Origins of Research

Curiosity-driven research: How innovation is induced in different environments, such as design labs, high-growth firms, manufacturing and service industry, and public institutions?

Stakeholders-driven research: How to design a qualitative change in the system of financing and managing innovation through pan-European collaborative partnerships in order to create economic and social value (growth and jobs)?

Necessity-driven research: How to develop a radically new model of innovation for knowledge-driven economies struggling with economic crisis?
Thesis

Propensity to induce innovation in a global environment characterized by organizational networked structure depends on the capacity to integrate research, education and innovation carried out in a multitude of settings with entrepreneurship as a driver of the output and impact in value creation, value being defined in economic terms and in social terms.

The analysis of the innovation networks can be derived from the analytical framework of networks distinctive for the network society and economy in the age of informationalism.

While there are different models of value creation processes, an operational unit driving this processes is a network enterprise (an organizational form of an enterprise functioning in networks of innovation networks).

Definitions

**Innovation** is a social process of knowledge production and dissemination, during which human creativity leads to translating knowledge into shared, collective capacity to develop new products and processes and to bring them to the markets and to the society, thus creating value in economic and social terms.

**Innovation network** is a form of social organization characterized from its naissance by formation of a global networked structure composed of uncountable, interrelated, multilayered, and multidimensional social networks which have capacity to innovate. This collaborative partnership is enabled by the networking capacity, which comes from the combination of an old organizational form – networks, with new digital networking technologies, that allowed speed, volume, complexity and real-time interaction.

**Entrepreneurship** as a project-oriented activity through which new products and processes are brought to markets and to the society.
Methodology and Research Design

Stage I (2008-2009)
- Immersion and observations of diverse innovation environments in Europe and the US
- Interviews with academics, policy makers, innovation practitioners and entrepreneurs
- Experimental implementation of the theoretical model

Stage II (2010-2011)
- Review of literature
- Conceptualization of a theoretical model

Stage III (2011-2012)
- Recalibration of the model
- Characterization of a specific type of innovation network
- Distilling learning and policy guidelines

Case-based Empirical Research Stream

Theoretical Research Stream

Research Question

Knowing that innovation and entrepreneurship are the sources of effectiveness of collaborative partnerships (or innovation networks) does not solve the problem where innovation comes from.

The research questions are:
1. How are innovation generated in current global networked knowledge-driven economy?
2. What are the components of the innovation process in a networked environment conducive to creating economic and social value?
3. What is the relationship between innovation and entrepreneurship in such an environment?
4. What accelerates the flows of knowledge, talent and capital across networks and why do these resources get accumulated in certain nodes?
5. What implications for stakeholders may this research bring?
Book Outline

PART I: Innovating in a Networked World: Knowledge Triangle (model proposition; partnerships between industry and academia; paradigm research-education-innovation; new role of universities) Innovation Networks (structure, characteristics, dynamics; space of places and space of flows; multilayering; typology)

PART II: Entrepreneurial Innovation Networks: Networks and Emerging Business Models (network enterprise; social networking; open innovation; process networks and creation networks); Entrepreneurship: Missing Ling in the Knowledge Triangle (entrepreneurial university; open innovation and industry; venture capital and intrapreneurship)

PART III: Case Studies (Climate KIC; EIT ICT Labs; KIC InnoEnergy)

PART IV: Changing Paradigm: The ‘KIC Model’ (governance, network of co-location centers; emerging business models; new model proposition: entrepreneurship-driven Knowledge Triangle)

Model Proposition 1: from Knowledge Triangle to Multisetting Innovation Network

Research, education and innovation are components of the Knowledge Triangle, which is a model of a specific type of an innovation network characteristic for a network society and economy where innovation is being carried out in a wide number of settings.
Model Proposition 2: Clusters to Networks of Clusters

The analysis of innovation in a networked environment leads to a conclusion that there is a new paradigm of geographically distributed network of clusters (space of places) within and across which flows of knowledge take places (space of flows).

Emerging Business Models: Paradigms for Value Creation

Analysis of social networking sites, open innovation networks, process networks and creation networks allows to distill a common three-dimensional shift in business models in network enterprises: from transactions to trust-based relationships; from tight-knitting to loose-coupling; from mobilizing existing capacities to building new capabilities.

Flows, Network Dynamics and Typology of Nodes

BUT: The model does not explain why value is created and in certain nodes of innovation networks.

