

The Role of Education, Science & Technology in National Security

28th July, 2016

by

Lt Gen (R) Muhammad Asghar
Rector NUST





Introduction



Introduction

Influence of knowledge on Security

- Knowledge has directly or indirectly influenced human hearts and minds, changed their way of life and transformed the concept of security over time.

Introduction

Comprehensive Ceoncept of Security

- We should talk of comprehensive education and its linkage with comprehensive concept of human well-being and security today.

Introduction

The impact of Complexity of Problems

- The human beings are today faced by wicked problems – problems which are so complex and multi-dimensional that an attempt to solve them in one domain injects a deformity in the other

Introduction

The Pace and Magnitude of Change

- The pace and magnitude of change raises the fundamental question of sustainability specially when creative class pursues disruptive technologies and innovative business models

AIM

To review the evolution of the
instruments of knowledge and study
their impact on human security

SCOPE

- The evolution of the instruments of knowledge and their impact on national security
- The New Security Paradigm
- The role of Universities in the new Knowledge Eco-System



The Evolution of The Instruments of Knowledge and their Impact on National Security



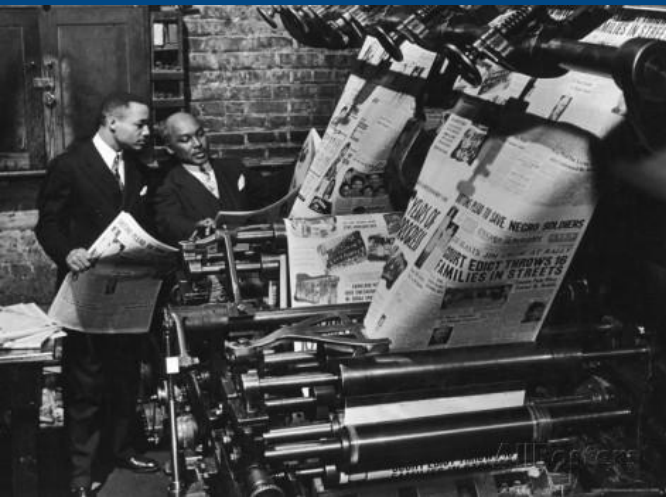
The Evolution of The Instruments of Knowledge and their Impact on National Security

- The period from 692 to 945 AD is known as the Islamic Golden Age, because of its comprehensive concept of human life and where physical sciences and spiritual sciences were in complete harmony.



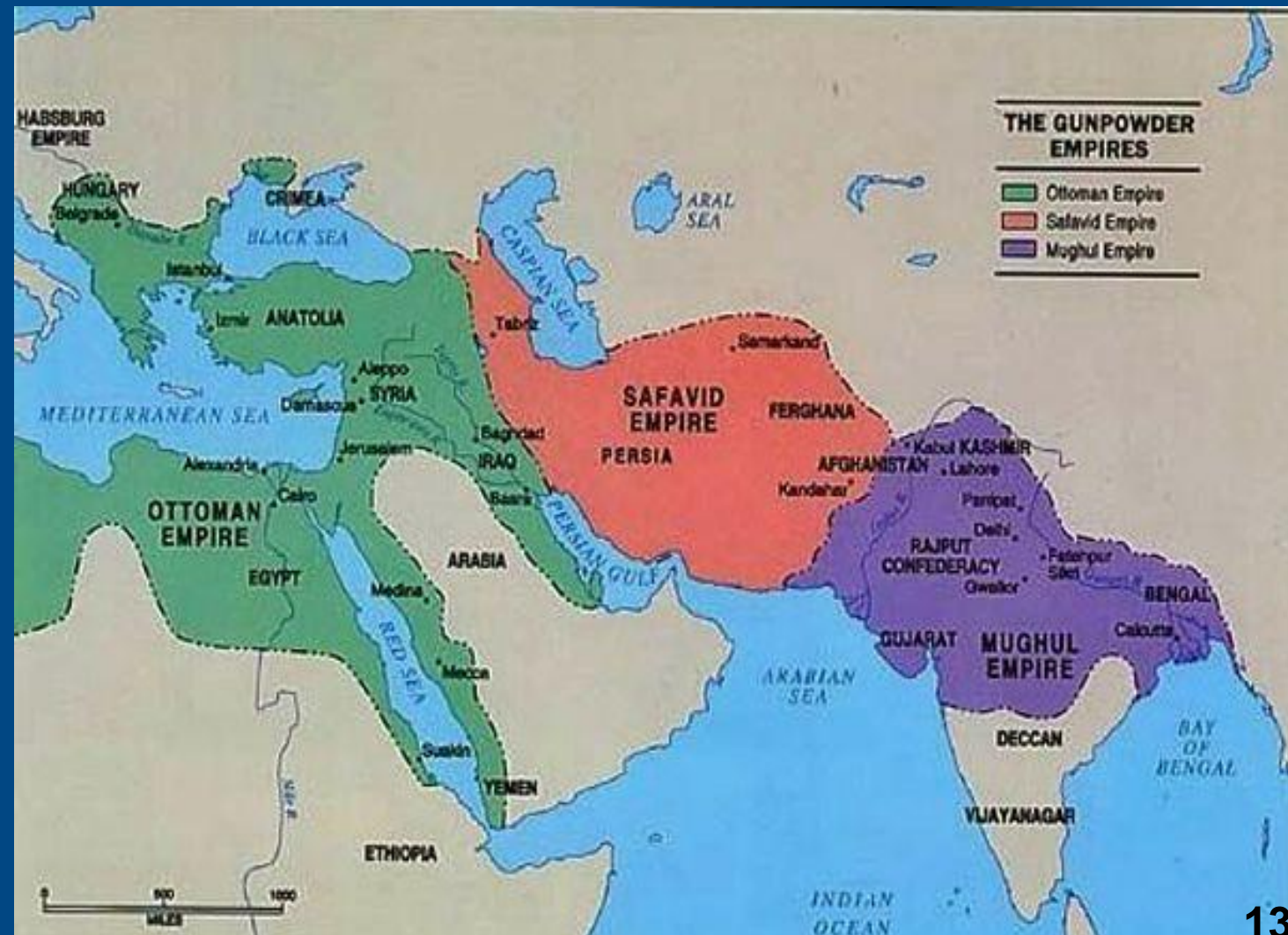
The Evolution of The Instruments of Knowledge and their Impact on National Security

