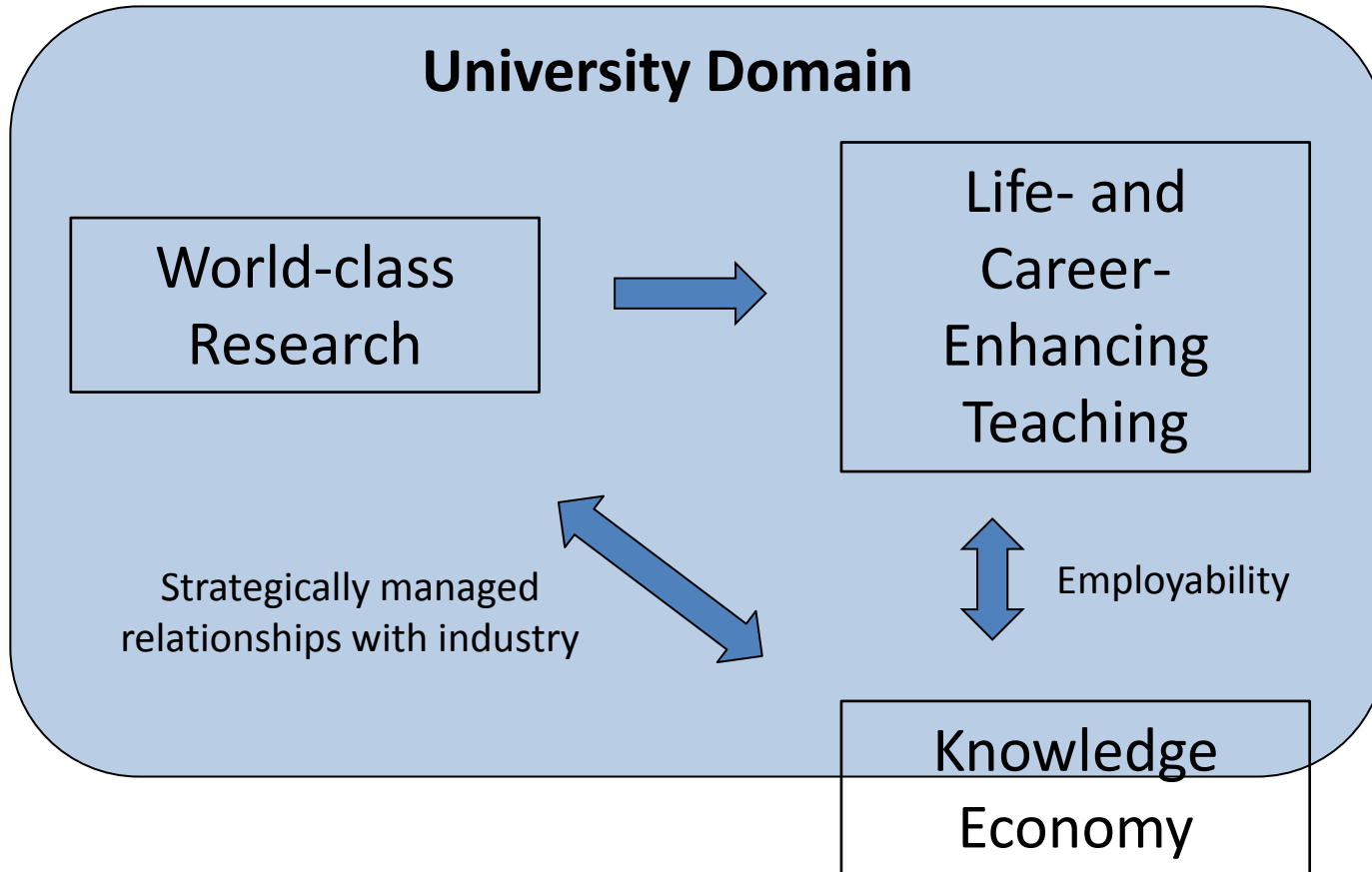
# The 20<sup>th</sup> Century Research-Intensive UK University



# Swansea University's 21<sup>st</sup> Century Ambitions



# Swansea University's 21<sup>st</sup> Century Ambitions



# Swansea University/UK context lessons

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# Components of successful KE growth

KE Growth	<u>B</u> usiness	<u>I</u> nstitution	<u>G</u> overnment
<u>F</u> inancing	Venture capital	Research Grants	Business Investment Funding
<u>R</u> egulation	IP ownership	IP-Commercialisation policy Conflicts of Interest policy HR-Reward systems	State Aid rules
<u>I</u> nfrastructure	Clustering	Research Institutions & incubators	Subsidised buildings/energy
<u>E</u> ntrepreneurship	Internships Mentoring	Teaching Mentoring Coaching	
<u>N</u> etworking	Co-location	Co-location Strategic Research Partnerships Multi-disciplinary working	Relationship management
<u>D</u> emand-led	Global Markets	Strategic (KE) sector focus Regional economic engagement	Sector prioritisation strategy
<u>S</u> kills	Training investment (Research & Leadership) Product to Market	Research specialisation & excellence Centralised research & innovation support	Higher level skills investment

## Good luck on the journey...

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‘Success is not final, failure is not fatal: it is the courage to continue that counts.’

(Incorrectly) Attributed to Winston Churchill





# Thank You

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