



Hélice

VOLUME 5 ISSUE 3/4 SEPTEMBER/DECEMBER 2016

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The Triple Helix Association Magazine, *Hélice*, is published quarterly: March, June, September and December. Contributions are invited:

ARTICLES/ESSAYS dealing with aspects of the interaction between academy-industry-government (Triple Helix) for fostering research, innovation, economic competitiveness and growth. Contributions should be in MSWord, 2500-3000 words, **Contact:** devringoktepe@gmail.com and sheila.forbes@strath.ac.uk.

BOOK REVIEWS from publishers and writers/reviewers on new publications relating to Triple Helix themes. Reviews should be original and interesting, should be written clearly and concisely, and 1000-1500 words in MSWord. **Contact:** brancaterra@gmail.com.

NEWS ITEMS related to conferences or events, call for papers, projects, job posting, and any other activity relevant to Triple Helix interactions you/your organization is organizing/have organized. Articles should be in MSWord, no longer than 1000 words, and include web links to any related activity. **Contact:** devringoktepe@gmail.com and sheila.forbes@strath.ac.uk.

Deadlines for submissions to be included in related quarterly issue:

28 February 2017 for March 2017 issue
28 May 2017 for June 2017 issue.
29 August 2017 for September 2017 issue
28 November 2017 for the December 2017 issue

EDITORIAL

Season's Greetings

As the end of 2016 approaches, we would like to welcome you to volume 5, issues 3/4, of the Triple Helix Association Magazine.

Distributed quarterly, *Hélice* reaches over 2500 scholars, policy-makers, and practitioners, and its outreach includes public organizations, universities, and other innovation agents.

As the year ends, we are going through different types of crisis, which should not have been too difficult to foresee but cannot be easily ignored. We are facing political uncertainties, financial crisis, global climate change, depletion of resources, the spread of terrorism, as well as the tragedy of the refugee crisis. Many stakeholders are under pressure to solve these problems, but the issues are complex and much intertwined, that no single organization on its own can solve them.

Although it may appear to have been an unrealistic expectation when designed and applied, we hoped that Triple Helix interactions could provide social and policy innovations to address such problems. Triple Helix relations should be seen as a springboard for social entrepreneurs and communities to expand human ability, and to address problems previously seen as intractable. One of the characteristics of Triple Helix enabled social innovation is that it readily transcends boundaries: organizational, political, sectoral, national, and those between experts and citizens. As a result new spheres, and new sources of innovation would be generated.

The Triple Helix Association is delighted to be invited to organize the First Triple Helix International Summit in Kenya to address developing countries problems. We would like to draw your attention to the forthcoming Summit to be held in Nairobi, Kenya, on 4-6 April 2017, which will address *Accelerating the Attainment of Sustainable Development Goals (SDGs) through ICT and Data*. Things are shaping up nicely for what looks like another stimulating Triple Helix event!

This issue is dedicated to the Heidelberg Conference, and the conference managers, Djordje Pinter and Emanuela Todeva, have provided an eclectic summary of the event. This gives an excellent overview of the debates, presentations, and discussions at the conference including Triple Helix frameworks addressing ecosystem challenges in the 'era of crises'.

We congratulate John H Howard, Todd Williams, Renu Agarwal for their paper *Smart Specialisation as an Engagement and Governance Framework for Triple Helix Interactions* which won the Best Practitioner Case Award at the Heidelberg Conference. In order to stimulate policy learning, we encourage other experts and practitioners to share their practical experiences and programs.

In this issue Maria Ludovica Agro presents her work on *Global Crisis - Searching for Solutions*, and Branca Terra and her colleagues present their views on *The Entrepreneurial University in the Construction of the Science, Technology, and Innovation Legacy (S, T & I): a Proposal from Rio 2016 Olympic Games*.

In addition to publications from the research and practitioner fronts, we are happy to inform you about the activities and progress of the Triple Helix Association Chapters, the Thematic Research Groups, our new Members, and what members have achieved during 2016. We have had a very fruitful and active year for the Triple Helix Association and *Hélice*, and we aim to maintain this success with many more activities.

As the Editor in Chief and Managing Editor of *Hélice*, we encourage you to share your reflections. These will help sustain and extend the innovative dialogue of the Magazine. For further information, or to publish in *Hélice*, please contact us at the emails given below.

On behalf of Triple Helix Association, the President, and all dedicated members, we wish you a pleasant and enjoyable Holiday Season and a happy and productive 2017.

We look forward to welcoming you to the First International Triple Helix Summit in Kenya in April 2017.

Devrim Goktepe-Hulten
(Editor-in-Chief)
devrimgoktepe@gmail.com

Sheila M Forbes
(Managing Editor)
sheila.forbes@strath.ac.uk

December 2016

CALL FOR PRACTICAL CASE STUDIES

Hélice is looking for organizations from its membership constituency and beyond, including governmental institutions, innovation intermediaries or companies, interested in having their Triple Helix interaction experience presented as a case study in *Hélice*.

Those interested should submit an abstract of 1-2 pages by email to the *Hélice* Editor in Chief, Dr Devrim Göktepe Hultén (devrimgoktepe@gmail.com), from whom further information can also be obtained.