- In 1454 AD, when printing press was invented in Germany and the massification of knowledge was initiated in Europe, the vested interest of Muslim clergy opposed its adoption



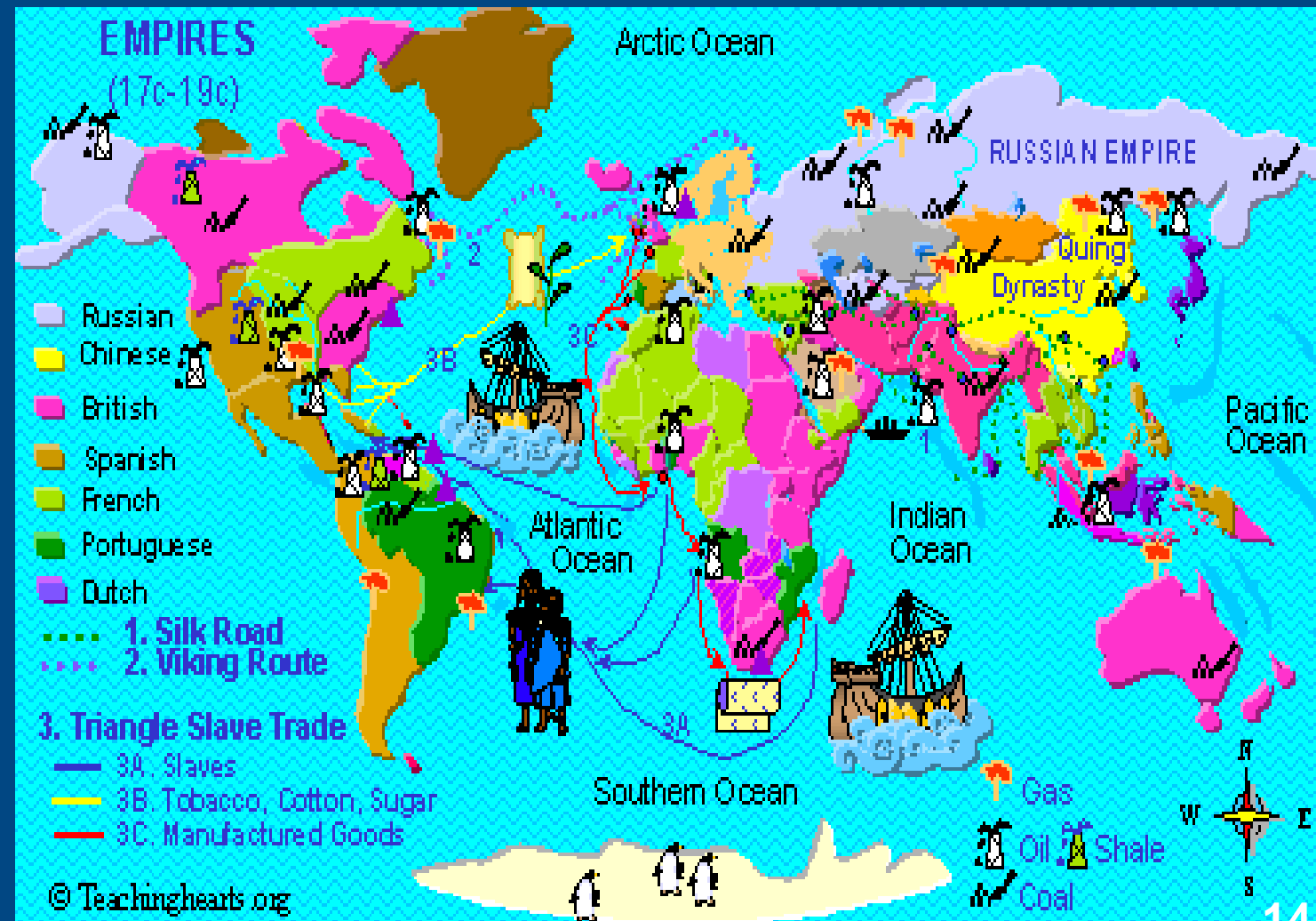
The Evolution of The Instruments of Knowledge and their Impact on National Security

- Muslims were put behind by about 3 centuries due to their lack of progressive thinking.



The Evolution of The Instruments of Knowledge and their Impact on National Security

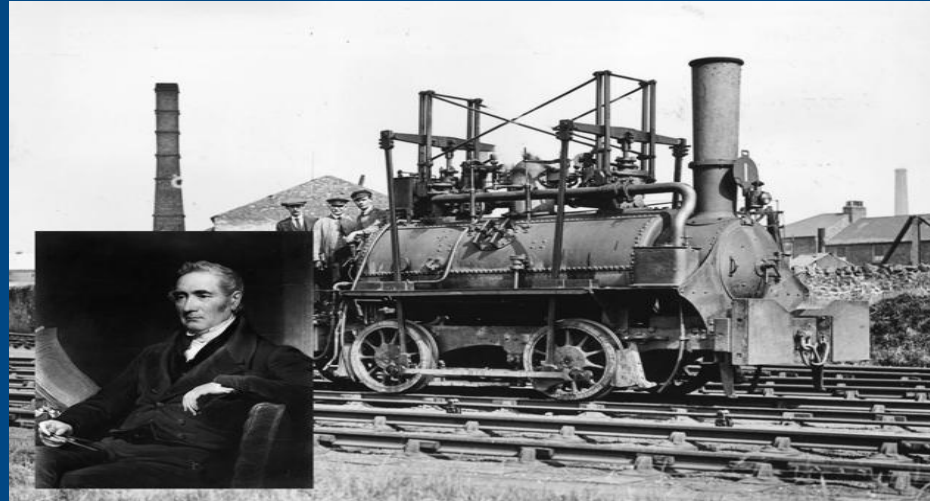
- Europe on the other hand initiated an industrial revolution and emerged as colonial masters of the world, occupying 84% of the globe between 1492 and 1914



