Theoretical Overview of University-Industry Collaborations(UIC)

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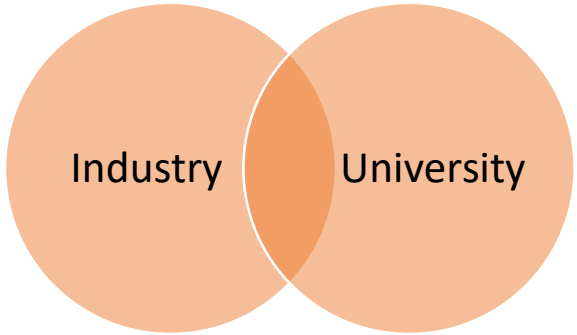
University- Industry Collaborations

- A big leap.
- Discovery-Academic driven culture of the university.
- Innovation-Commercialization driven environment of the company.
- When it works well it is a win-win situation for both parties.
- In addition other stakeholders also benefit.



What are the themes of Success Stories in UIC?

University Industry Collaboration- Theme 1

Theme 1: Collaboration that impacted the technology and innovation with in Industry(Davey et al., 2011)

- Technology and Innovation key for competitive advantage for the Company.
- Technological Capability is either build within or external to the Organisation.
- Universities can help generate, adapt, diffuse and disseminate technology
- Universities can help in Innovation Management.
- E.g. NOKIA-AALTO UNIVERSITY[1] , UC Berkeley.

1Source: http://www.aalto.fi/en/current/news/2018-06-21-003/

Davey, T., Baaken, T., Muros, V. G., & Meerman, A. (2011). The state of European University-business cooperation: Final report–study on the cooperation between higher education institutions and public and private organisations in Europe. *Science-to-Business Marketing Research Centre*

University Industry Collaboration- Theme 2

Theme 2: Collaboration that impacted Teaching, Learning & Research

- Professors join a project inside the company and researchers agree to lecture *(Edmondson et al.,2012).*
- Groundbreaking experiment in developing new skills for a next-generation workforce *(Dawson & Golding,2017).*
- E.g. MICROSOFT-CISCO-INTEL-UNIVERSITY OF MELBOURNE: (ATC21S – Assessment and Teaching of 21st Century Skills).

Dawson, S., & Goulding, J. S. (2017). Shaping Tomorrows Built Environment: Driving Innovation Through Higher Education Engagement. *WELCOME TO DELEGATES IRC 2017*, 587.
Edmondson, G., Valigra, L., Kenward, M., Hudson, R. L., & Belfield, H. (2012). Making industry-university partnerships work: Lessons from successful collaborations. *Science Business Innovation Board AISBL*, 1-52.
https://education.unimelb.edu.au/arc/projects/completed/2012/atc21s

University Industry Collaboration- Theme 3

Theme 3: Collaborations that develop new funding streams

- Collaborations that generate income on a grander scale and self-sustaining manner (DeCock,2014).
- E.g. Imperial Innovations Group - Journey from a technology transfer office of Imperial College, London to a listed company

De Cock, R. (2014). CASE STUDY 1: A Look Inside Imperial College's TTO. In *Effective technology transfer in biotechnology: best practice case studies in Europe* (pp. 5-18)
https://www.imperialinnovations.co.uk

University Industry Collaboration- Theme 4

Theme 4: Collaborations that developed new role for the Research University

- Research university.
- Novel, large-scale strategic partnerships, based on a matching mechanisms.
- E.g. University of California - Industry-University Cooperative Research Program (IUCRP) - matching grants to catalyse hundreds of strategically focused partnerships (Mowery et al.,2015;Edmondson et al.,2012)

Mowery, D. C., Nelson, R. R., Sampat, B. N., & Ziedonis, A. A. (2015). *Ivory tower and industrial innovation: University-industry technology transfer before and after the Bayh-Dole Act*. Stanford University Press
Edmondson, G., Valigra, L., Kenward, M., Hudson, R. L., & Belfield, H. (2012). Making industry-university partnerships work: Lessons from successful collaborations. *Science Business Innovation Board AISBL*, 1-52.