Cover: John Howard

SHARE YOUR THOUGHTS

Letters to the Editor

Readers are encouraged to share their views on matters related to Triple Helix issues.

Please send contributions to: Devrim Göktepe-Hulten, Editor in Chief, devrimgoktepe@gmail.com

Letters may be edited for publication.



UNIVERSITY OF NAIROBI, KENYA
4-6 APRIL 2017

CALL FOR ABSTRACTS

Abstract Submission Deadline: 15 January 2017

The First International Summit of the Triple Helix Association (THA) will be held on 20-22 February 2017 at the University of Nairobi, Kenya.

The Summit theme is:

*Accelerating the Attainment of Sustainable Development Goals (SDGs)
Through ICT and Data*
(www.sustainabledevelopment.un.org/topics/sustainabledevelopmentgoals)

We invite all participants to embrace the Quadra Helix approach, and discuss the global challenges from a Multi-stakeholder perspective. We particularly welcome contributions that are multidisciplinary, addressing the complexity of the Sustainable Development Goals (SDGs), proposing how ICT and Data can drive efforts to achieve these SDGs, and what role should governments, industry, universities, and civil society organisations play (The Quadra Helix).

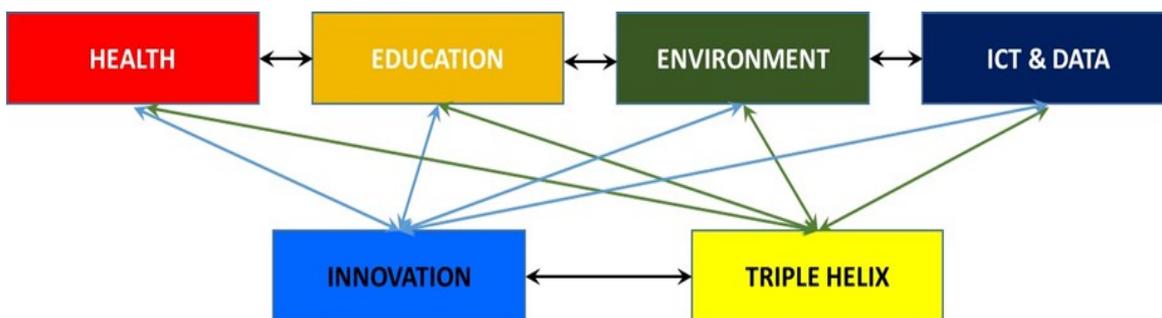
Presenters are encouraged to submit a brief abstract on ground breaking innovations, research, and best practice in Health, Education, Environment and ICT and Data that can turn around the pace of attaining the SDGs.

All Abstracts on innovation and best practice cases will be double blind peer reviewed. Authors of accepted submissions will be invited to present their work at the Summit and abstracts and cases will be included in the programme subject to the successful registration of the participating authors.

Accepted abstracts and cases will be published in the summit proceedings which will be made available at www.triplehelixsummit.org.

All submissions must be made electronically through the Summit on-line submission system (www.conftool.net/triple-helix-summit-2017/) by **15 January 2017**.

Important Dates	
Early bird registration	31 January 2017
Regular registration	28 February 2017
Last minute registration	3 March 2017



www.triplehelixsummit.org

We welcome papers that address one or more of the following areas:

1. HEALTH

- 1.1 Boosting innovation and growth in health care through university-industry co-creation*
- 1.1.1 Service delivery for sustainable development
1.1.2 Healthy workforce for sustainable development
1.1.3 Leadership and governance in health care
- 1.2 Innovations and technology for health systems*
- 1.2.1 Health financing
1.2.2 Health research
1.2.3 Health commodities and technologies
1.2.4 Triple Helix for health service delivery support
- 1.3 Innovations for delivering community health*
- 1.3.1 Best practices and innovations for increasing access to Reproductive, Maternal, Neonatal, Child and Adolescent Health (RMNCAH) services
1.3.2 Refocusing on prevention of Non-Communicable Disease
1.3.3 Sustainable implementation of community health service

2. EDUCATION

- 2.1 Entrepreneurial University - from access and curriculum to regional innovation systems*
- 2.1.1 Education workforce competences analysis
2.1.2 Curriculum reforms for sustainable development
2.1.3 Improving education relevance and pathways
- 2.2 Innovation and technologies for education systems*
- 2.2.1 Improving quality of education through teacher performance management
2.2.2 Improving learning outcomes through ICT and innovation.
2.2.3 Establishing global innovation hubs
- 2.3 Education system responsiveness and resilience*
- 2.3.1 Leadership, governance and accountability for development
2.3.2 Improving equity and inclusion through integration
2.3.3 Financing models for quality education

3. ENVIRONMENT

- 3.1 Environmental sustainability, climate change and information systems*
- 3.1.1 Climate change information system
3.1.2 Climate change commodities and research
3.1.3 Financing of interventions for combating adverse climate change
- 3.2 Innovations and technologies for climate change*
- 3.2.1 Winning business models and partnerships
3.2.2 Renewable and green energy solutions and Triple Helix facilitation
3.2.3 Civil societies actions in safe guarding climate resilience and reduction of CGS emissions
- 3.3 Climate change and resilience*
- 3.3.1 Food security and climate change
3.3.2 Production competitiveness of small scale farmers
3.3.3 Technology commercialization in production, value addition and marketing