The Evolution of The Instruments of Knowledge and their Impact on National Security

First Industrial Revolution: 1784 AD

Steam power & Mechanical Production



Second Industrial Revolution: 1870 AD

Electricity, Mass production, Labor skills



The Evolution of The Instruments of Knowledge and their Impact on National Security

Third Industrial Revolution: 1969 AD

Electronics & IT initiated automated
Production



Fourth Industrial Revolution

Industrial-cum -informational revolution,
biotech, space technology



The Evolution of The Instruments of Knowledge and their Impact on National Security

- The French Revolution of 1789 AD and the subsequent rise of Napoleon to power led to many wars in Europe.

Bastille 1789 AD



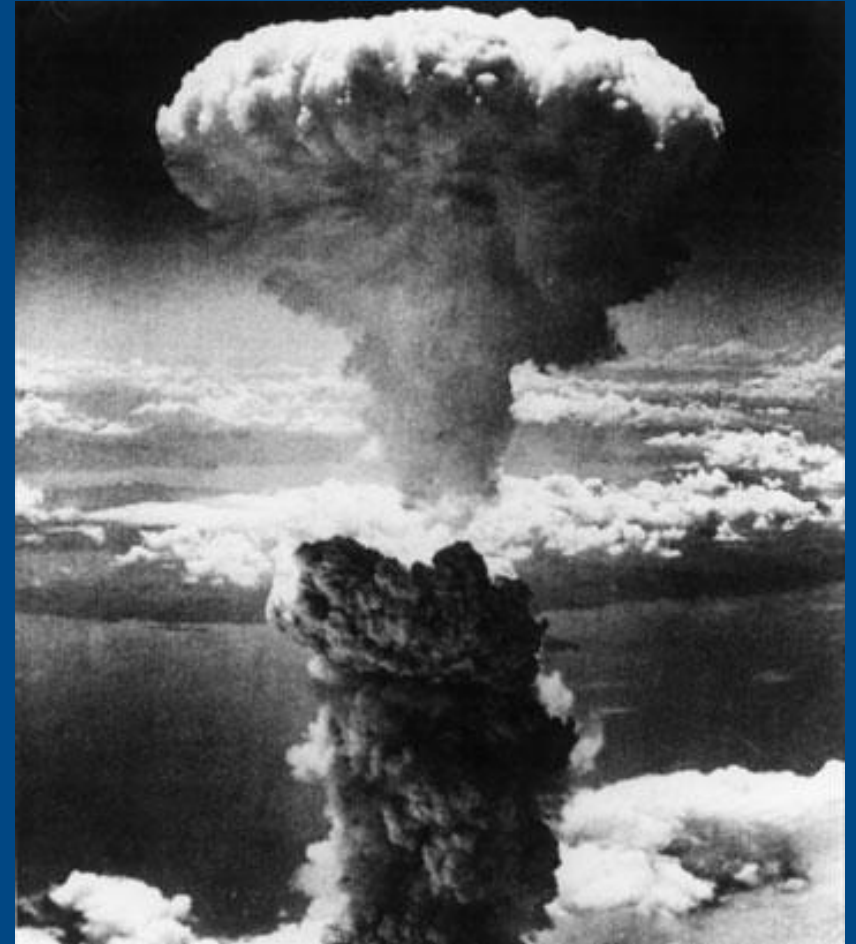
The Evolution of The Instruments of Knowledge and their Impact on National Security

- World War I and Russian Revolution of 1917 sowed the seeds of WW-II (1939-45), that was even more devastating.



The Evolution of The Instruments of Knowledge and their Impact on National Security

- It terminated with another technological revolution, the advent of nuclear weapons, that equalized adversary's superiority in conventional forces



The Evolution of The Instruments of Knowledge and their Impact on National Security

- It **prevented conventional wars** between nuclear powers, but **created many proxy wars** and internal wars cum revolutions elsewhere.



Korean War (1950-53)