University Industry Collaboration- Theme 5

Theme 5: Strategic Collaborations

- They usually begin small and decidedly non-strategic.
- Difficult to tell a deal has the potential to go strategic, or wither and die?
- Therein lies the skill of the Academicians & administrators
- E.g. IBM-ETH ZURICH …. Decades of research collaboration between ETH Zurich and IBM led to the creation in 2011 of the $90 million Binnig and Rohrer Nanotechnology Center (Sciacca and Curioni,2018)

Sciacca, C., & Curioni, A. (2018). Building Global Innovation Ecosystems though Public Private Partnerships: How IBM has Leveraged Academic Collaboration for 70+ Years. In *Strategic Industry-University Partnerships* (pp. 59-79).

University Industry Collaboration- Theme 6

Theme 6: Collaborations that address Socio-Economic issues.

- Collaborations that that can impact the Social Capital (Al-Tabbaa and Ankrah ,2016).
- Collaborations that address social challenges.
- Collaborations that address Social inclusive Innovations
- E.g. Wayamba University of Sri Lanka (Technology of preserving coconut apple, Preserving Tuna which benefitted the locals)[1]

Al-Tabbaa, O., & Ankrah, S. (2016). Social capital to facilitate 'engineered'university–industry collaboration for technology transfer: A dynamic perspective. *Technological Forecasting and Social Change*, *104*, 1-15.
1. https://openknowledge.worldbank.org/bitstream/handle/10986/24540/9781464809224.pdf?sequence=2

Research Propositions – Within Case Analysis◊

Research Proposition 1: *UIC may promote technology and innovation within the collaborating organization leading to better products and services*.

Research Proposition 2: *Teaching, Learning & Research within the University will be improved due to production and dissemination of industry oriented knowledge due to UIC.*

Research Proposition 3: *UIC may help Universities to innovate for generating new self -sustaining funding mechanisms.*

◊ Yin, R. K. (2011). *Applications of case study research*. Sage.

◊ Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *The Academy of Management Journal*, *50*(1), 25-32.