4. ICT and DATA

- 4.1 Data roadmaps for sustainable development and Triple Helix responsibilities*
- 4.1.1 Data for public and private decision making
4.1.2 Knowledge translation platforms
4.1.3 Innovations in civil registration and vital statistics
- 4.2 Innovation and technology ecosystems and Triple Helix*
- 4.2.1 Innovations and technologies for citizen generated data
4.2.2 Frontiers in open data for sustainable development
4.2.3 Improve data quality for sustainable development
- 4.3 Data ecosystem responsiveness*
- 4.3.1 Strengthening interoperability of data systems
4.3.2 Improving data collection and management through electronic systems

PAPER FORMAT

The word limit is 300 words excluding references, tables, charts, graphs and figures. Please use APA referencing style, 12 point Calibri font, and structure your paper using the following headings:

- Aim/purpose
- Rationale
- Research design/Innovation
- Scientific approach
- Key outcomes contributions, including evidence of failure and success in a focus areas
- Conclusions and recommendations

If your paper is theoretical, please use the appropriate headings. Do not include your name or affiliation on your submission so it is ready for double blind peer reviewing. Your paper should be upload as an attached word document on the paper submission system (www.triplehelixsummit.org/call-for-Abstract/).

Participants are invited to join one of the roundtables that are set to advance the development and launch of the Quadra Helix SDGs Acceleration Roadmap. Please, register you participation at www.conftool.net/triple-helix-summit-2017/.

In addition to the formal scientific sessions and the Quadra Helix Groups, we invite participants to propose special events which are relevant and complementary to the thrust of enquiry set out in our Call for Abstracts. If you would like to propose a special event (roundtable discussion, project review session, or an interactive workshop) please, e-mail your proposal to Philip Mbithi (pmbithi@ichooselife.or.ke).

If you have any questions, please email Philip Mbithi (pmbithi@ichooselife.or.ke) or Eric Nyamwaro (enyamwaro@ichooselife.or.ke).

SAMPLE OF ABSTRACT FORMAT

Abstracts Title Must be Title Case in Calibri 12pt

Author Name¹, Author Name¹, Author Name¹ and Author Name²

¹First Affiliation listed with formal organization name

² Second Affiliation listed with formal organization name

ABSTRACT

Your abstract must be no longer than 300 words of text (excluding title, authors and institutions or affiliations, and references). Abbreviations may be used but they must be spelt out in full at the first mention, followed by the abbreviation in parentheses. Your abstract must contain a title, written in Title Case and **bold**, as shown in the title above; all authors/presenters listed with their associated organisations/institutions. This should also be written in title case, as above. Titles, degrees and awards should not be included. The body of your abstract should be written in sentence case, Calibri size 12, left aligned, and must be a maximum of 300 words. Paragraphs should be single spaced, left aligned and a 10 point space should be left between each paragraph. Abstracts that do not conform to this template may be declined.

REFERENCES

Djamin, M and Atmojo, J.P.: *Utilisation of geothermal energy as an alternative solution in overcoming energy crisis in Indonesia* (in Indonesian). Oral presentation in One-day Geothermal Energy Seminar, Universitas Negeri Padang. (2005).

Fridleifsson, I.B.: Human resources in geothermal development. Proc. 17th New Zealand Geothermal Workshop, Auckland, New Zealand. pp. 7 – 11. (1995).

Geological Agency, *Up-to-date status of the Indonesia's energy resources (in Indonesian)*. Presentation for the National Energy Council. (2009).

We look forward to receiving your abstract and contribution

The Secretariat
Triple Helix Summit 2017
Nairobi, Kenya

2016 CONFERENCE REPORT

XIV International Triple Helix Conference

Triple Helix Models of Innovation: Addressing Ecosystem Challenges in the Era of Crises

Heidelberg, Germany

25-27 September 2016

ORGANISING COMMITTEE

Professor Henry Etzkowitz
Chair, Organising Committee
Dr Emanuela Todeva
Chair, Scientific Committee
Djordje Pinter
Conference Manager
Mrs Maria Laura Fornaci
THA Executive Director

Since the first Triple Helix Conference held in Amsterdam in 1996, practitioners and academics have been working together debating on collaborative models and pathways for innovation for prosperity.

The 14th International Triple Helix Conference was held on 25-27 September 2016 in Heidelberg, hosted by the German Cancer Research Centre (DKFZ). The conference assembled over 150 scholars and practitioners from thirty-two countries around the world who focused their discussion and intellectual contributions on *Triple Helix Models for Innovation Addressing Ecosystem Changes in the Era of Crisis*.

The opening plenary raised a number of questions on the multiple global crises and searching for solutions. Dr Dimitri Corpakis, Dr Thomas Kirchhoff, and Laura Henderson, all reported efforts by companies, governments, and individual citizens to contribute to emerging solutions through collaboration, consensus and open space.

HAPPY 20TH ANNIVERSARY !!

The Triple Helix Association celebrated the 20th Anniversary of the Triple Helix Professional Community at the 14th International Meeting in Heidelberg.