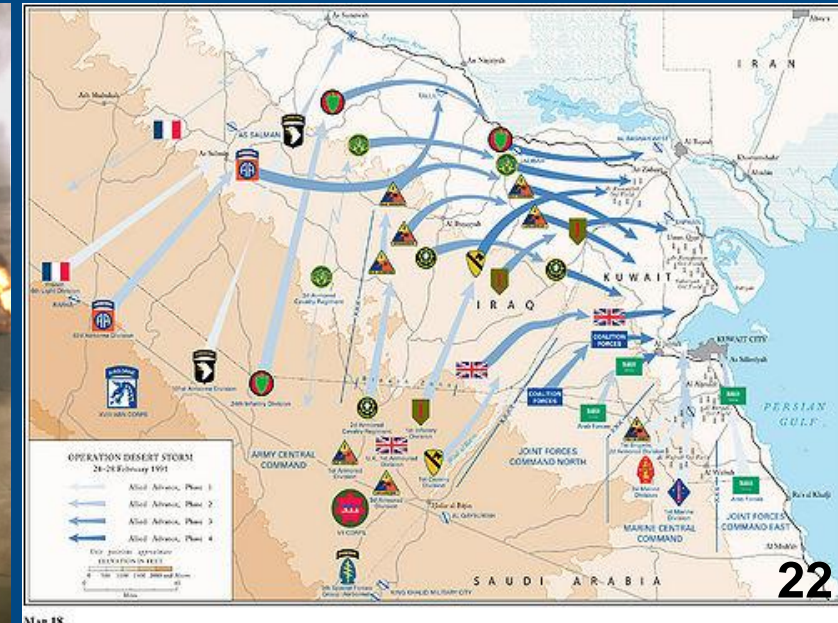
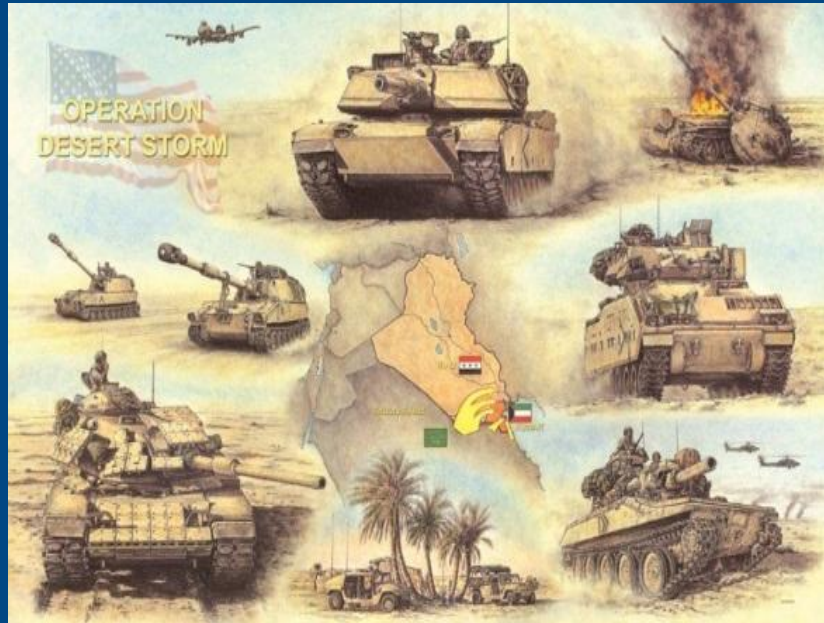
Vietnam War (1964-74)



Afghan War (1979-89)

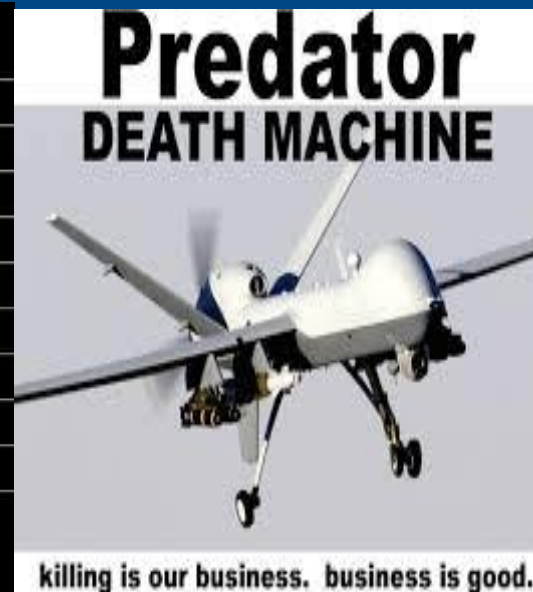
The Evolution of The Instruments of Knowledge and their Impact on National Security

- The era of unipolar world was inaugurated in 1990-91 by the US Invasion of Iraq.



The Evolution of The Instruments of Knowledge and their Impact on National Security

- The ongoing global war on terrorism and Revolution in Civil Military Affairs have virtually created a new security paradigm now.