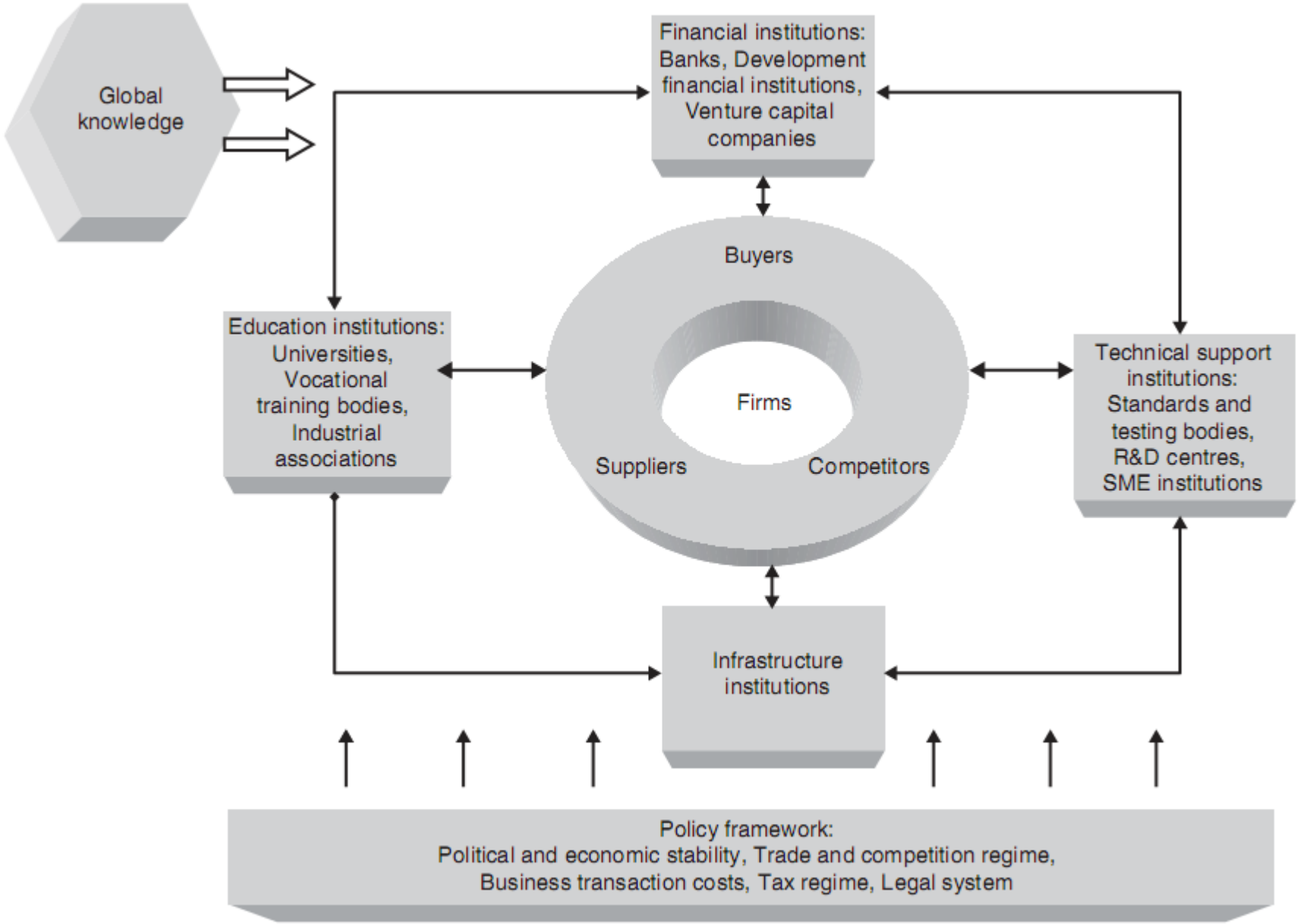
Research Propositions – Within Case

Research Proposition 4: *Strategic conceptualization of UIC may lead to a Research University.*

Research Proposition 5: *Long-term UIC in strategic areas may help in academic entrepreneurs and entrepreneurial academics*

Research Proposition 6: *UIC may help in addressing socio-economic issues.*

What are theoretical models of University – Industry Collaborations?



Lundvall, B. A. (1992). National innovation system: towards a theory of innovation and interactive learning. *Pinter, London*.
Wignaraja, G. (2003). *Competitiveness Strategy in Developing Countries: A Manual for Policy Analysis* (Vol. 30). Routledge.

National Innovation Systems Model

Three Levels for NIS

- First level is made up of the industrial clusters within a country (producers, buyers, suppliers, competitors).
- Second level consists of a set of institutions and organizations which support the industrial clusters.
- Final level is the set of policies that stimulate the learning processes between industrial clusters and institutions.

NIS in Developing Countries: A Paradigm Shift

- In advanced countries it is used for R & D and Competitive advantage.
- Developing countries socioeconomic sustainability, poverty alleviation and resilience (Lundvall et al.,2009)
- Alleviate poverty by involving local communities.
- Develop and disseminate affordable and adapted innovations.
- Local socio-cultural inclusiveness in innovation (Sillitoe,2009).

Lundvall B., Joseph K., Chaminade C., Vang J. (Eds.), Handbook of Innovation and Developing Countries: Building Domestic Capabilities in a Global Setting, Edward Elgar, Cheltenham, UK (2009)
Sillitoe P., Marzano M. Future of indigenous knowledge research in development, Futures, 41 (2009), pp. 13-23

NIS in Developing Countries: A Paradigm Shift

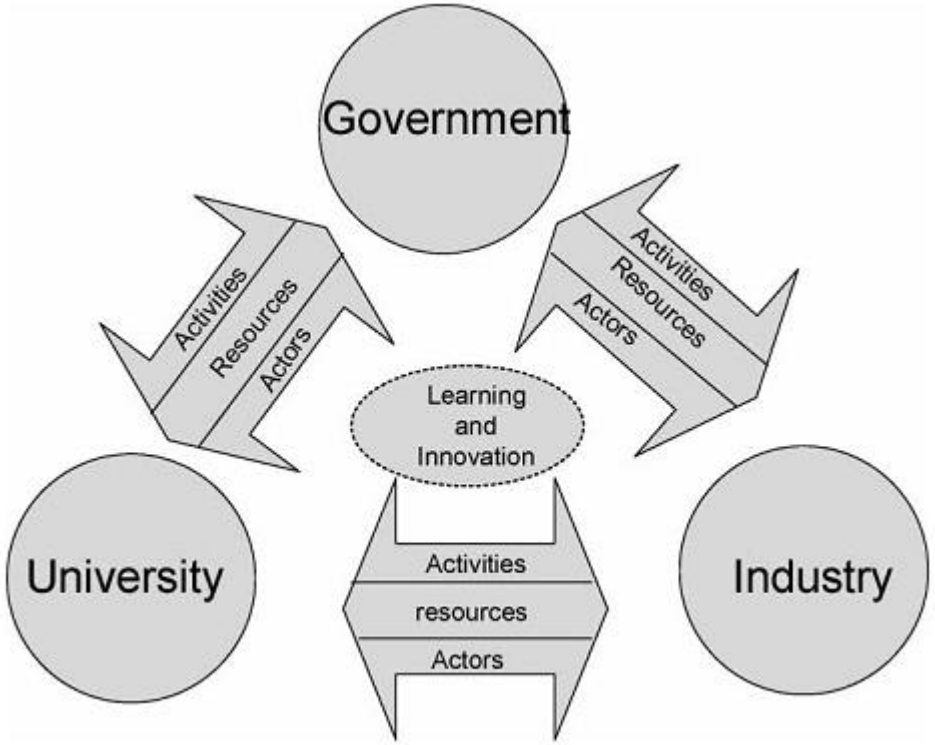
- Indigenous Knowledge (IK) in an innovation policy.
- Socially and economically marginalized local people have the capacity to use IK for innovation development (Domfeh,2007).
- IK can be utilized either as it is or by blending or bundling it with the knowledge of others into product and service innovations (World Bank,2010).