Professor Henry Etzkowitz, President THA (r) and Professor Ricardo Viale, Secretary General THA (l) toast the happy occasion



Dr Dimitri Corpakis, former EC, DG Research and Innovation, with Dr Devrim Göktepe-Hultén, Editor in Chief, THA Hélice Magazine

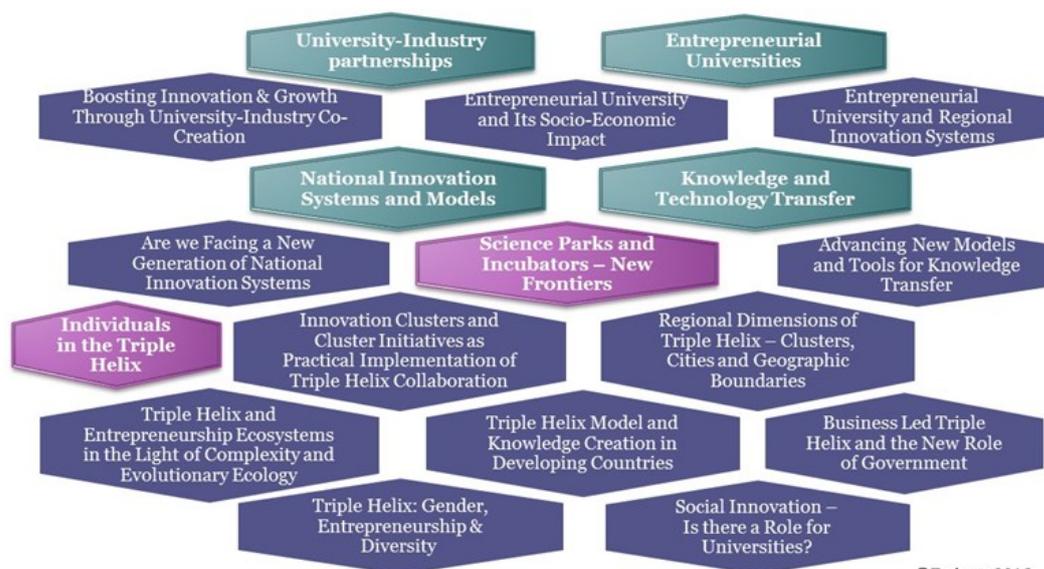
EMERGING SCIENTIFIC FIELDS IN THE TRIPLE HELIX

The discussions were organised into fifteen scientific tracks, three plenaries, three panel discussion forums, two roundtable discussions, and special events. The scientific tracks were moderated by leading academics and practitioners in each field.

Among the most popular tracks were: *Boosting innovation and growth through university industry co-creation; Entrepreneurial university and its socio-economic impact; Science parks and incubators new frontiers; Innovation clusters and cluster initiatives as practical implementation of triple helix cooperation; Social innovation and the role of universities; Business led triple helix; and Individuals in the triple helix.*

Other popular tracks marked emergent and consolidated fields in Triple Helix research with a focus on *Advancing new models and tools for knowledge transfer and Gender, entrepreneurship and diversity.*

Emerging Scientific Fields in the Triple Helix Model



©Todeva, 2016

A special thanks to all track conveners who moderated the selection process and the discussions during the conference:

TRACK	CONVENERS AND MODERATORS
Entrepreneurial University and its Socio-Economic Impact	Yuzhuo Cai , Tampere University, Finland; Karen Barrañon , Autonomous University of Barcelona, Spain
Entrepreneurial University and Regional Innovation Systems	Yao Wei , Research Institute of Development Strategy, Zhejiang University, China; Weng Mosi , Research Institute of Development Strategy, Zhejiang University, China
Science Parks and Incubators - New Frontiers	Juan A. Bertolin , Españtec, Science and Technology Park of Universitat Jaume I of Castellon, Spain; Guilherme Ary Plonski , University of Sao Paulo, Brazil
Measuring Social and Economic Impacts of Science and Technology Parks	Patricia Alencar Silva Mello , Ciro Biderman , Lycia Lima , and Claudia Hiromi Oshiro , Fundação Getulio Vargas - Public Administration and Government School (FGV-SP EAESP), Brazil
Regional Dimensions of Triple Helix - Clusters, Cities and Geographic Boundaries	Mike Danson , Heriot-Watt University, UK; Emanuela Todeva , Research Centre for Business Clusters, Networks and Economic Development (BCNED), UK
Innovation Clusters and Cluster Initiatives as Practical Implementation of Triple Helix Collaboration	Nataliya Smorodinskaya , Institute of Economics, RAS, Russian Federation; Tatiana Pospelova and Natalya Ivashenko , Moscow State Lomonosov University
Boosting Innovation and Growth Through University-Industry Co-Creation	Panayiotis Ketikidis , International Faculty of the University of Sheffield, CITY College; Devrim Göktepe-Hultén , Lund University, Sweden
Individuals in the Triple Helix	Rhiannon Pugh , Uppsala University, Sweden; Yuzhuo Cai , Tampere University, Finland
Business Led Triple Helix and the New Role of Government	Myung Chomyunghwan , College of Bioscience and Biotechnology, Konkuk University, South Korea; Marina van Geenhuizen , Delft University of Technology, the Netherlands; Michele Coletti , Politecnico di Milano
Are we facing a New Generation of National Innovation Systems?	Luiz Marcio Spinosa , University of California Berkeley (USA) and Pontifical Catholic University of Parana (Brazil); Christiane Gebhardt , Malik Institute St. Gallen, Switzerland
Advancing New Models and Tools for Knowledge Transfer	Hester Tack , Partner in Gunn and Twynmore, BV, The Netherlands; Professor Kenneth Husted , University of Auckland, New Zealand
Triple Helix Model and Knowledge Creation in Developing Countries	Mariza Almeida , Federal University of the State of Rio de Janeiro, Brazil
Triple Helix: Gender, Entrepreneurship and Diversity	Devrim Göktepe-Hultén , Lund University, Sweden; Rebecca Lund , DPU, Copenhagen, Denmark
Measuring the Strength of Triple Helix	Khalil A Arbi , University of Management and Technology, Lahore, Pakistan; Han Woo Park , Yeung Nam University, Korea
Triple Helix and Entrepreneurship Ecosystems in the Light of Complexity and Evolutionary Ecology	Bernd Wurth , University of Strathclyde, UK
Social Innovation – Is there a Role for Universities?	Doris Schartinger and Matthias Weber , Austrian Institute of Technology
Triple Helix and Governance	Claire Champenois , Audencia Business School