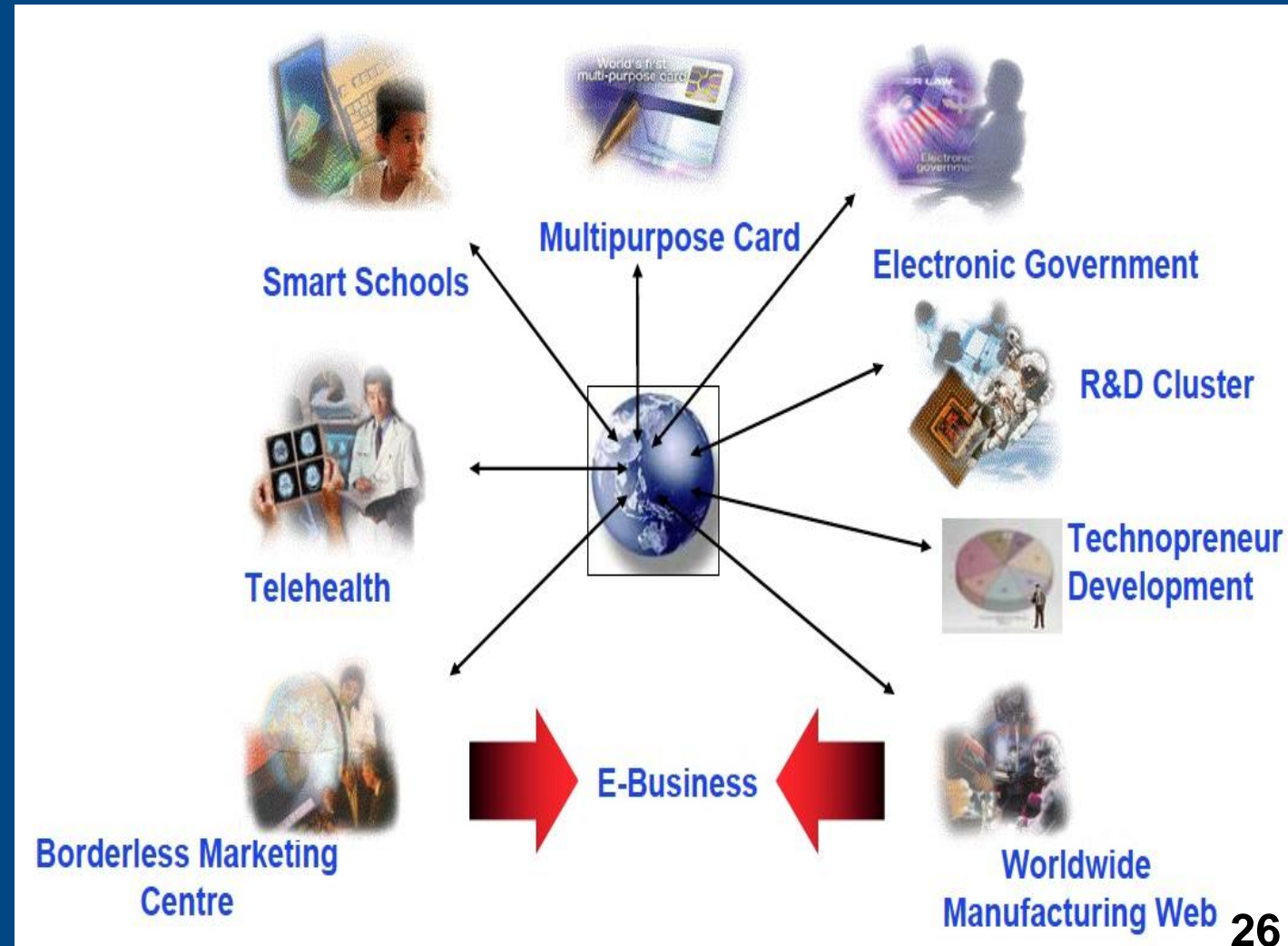


The New Security Paradigm



The New Security Paradigm

- Information Communication Technologies (ICT), especially the internet, are helping to massify knowledge, like the printing press did before



- [illegible]

The New Security Paradigm

A New Era of Globalization

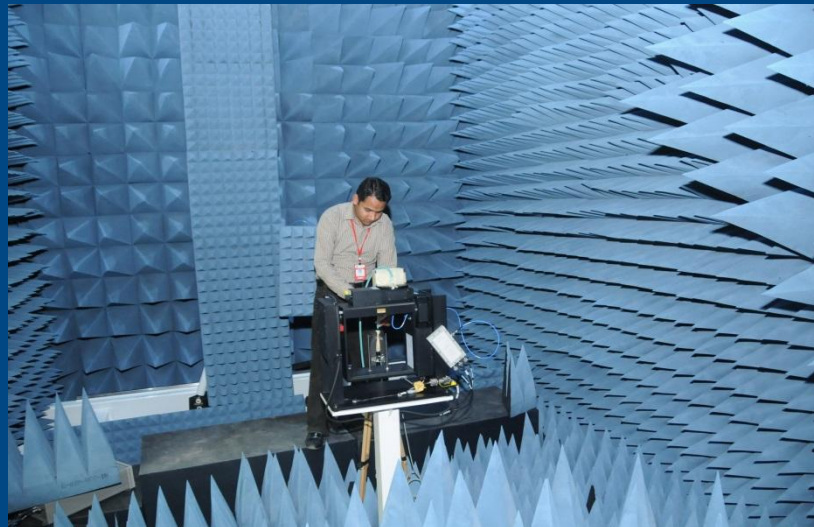
- ICT Supported publications are helping in massive Growth of knowledge



The New Security Paradigm

A New Era of Globalization

- Since mid 1990s **investment in knowledge** has grown more rapidly than investment in machinery and equipment in most OECD countries



The New Security Paradigm

- Creating, developing and diffusing new products and processes requires strong science and technology skills and many non-research soft and entrepreneurial skills



The New Security Paradigm

- The share of **high-tech manufacturing** in the overall GDP growth has increased many times in OECD countries and also in some of the emerging economies, especially China



The New Security Paradigm

- **Research, Innovation and Commercialization** of cutting edge technologies has given universities and academia a centre stage in the growth strategy across the globe



The New Security Paradigm

- The ICT supported economy and society have more than **doubled rate of productivity growth** in the US during 1996-2005, as compared to that of 1975-95.



The New Security Paradigm

Globalization

- In 2015, **international tourists** registered a record number of 1.2 billion.
- Refugees are in addition and it is having security implications now



The New Security Paradigm

International Trade

- There is a significant increase in the *share of high-tech goods* in international trade which shows the *impact of knowledge inputs*.



The New Security Paradigm

Globalization

- **International capital flows (Gross cross-border capital flows):** rose from about 5% of world GDP in the mid 1990s to about 20% in 2007



The New Security Paradigm

- **1994 Human Development Report**, bridge the freedom from want (or poverty) and freedom from fear (or violence).
- **Seven dimensions of human security:** personal, environmental, economic, political, community, health, and food security



The New Security Paradigm: The Conflict Spectrum

General *Nuclear War*

Limited *Conventional war* with an outside Enemy

Internal war supported by outside actors/State failure/disintegration

Terrorism/Political unrest with transnational support

Failure of Governance/Corruption/Crime/Transnational linkages

Natural disasters/Pandemics/Environmental degradation/crop failure due to *climate change*

Human Rights violation/reduced economic opportunities/poverty/
social change compelled by new knowledge inputs

Characteristics of 4th Generation War

- It blurs lines between *war and politics*, *conflict and peace*, *soldier and civilian*, and *battlefield violence and safe zones*.
- It has arisen from *the loss of nation-state's control of violence* and its inability to prevent ingress of dangerous ideas and technologies from outside.
- The *target of 4th Generation War* are not just military but the *entire country* and all state systems and structures.
- *Media is a strong weapon* in the hands of the merchants of chaos and destruction