Domfeh K.Indigenous knowledge systems and the need for policy and institutional reforms Tribes and Tribals, 1 (2007), pp. 41-52
World Bank Innovation Policy. A Guide for Developing Countries World Bank, Washington, DC, USA (2010)

Triple Helix Model

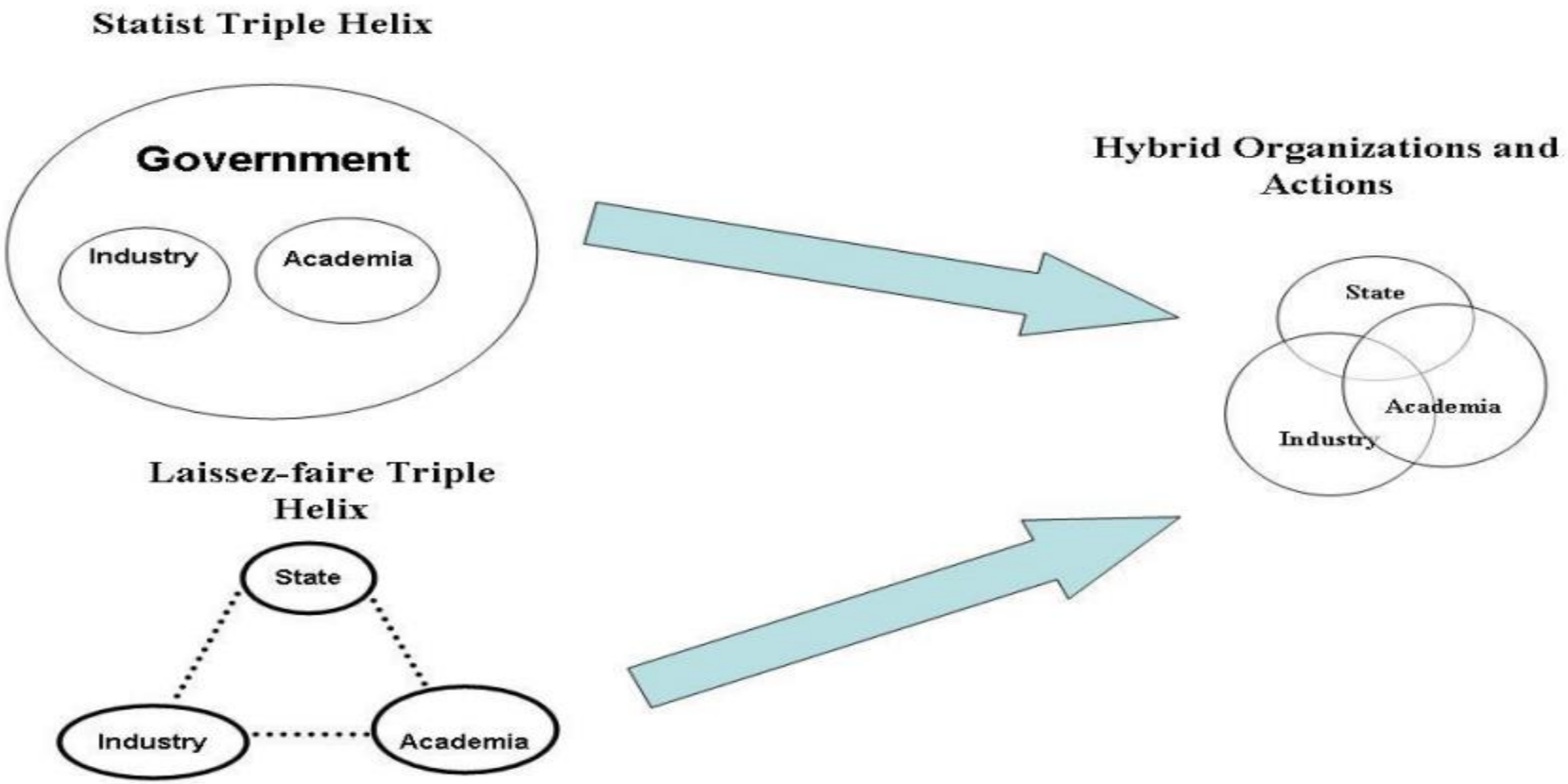
Triple Helix Model (University – Government – Industry Interaction)