There are three kinds of flows in the innovation networks: knowledge, talent and capital. These resources get accumulated in certain nodes of the global networks and accelerate value creation because of multilayering and switching capacity between diverse innovation networks. This explains why certain nodes become mega nodes while others remain peripheral irrespective of investment in research, education and innovation.

Case 1: Climate KIC

- Theme: Climate Mitigation and Adaptation
- A non-profit association incorporated in the Netherlands. Core partners include major companies, academic institutions, and regional agencies, who collectively assign several billion Euros a year to climate activities.
- Business model: value proposition to partners in integrating value chain and building critical mass; sheltered innovation model.
- Activities: for-degree and non-degree education with entrepreneurship component, business incubation and acceleration infrastructure, innovation projects with pre-commercial testing phase at large scale level.
Case 1: Climate KIC

- Theme: Future Innovation and Communication Society
- A non-profit association incorporated in the Belgium. Core partners include major telecom and ICT companies, academic institutions.
- Business model: in development, e.g. pan-European funding scheme for start-ups; ‘soft landing’ scheme for internationalization of start-ups.
- Activities: innovation projects in open innovation environment; for-degree and non-degree ICT education with entrepreneurship component.
Case 2: EIT ICT Labs

- **Theme:** Sustainable Energy
- For-profit non-for-dividend company (Societa Europea) incorporated in the Netherlands. Core 29 shareholders - top industrial organizations, higher education institutions, and special energy industry small and medium size enterprises that complement the value chain.
- 6 Co-location centers in France, Germany, the Netherlands, Poland, Iberia, and Sweden.
- **Business model:** Innovation Highway; education programs
- **Activities:** for-degree programs linking engineering degree with entrepreneurship education; linking innovation projects with partners’ demand for innovation.
Case 3: KIC Innenergy

A ‘KIC Model’

- Consortium of Partners/Shareholders from all sides of the Knowledge Triangle; Public-Private-Partnership
- Thematic link to a societal challenge (alignment with European Union Innovation Policy)
- Legally and financially structured entity
- 7-year Framework Agreement with European Institute of Innovation and Technology
- Pan-European network of co-locations (5-6 nodes) and possibly parallel structure (e.g. Regional Implementation Centers of Climate KIC)
- Business model – towards financial self-sustainability after contract with EIT is terminated
- Entrepreneurship as integrator between research, education and innovation in all programs
Model Proposition: Entrepreneurship-driven Knowledge Triangle

New Paradigm: Entrepreneurship is a critical component, which integrates the Knowledge Triangle and catalyzes economic and social value creation processes; it is epitomized by a strategic shift in academia and in industry and by the presence of entrepreneurial talent and entrepreneurial capital.

Research Findings

The paradigm of the **Knowledge Triangle is conducive to innovation**, and the paradigm of the **entrepreneurship-driven Knowledge Triangle is conducive to value creation**, value being defined at micro and macro levels in economic terms (e.g. equity, GDP), as well as social terms (e.g. social capital, new jobs).
Relevance of Research

Academic community because of its theoretical framework and empirical evidence.

Innovation practitioners operating in the diverse settings of the Knowledge Triangle, including research labs, universities and industry, helping them to better structure their collaborative partnerships in order to induce innovation.

Policy makers as a conceptual framework to design new tools within innovation policies.

EIT and KICs as a source of knowledge for undertaking a critical reflection on the KIC model as such, as well as its implementation.

General public interested to understand the process of innovation, its components, their articulation as supported by strong empirical evidence anchored in Europe context.

Further Research:
Towards a Theory of Innovation

Innovation is a broad term, which contains three specific categories:

- **innovation in the product or system itself**, which denotes the realm of design and content and encompasses new concepts, services, user or customer experiences;
- **innovation in the more general environment such as organizational or institutional context**, within which innovation takes place, which is demonstrated for example in the case of Japan and ‘just-on-time’ manufacturing model, when its fundamental innovation in production systems simultaneously eliminated inventories and their costs, permitted constant quality improvement, and reduced cost (Bar et al, 2001);
- **non-technical aspects of technical innovations**, which are tightly connected to the technical innovation and can significantly increase the adoption of the technology, exemplified for example by the product innovation cycle, that is strictly dependent on the dynamics, features and structure of an industry sector and that the traditional and sequential phases of applied research – innovation - engineering are much more interrelated and often embedded in each other. (EIT, 2009).
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