

The Accelerating Transport Innovation Revolution: A Global, Case Study Based Assessment of Current Experience, Cross Sectorial Effects and Socio-Economic Transformations

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Submission: 📅 October 09, 2019

Published: 📅 October 22, 2019

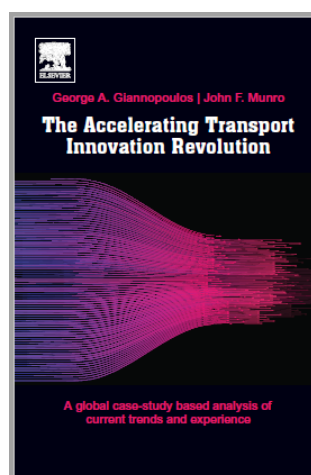
Volume 2 - Issue 3

How to cite this article: GA Giannopoulos, JF Munro. The Accelerating Transport Innovation Revolution: A Global, Case Study Based Assessment of Current Experience, Cross Sectorial Effects and Socio-Economic Transformations. Nov Res Sci.2(3). NRS.000537.2019.
DOI: [10.31031/NRS.2019.2.000537](https://doi.org/10.31031/NRS.2019.2.000537)

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Opinion

In its 390 pages, this book, addresses “innovation”, i.e. the process of translating an idea or invention or research result, into a commercial product or service that creates value for which customers are willing to pay. It does so, through analytical work and a number of case studies. Although it refers primarily to the authors’ experience in the Transport field, its material is widely applicable in all fields and its scope very wide. The book’s basic premise is that the global record for implementing research, to produce innovation, has so far been suboptimal relative to the level of public and private investment devoted to research. It therefore focuses on the critical processes that can push “revolutionary” as well as conventional or “incremental” innovation forward and uncovers the technological, institutional, financial, political and cognitive factors that affect success or failure (Figure).



Figure

In formulating their novel approach to modeling innovation, the authors took as a solid basis on which to work, the mechanisms and processes followed by natural or biological ecosystems. In such systems, living organisms (biotic factors) in a contiguous geographic location together with non-living elements (abiotic factors) are connected within a “biological ecosystem” that depicts well defined and researched mechanisms and processes that ensure equilibrium and sustainability within the inanimate physical environment of the ecosystem. From this basis, several Chapters of the book formulate and put forward key concepts amounting to what can be termed the “ecosystems based model of innovation”. This model views innovation production as a systemic level process directly relevant and analogous to the way biological ecosystems form their outputs and evolve. An “innovation ecosystem” is defined as a system that includes several diverse but relevant elements (organizations, rules, infrastructures), normally geographically proximate, which are involved in the creation

of innovation in a certain field or scientific area in the form of marketable products or services or both.

This conceptualization is tested throughout this book (chapters and case studies) and - in spite the inevitable, at some points, conceptual stretch - it was found to provide a good basis for representing the real-world innovation production processes. Besides the theoretical formulation, the book also examines, the types of innovation system organization and the factors affecting success or failure by looking at the research and innovation systems in major countries and regions in the world as well as other key issues and aspects such as the issues of: innovation spillovers, monitoring and data collection, intellectual property protection, the economics and financing of innovation, the role of the public and private sector and finally the role of visionary individuals in creating and maintaining innovation cycles and innovation ecosystems.

The book provides an excellent forum for researchers as well as innovators and administrators eager to promote innovation (in any field), in order to learn about relevant concepts, ideas and practices throughout the world. Through the material presented and the investigations made in the book, one can get clear answers, or be helped to clarify critical innovation related issues, such as:

- I. What is "innovation", especially the so called "revolutionary" or "transformational innovation";
- II. How can it be produced and facilitated;
- III. What are the factors and conditions of success;
- IV. Models of successful "innovation governance" and funding;
- V. The role of the private sector and of public-private-partnerships, in generating transformational innovation;
- VI. How and under what circumstances do "incremental" innovations, ignite fundamental technological and economic change;
- VII. Why is "revolutionary" innovation limited to a relatively few nations around the world.

There are six levels of analysis at which the book examines the relative issues, namely the:

- a) Systemic or global (international) level, i.e. the one that refers to innovations pursued by major national or international actors who have the power to pursue these innovations globally.
- b) National level, i.e. the level that refers to the strategic and institutional framework for innovation that is in place domestically to facilitate the creation of innovations within a certain country.
- c) Subnational or regional level, i.e. the geographically concentrated level of a region or "zone" at which specific innovation ecosystems are delineated.

d) Firm or organization level, i.e. the level of a specific individual organisation (e.g. commercial company or firm, research institute, or University, etc.), and finally

e) Individual level, *i.e. the* level of the single person (researcher, or entrepreneur) who takes the initiative to proceed with his/her idea or research result to create innovation e.g. through (usually) a start-up company.

Of interest are the so called "enablers" or "attractors" of an innovation ecosystem, i.e. those elements that facilitate and induce innovation within a given innovation ecosystem. We can summarize them as follows:

- a) A well-funded, government-supervised research and development program that is singularly committed to developing solutions to fundamental scientific and technological problems - at a rate sufficient to sustain the innovation pipeline.
- b) A level "playing field" i.e. a non-bureaucratic legal and admin environment that provides sufficient market incentives to support technological risk taking.
- c) An institutional structure that avoids regulatory hurdles that impede the process of innovation and protects the rights of the innovator and technical worker.
- d) A balanced, robust and holistic innovation financing system that accepts innovative entrepreneurs and risk takers.
- e) Broad social and political acceptance of new policy paradigms that are supportive of revolutionary change.
- f) Educational and human resources of high professional standards built on new ideas and favoring innovation.
- g) Existence of strong "cores of attraction" i.e. initial groups of competing and collaborating innovators or innovation related entities of a scale over and above a minimum "critical mass" that is necessary to achieve sustainability.
- h) National structures that favor innovation (possibly revolutionary innovation over incremental change) by, for example, incentivizing the domestic production capabilities in a way that maintains a technological work-force that can produce and commercialize research results.

The ten case studies examined in detail are:

- a) Germany - The Berlin-Adlershof Science City.
- b) Germany - The German Aeronautics, space and Transport center DLR.
- c) Greece - The Athens University of Economics and Business as innovation and entrepreneurial hub.
- d) Israel - The Israeli national innovation promotion structure.

e) P. R. CHINA – A case of government led “innovation promotion system”.

f) UK – The Transport Catapult experiment.

g) USA – The Silicon Valley. A case of a mature world level innovation ecosystem.

h) USA – The Denver, Colorado innovation ecosystem. A case of an emerging regional innovation ecosystem.

i) US, EU – The role of individuals in creating innovation

j) US, EU, China – The role of public and private sector investment.

This book is very well written, it reflects today’s innovation production issues and not only in the transportation field but more generally. It has well-structured text and layout and the case studies provide excellent depth explaining the current practices and what can be learned from them. Would definitely recommend this book for those who are in any way involved or simply interested in the innovation production process, as a must do reading.

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