- Innovation is a complex process, which involves a multiplicity of actors and activities and has implications for resources.



Etzkowitz, H. (2008), Triple Helix Innovation: Industry, University, and Government in Action, London and New York: Routledge.

Triple Helix Perspective



Etzkowitz, H. (2008), Triple Helix Innovation: Industry, University, and Government in Action, London and New York: Routledge.

Fourth/ Quadrupole Helix System

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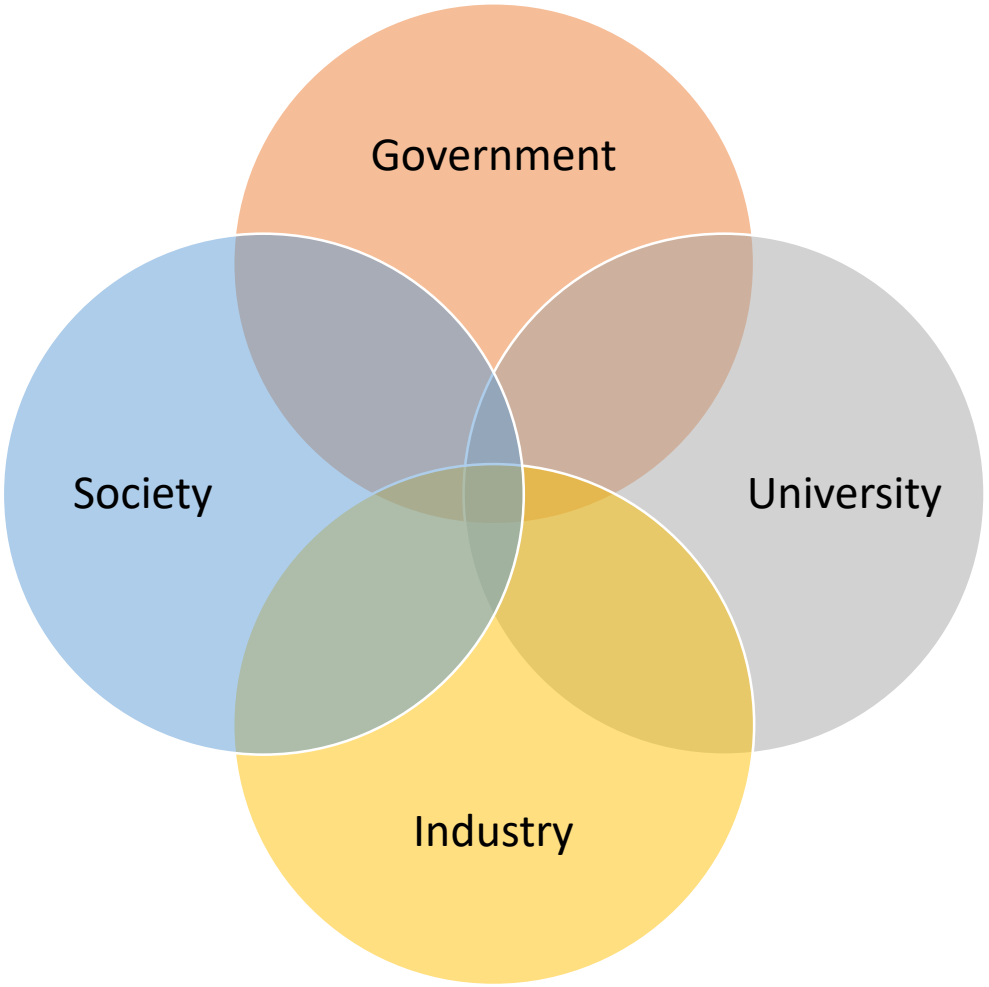