SPECIAL THANKS TO THE CONFERENCE HOST: THE GERMAN CANCER RESEARCH INSTITUTE (DKFZ)

The Conference host, the German Cancer Research Institute (DKFZ), provided an excellent environment for high quality presentations, and the speakers and moderators ensured sufficient time for rich and insightful conversations.



Professor Dr Josef Puchta
Administrative Director (DKFZ)



The Conference Gala Dinner was 'crowned' by the sound of the jazz band.



Adrian Solomon
University of Sheffield
International Faculty

CONFERENCE HIGHLIGHTS

Among the highlights of the conference were: the panel discussions on *Innovation in RHINE-NECKAR Metropolitan Region*, and the Plenary on the *German Innovation System*, which independently confirmed that the strength of German industry rests upon effective collaboration between firms and a multinational pool of scientists attracted by the strong research infrastructure in Germany. Active brokers in this dialogue, such as the InnovationLab Heidelberg, confirmed that 'if you host the most advanced technology equipment you will attract the best knowledge capacity'.

Dr Martin Raditsch highlighted how mobile are these transformational capabilities in the context of global production networks - an observation echoed also by the presentations at the roundtable on *Global Science 'Scapes'*.

The question of the plenary *Innovation in Germany - Doing Good but Can We Make It Better?* did not really produce an answer, due to the positive results generated by extra funding in research and strengthening innovation capacity. Germany is at the top in the world on technology transfer in some fields such as manufacturing 4.0, machine tools and



Professor Kratky Commission
for the Evaluation of the
Excellence Initiative

robotics. The German system, however, is dual: on one side is the frontier research at Max Planck and the effective knowledge transfer at Fraunhofers, but on the other side is the below average academic university system.

Although, the institutional funding in Germany does not produce a significant impact on the global ranking of German Universities, it clearly has enhanced the scientific capabilities of the leading research institutes, which feed effectively into the global competitiveness of the German economy. It seems that effective linkages across the government-industry-education and research spaces can support growth and prosperity without an explicit reference to the Triple Helix model.

The panel discussions on *Policy-Driven Analysis of the National Innovation Systems in Europe*, and the *Role of the European Commission JRC Research and Innovation Observatory (RIO)* revisited the same questions and raised further doubts whether scattered pockets of Excellence in Europe can drive regional economic growth without active Triple Helix constellations, participatory platforms and global linkages.

The conversation then continued to explore whether and how smart specialisation strategies can affect positively regions and economic growth, where we heard from *Smart Cities, Smart Regions and Smart Materials*, about the challenges to collaborate in a multi-stakeholder setting.

Presenters acknowledged that building Triple Helix, or Quadruple Helix by itself is a prerequisite, but not sufficient to address all challenges. Hence, some form of vertical and horizontal interface across national and regional Triple Helix constellations are required to address large scale problems.



Dr Martin Raditsch
InnovationLab
Heidelberg



**Dr Emanuela Todeva, Chair of the Scientific
Committee with Dr Wolfgang Sofka,**
Copenhagen Business School

The vision for science parks as hubs for investment and growth was reiterated in the case of Poland, where the Mayor of Bialystok, Mr Tadeusz Truskolasky, shared his insights for Bialystok Science and Technology Park in Implementing the Smart City Concept, and Todd Williams, CEO, Hunter Regional Development Australia, presented the regional smart specialisation strategy and discussed the Governance Framework (or lack of) for Triple Helix Interactions.



Tadeusz Truskolasky
Mayor of Bialystok

The regional dimensions of Triple Helix were discussed in a number of tracks, including two sessions on innovation clusters.