THE ROLE OF UNIVERSITIES IN THE NEW KNOWLEDGE ECO-SYSTEM



THE ROLE OF UNIVERSITIES IN THE NEW KNOWLEDGE ECO-SYSTEM

- The new knowledge econ-system is dominated by creativity, innovative thinking and competencies to solve complex and wicked problems.
- The 21st century learning outcomes demand a multi-disciplinary approach with focus on competencies rather than skills

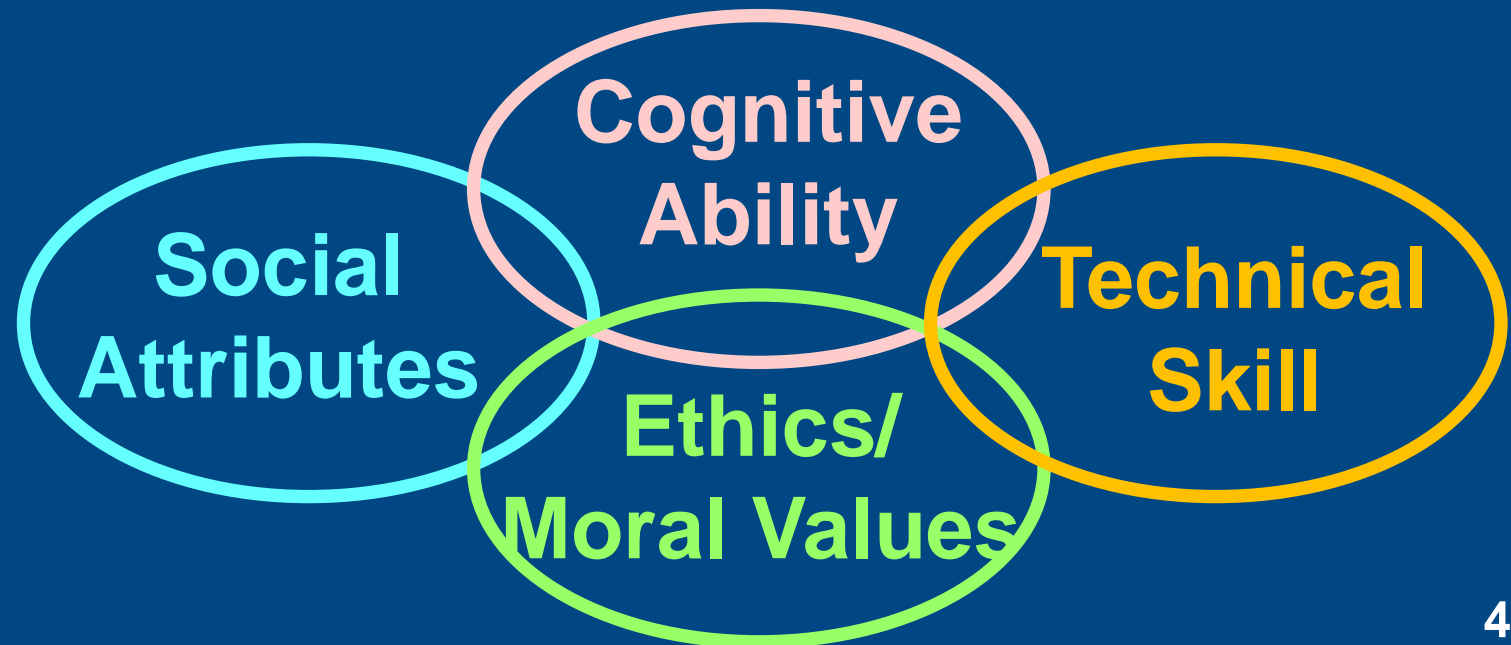
THE ROLE OF UNIVERSITIES IN THE NEW KNOWLEDGE ECO-SYSTEM

Skill



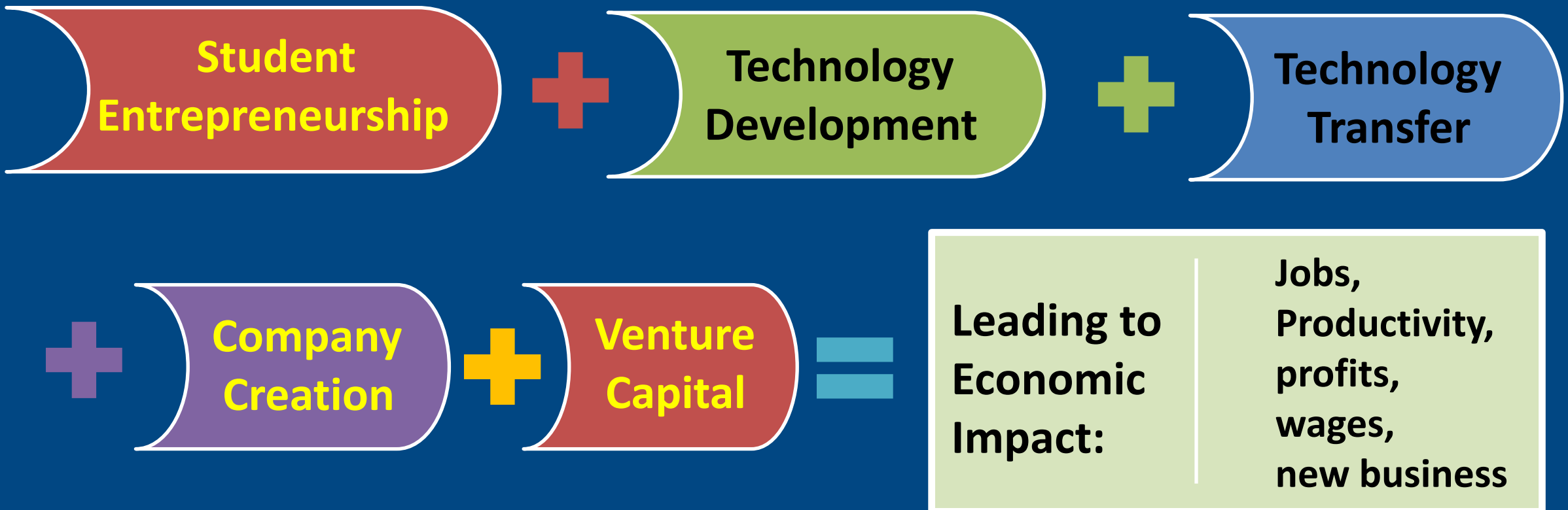
Competency

Ability to Perform tasks
& solve problems

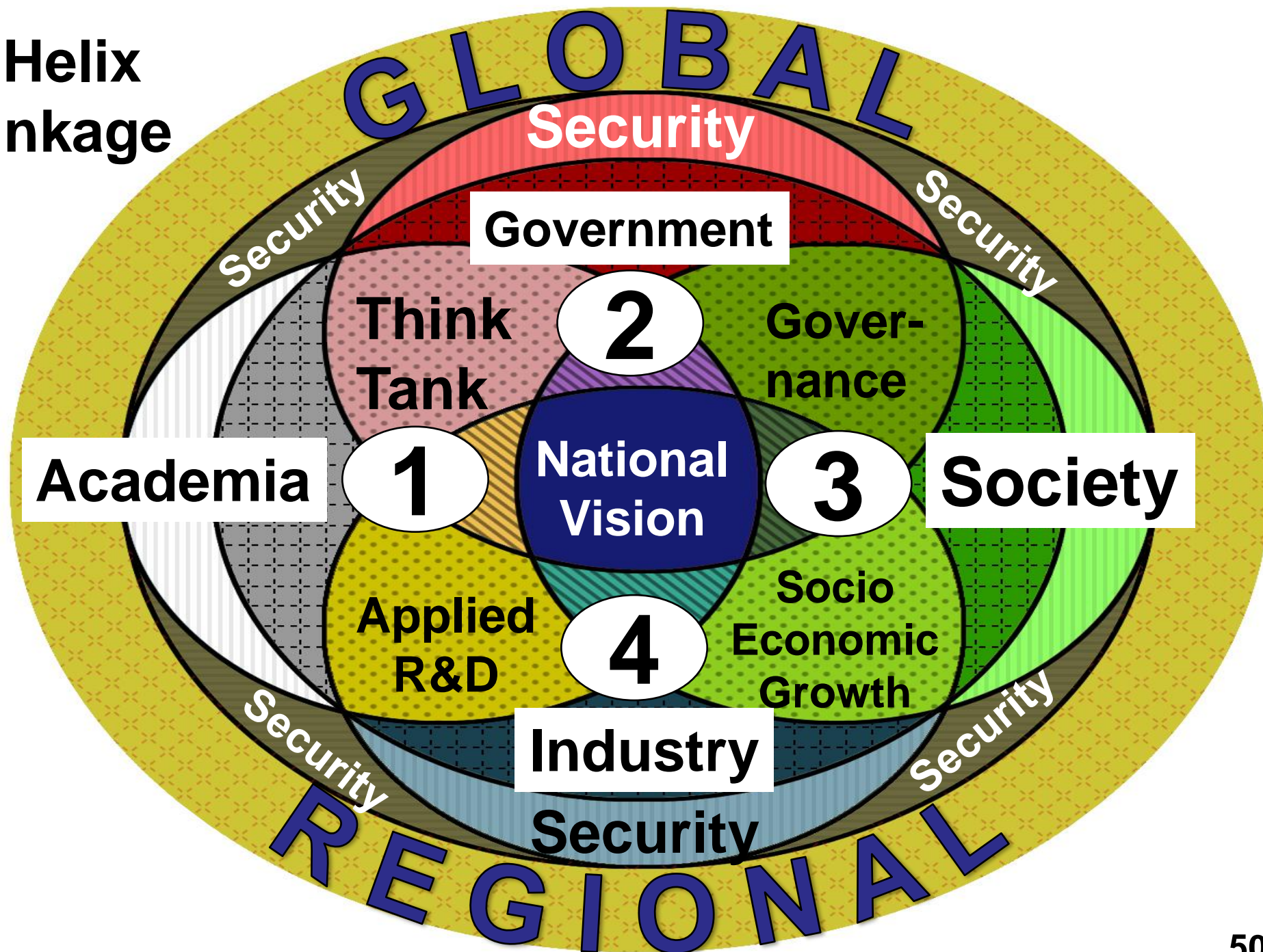


THE ROLE OF UNIVERSITIES IN THE NEW KNOWLEDGE ECO-SYSTEM