Leydesdorff, L. (2013) Triple Helix of university-industry-government relations. In: Carayaniss, E.G. (ed.), Encyclopedia of Creativity, Invention, Innovation and Entrepreneurship.New York, NY: Springer. pp. 1844–1851

Carayannis, E. G., & Campbell, D. F. (2009). 'Mode 3'and'Quadruple Helix': toward a 21st century fractal innovation ecosystem. *International journal of technology management*, *46*(3-4), 201-234.

Moving beyond the quadruple helix innovation model

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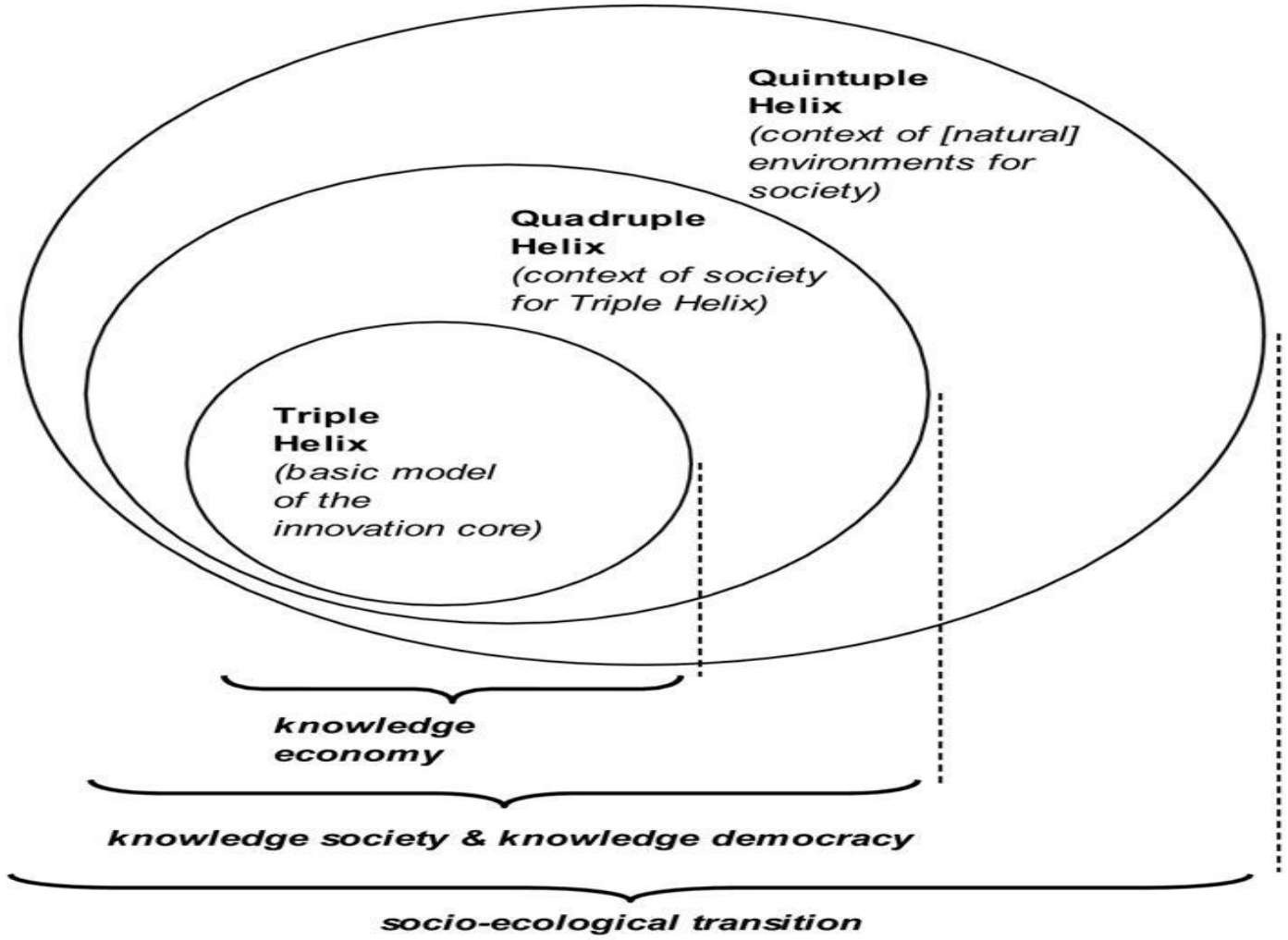
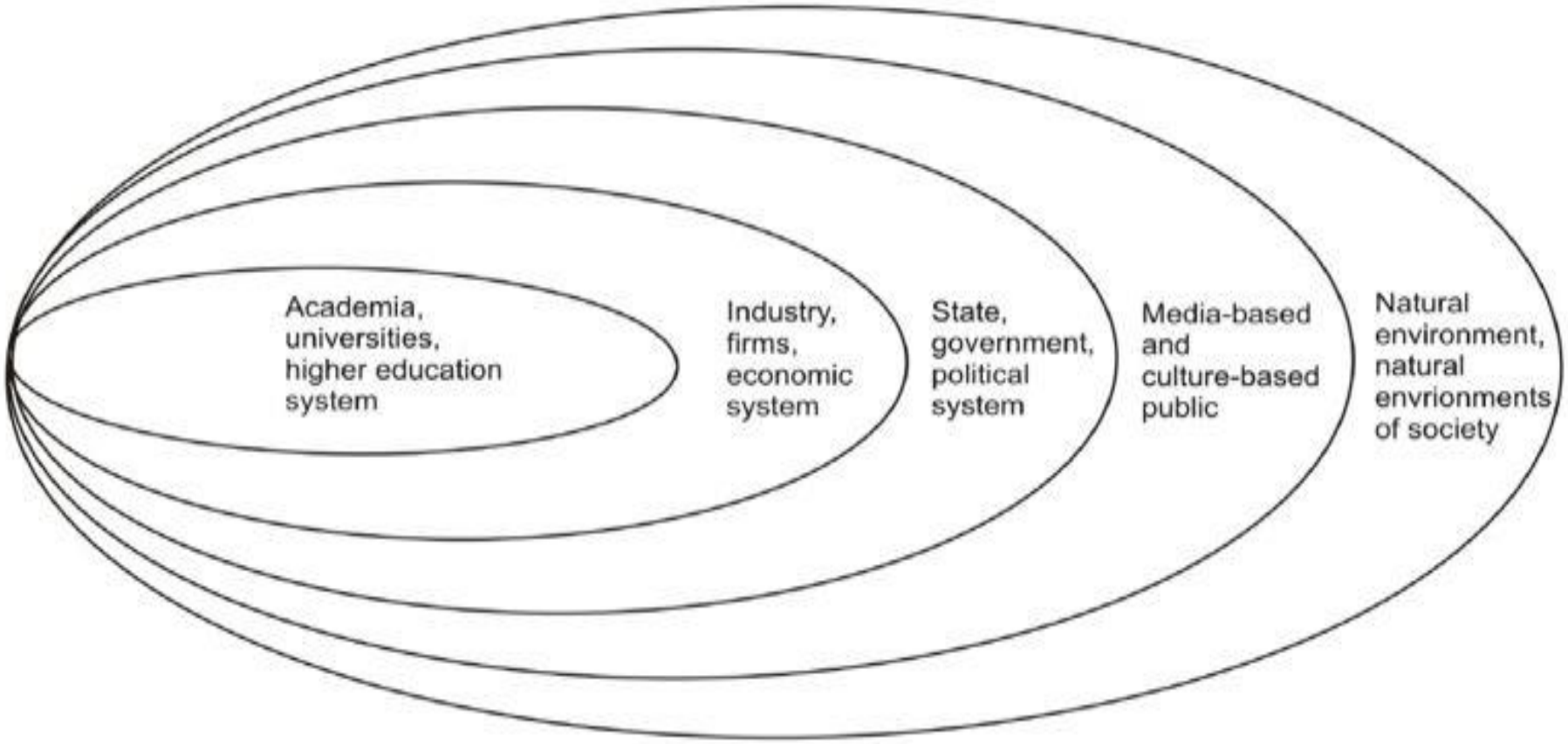


Carayannis, E. G., Barth, T. D., & Campbell, D. F. (2012). The Quintuple Helix innovation model: global warming as a challenge and driver for innovation. *Journal of Innovation and Entrepreneurship*, *1*(1), 2.

Moving beyond the quadruple helix innovation model- Subsystems



Thank you….