While comparing current cluster practices in different countries, including Germany, Russia, Brazil and Chile, discussions revealed that the nominal presence of Triple Helix actors is not a sufficient prerequisite for the emergence of true innovation dynamics, accompanied by synergy effects and productivity growth. Countries lacking a favourable institutional environment for a continual collaboration or failing to keep to the so called 'golden rules' for cluster policies (stemming from Michael Porter's concept of competitiveness) are facing systemic problems with transforming their clusters into self-financed and self-sustainable innovation ecosystems.



Katarzyna Szkuta, and Koen Jonkers, EC DG JRC,
with Professor Elena Tsipouri, University of Athens

The conference also included roundtables on *Varieties of Technology Transfer Models*; *Global Science Scapes*; and on *Gender, Entrepreneurship and Diversity*. Among the empirical evidence, Professor Helen Lawton Smith presented recent TRIGGER research from a survey and interviews on gender differences in the commercialisation of research in UK universities. The results included a series of recommendations on commercialisation benefits, career, gender, and seniority issues.

Plenaries and roundtables organised by the GEUM project on *Global Entrepreneurial University Metrics*, advanced the discussions and achievements of the principal direction for the partnership to collaborate with ranking systems and

promote the determined set of methods and metrics. The main observations confirmed that universities' innovative and entrepreneurial dimensions are excluded from the established ranking systems. Technical universities and universities of applied sciences realize a vast amount of innovation and entrepreneurship activities. However, there is no established form to demonstrate to the public and to stakeholders the results of such activities.

The members of the GEUM research network focused efforts on the emergent draft of a White Paper enlisting the current state-of-the-art in the field of measuring entrepreneurial university outputs and the outstanding questions and directions for future collaborative work. Countries present at the GEUM meeting were Russia, Brazil, USA, China, The Netherlands, The United Kingdom and Austria.

Other special events included two workshops on *Inbound Outbound Opportunities for Academia* and *Creativity as a Key Complement to drive Triple Helix Innovation*, an open session on *Triple Helix Funding Opportunities*, and the interactive Trilicious game 'What challenges can we solve together'.



Dr Emanuela Todeva, Chair of the Scientific Committee
with Todd Williams, CEO.
Hunter Regional Development Australia

CONGRATULATIONS

This year, for the first time, the Triple Helix Association sponsored two prizes (a) Best Scientific Paper and (b) Best Empirical and Practitioner Case.

The Awards Committee was constituted by Dr Emanuela Todeva, Chair of the Scientific Committee; Professor Panagiotis Ketikidis, Chief Editor of the International Journal of Innovation and Regional Development; and Dr Devrim Göktepe-Hulten, Editor of THA Hélice Magazine.

The Awards Committee gave two prizes, both worth 250 EURO. The winners were:

- Best Scientific Paper Award
Claire Champenois
HenryEtzkowitz
Boundary Spaces within Triple Helix
- Best Practitioner Case Award
John Hamilton Howard
Todd Williams
Renu Agarwal
Smart Specialisation as an Engagement and Governance Framework for Triple Helix Interactions.

Congratulations also to Juan Bertolin (Español, Science and Technology Park of Universitat Jaume I of Castellon, Spain), and Guilherme Ary Plonski (University of



Best Practitioner Case Award Winners
John Hamilton Howard, Howard Partners Pty Ltd (r)
Todd Williams, CEO Regional Development

Sao Paulo, Brazil) for their initiative to transform the track on [Science Parks and Incubators - New Frontiers](#) into a permanent research group as an official Thematic Research Group of the Triple Helix Association. We wish them well in their endeavour to bring together the research agendas of the International Science Park Association and the Triple Helix Association.

Overall, there was very little time to enjoy the historic grounds of Heidelberg Castle, and Heidelberg University Hall, or a boat trip along the river NECKAR - for those that committed to an extra day before or after the conference.



Professor Guilherme Ary Plonski
University of Sao Paulo, Brazil



Mr Mike MUTUNGI
I Choose Life - Africa
Host
First International Triple Helix Summit 2017

FUTURE MEETING FOR YOUR DIARY

At the end of the programme we were invited by three future hosts to continue the debates on the Triple Helix model during 2017-2018.

Mr Mike MUTUNGI, Founder and CEO of I Choose Life - Africa, invited everyone to put in their diaries the dates for the next event, the First International Triple Helix Summit, to be held on 4-6 April 2017, in Nairobi, Kenya. The Summit topic is *Accelerating the Attainment of Sustainable Development Goals through ICT and Data.*

PICTURE GALLERY

Special thanks to John Howard for his excellent photography! You can access the event photographs at:

www.flickr.com/photos/144019183@N07

CLOSING REMARKS

XIV International Triple Helix Conference
German Cancer Research Centre, Heidelberg

Dr Dimitri Corpakis
Former Head of Unit, European Commission
27 September 2016

Asked by the organisers to say a few words to recap what we have learned during this conference, I would not however dare to summarise what we heard since that would be a daunting task (there were indeed so many excellent contributions).