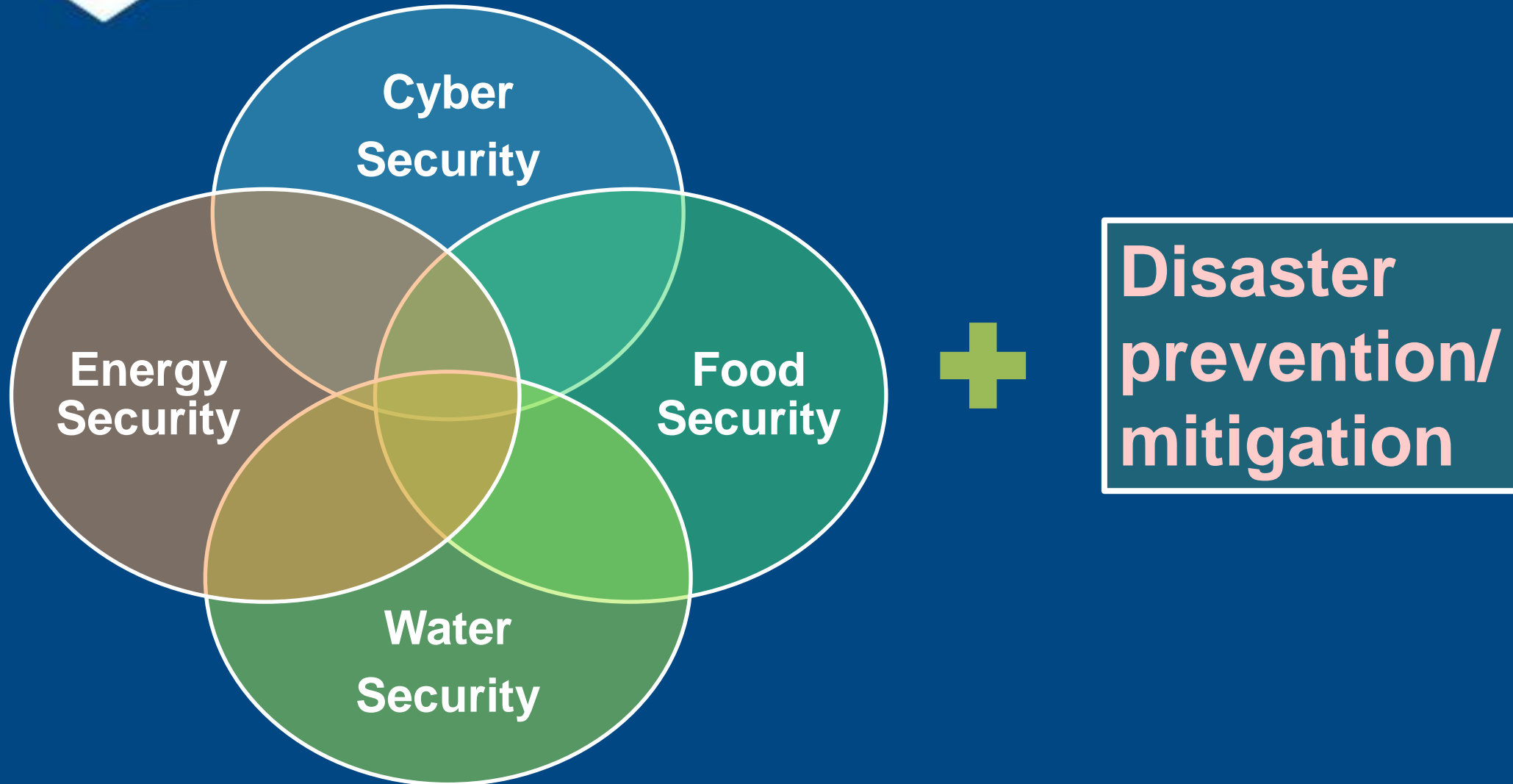
Entrepreneurship Pipeline



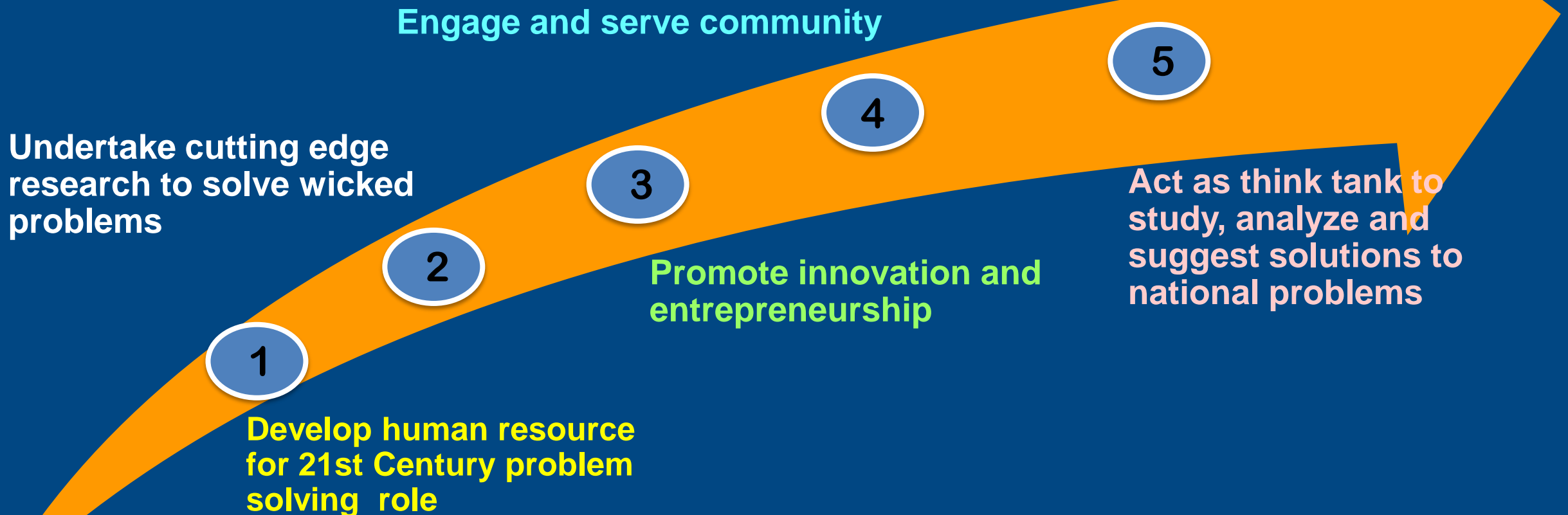
The Quadruple Helix Model And its linkage With Security



THE ROLE OF UNIVERSITIES IN THE NEW KNOWLEDGE ECO-SYSTEM



The Role of Universities in the New Knowledge Eco-System





CONCLUSION



Thank you!