Let me instead simply refer to a number of key emerging issues that in my view will mark the pace of innovation from now on and in particular the evolution of regional innovation ecosystems:

- We first saw that innovation ecosystems struggle in a context of global crises: social, economic, geopolitical crises, affect the way innovation can progress, with direct impacts on its emergence, development and delivery modes;
- Despite this unfavourable context, we can still believe that innovation can help save the world: innovation ecosystems can indeed make a difference.
- Innovation has a lot of allies, but the emerging entrepreneurial university may be among its most efficient ones: we need to try to develop this further and introduce credible and efficient metrics; we saw very serious work developing on this issue and the Triple Helix Association can boast global leadership on this track;

- The new industrial revolution (industry 4.0), artificial intelligence (AI) and the Internet of things (IOT), as well as smart materials and overall global convergence between the physical and the digital worlds, have the power to change completely the way we live and operate on the planet. Innovation ecosystems will be strongly affected by these trends, but at the same time they will act as drivers in the whole process; connecting regional innovation ecosystems to global value chains that will determine their future success towards driving growth and jobs;
- We need to work systematically to properly reconfigure and fine tune the new generation of national/regional innovation ecosystems: for this we can use a lot of tools: clusters, science parks, technology transfer and above all clever strategies for smart specialisation. Smart Specialisation holds the promise to effectively become the acid test for any Triple Helix approach, as it involves trust building, priority setting, stakeholder management and consultation. Special governance frameworks should then be used for making these strategies a success.

The Triple Helix Association will need now to face new challenges, but also to grasp new opportunities. With your help and participation it will turn these challenges to a success.

I feel the need to finish this short intervention by thanking Henry for his leadership as well as the whole Triple Helix Association team and our hosts for this great conference.

Dimitri Corpakis

Triple Helix Association General Assembly

On 26 September 2016, after the Conference, the THA General Assembly was held with fifty-eight registered members in attendance.

The Assembly welcomed new members, the Executive Committee, Chapter Directors, and Thematic Research Groups Leaders reported their activities for the past twelve months. All motions were accepted by the General Assembly, and the Executive Committee took on board a number of recommendations, such as the need to strengthen and develop further industry and government helices, with a more extended portfolio of research, training and other services to members.

The General Assembly offered an opportunity for members to get acquainted with the development and achievements of the Association as well as an occasion to discuss with put forward suggestions for improvements in for the Association to serve better the community. The Assembly minutes are available on our website at the following link: www.triplehelixassociation.org/executive-committee.



PRESIDENT'S CORNER

Silicon Valley's Paradox of Success: A Katrina Effect¹

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INTRODUCTION

The Stanford Research Park is virtually invisible in Silicon Valley, although it occupies a large tract of land on the east side of the Stanford campus. The physical format of low-lying buildings surrounded by green space became a model for the development of science parks in other locations where it was often presumed that the architectural format, in itself, was the attractor and generator of high tech development. Nevertheless, the Stanford Park is not seen as a significant factor in the development of Silicon Valley even though it served as the model for the contemporary science park. Founded as an industrial park to attract manufacturing firms departing San Francisco and to raise money to support the development of Stanford, its founders soon realized that its potential resided in hosting firms emanating from Stanford that wished to stay close to their source for ease of continuing interaction. Today, the Park hosts the headquarters of the two descendant firms of Hewlett Packard, the Skype subsidiary of Microsoft, various law firms, the StartX accelerator, and other elements of the local innovation ecosystem.

A high tech conurbation with an expansionary dynamic respects no bounds of nature, counter-culture, exurban or urban life. Starting from Santa Clara County on the Peninsula, Silicon Valley is expanding in all directions. Crossing the Santa Cruz Mountains to reach the Pacific coast, it is expanding into the city of San Jose as firms, like Google and Apple, outgrow the willingness of smaller cities such as Mountain View and Cupertino to accommodate their growth. Moving into and above Berkeley, it is spreading across counties formerly considered as part of the Bay Area, itself an expanding geographical classification. Even Oakland's downtown, where murals hid some empty storefronts, is experiencing signs of gentrification. Moving ever further east and south, Silicon Valley is expected to cross the mountains into the Central Valley where the

University of California, Merced, a new campus, provides an anchor for future high tech agglomeration in an agricultural region, much like the Valley itself sixty years ago. Indeed, San Joaquin County has pro-actively defined itself as "Greater Silicon Valley" as part of a concerted effort to promote the nascent trend.

Success has too often been fleeting, as with Finland's Nokia or insufficient, to date, in Vancouver. Silicon Valley's current employment growth is driven both by location of branches of firms from Asian and Europe seeking to tap into the region's technology as well as expansion of indigenous firms, both iconic and start-ups in long standing and emerging technology fields. Ironically, quality of life is driven down for all but a super-elite as the result of an imbalance that emerges between private and public spheres. The traditional idea of management is to transform bad problems into good problems. 'Wicked problems' have been defined as complex issues, the entanglement of multiple causation whose solution creates new innovation potential from the collaborative effort to meet their challenge.² This essay discusses the sources of Silicon Valley's success and issues that have arisen due to "too much success."

SILICON VALLEY'S "SECRET SAUCE"

Silicon Valley's extraordinary success came as a result of following the classic US "Endless Frontier" innovation model of concentrating resources and "picking winners" behind a laissez-faire façade. The original source of the Valley is a university with porous boundaries. The founding leadership, including Stanford University's President, David Starr Jordan, encouraged graduates to form technology firms in the late nineteenth century to electrify the region, utilizing existing technology. The next generation of Stanford faculty members, exemplified by Frederick Terman,

¹ Presented at the session on "Science Scapes", Triple Helix Conference, Heidelberg, Germany, 2016.

² Oksanen, K and Hautamäki, A. (2015) Sustainable Innovation: a Competitive Advantage for Innovation Ecosystems. *Technology Innovation Management Review*, 5 (10), 24-30.

together with their students, interacted closely with a next generation of firms, pursuing incremental innovation. In this era, the firms were often more technologically advanced than the university and aided its development.

The dynamic was set in motion, drawing technological demand into the university and sending research results out through cooperative relations with firms. Faculty were allowed and encouraged to have serious dual roles in firms. Technical industry existed in symbiosis with the university, indicated by a significant percentage of faculty recruited for impact and encouraged to continue extra-academic pursuits, to this date. A similar university-industry interaction dynamic occurred at MIT even earlier. This interactive dynamic is the source of new high tech conurbations and can be found in contemporary Pittsburgh in Carnegie Mellon University's attracting significant federal R&D funds, serving as the progenitor of that city's emerging robotics and AI industries.

The key intervening factor Triple Helix development in Silicon Valley was large scale government funding of academic research, allowing a small-scale nascent process, exemplified by the founding of Hewlett Packard from a Stanford research project that had produced an innovative technology just prior to the World War II, to become an efficient breeder of start-ups in the post-war. Stanford drew government more tightly into its orbit during the early post-war by establishing Stanford Research Institute (SRI) dedicated to attracting funds, including projects beyond the interest and capacity of individual professors. Spun off from the university in the wake of the anti-Vietnam War protests, the Institute played a key role in transforming Stanford into a federally funded research university. Silicon Valley's growth dynamic, based upon silicon chips, was set in motion by government transistor procurement policy. Seeking to miniaturize battlefield communications equipment, the US Army drove a learning curve in transistor development that led to the development of the integrated circuit.

The chain-link innovation model, linking demand-side firm innovation to supply side academic invention, captured only part of this dynamic. The cluster of firms that emanated from this Triple Helix interaction acquired the label of Silicon Valley in 1971. In succeeding decades, the dynamic was replicated in other technology domains, supported by an increasingly complex set of supporting actors, including venture capital firms, technology transfer offices, and other boundary spanners. However, the most fundamental dynamic in the Valley emanated from the interaction between university and industry, among firms and between government and these more visible actors. Behind the two PhD students who met at Stanford's computer science department and became Google's founders was a Defense Advanced Research Project (DARPA) program that funded the research group that they were a part and posed the search problem that they solved.

It is a classic fallacy of "misplaced concreteness" that a Science Park with a set of buildings or a formal enclosed institutional format such as a Technopole can substitute for such an interactive dynamic. Unfortunately, this is the message that is most often taken away

from Silicon Valley by visitors looking for a "quick fix" to achieve a knowledge-based conurbation without serious institutional restructuring, new institution formation, as well as long-term perspective and commitment. Such efforts are often slowed by an innovation system approach that views organizations as having specialized functions, necessitating boundary spanning organizations or intermediaries to navigate between the institutional spheres, with special purpose logics.

A Triple Helix with integrative boundary spaces³ and institutional spheres that "take the role of the other" models a spiraling innovation process in which gaps may be filled by substitution of one actor by another. It is this latter capability that makes the Triple Helix especially relevant to developing and declining industrial regions, alike. Indeed, the two prototypical US Triple Helix regions 'Silicon Valley' and Boston, in their early twentieth century conditions, arose from collaboration and policy support.

Innovation-impeding boundaries are counterproductive to innovation as is overreliance on an accelerator model, exemplified by Silicon Valley's Y-Combinator and Start-X that is more relevant for start-up growth once a Triple Helix dynamic is in place as its substrate. The key element of such accelerators is a training process through selection, insertion into a network of fellow start-ups, mentoring by experienced entrepreneurs, and access to seed investment opportunities. The accelerator format rests upon an already developed high tech environment replete with a deep bench of angel investors, venture capital firms, potential start-up collaborators that makes it possible for the accelerator supported firms to takeoff and flourish. That innovation ecosystem is itself is a second order phenomenon, resting on a first order dynamic of Triple Helix interactions among institutions with porous boundaries.

When the 'cart is placed before the horse', as when the Brazilian military regime constructed science parks in isolated suburban regions during the 1960's, little innovation activity occurred until a smaller scale model of incubators and entrepreneurial education within universities was adopted. At best, branches of existing firms and government laboratories may be attracted to a stand-alone Science Park. Some decades later when they close or downsize, their former employees who wish to stay in the area, may generate a start-up dynamic as in Sophia Antipolis and Research Triangle. A more direct route is focus on facilitating university-industry interactions, especially creating an academic environment that recognizes it as a valued activity. The entrepreneurial university, holding a commitment to its region's development, with a significant number of faculty members who encourage their graduates to spin-off technology from their well-funded labs, and may hold dual roles in high tech firms themselves, are the core of a triple helix dynamic.

"TOO MUCH SUCCESS"

San Francisco, a traditional financial, manufacturing, and port city, as well as tourist destination, cultural and counter-cultural mecca is being swallowed by Silicon Valley. Historically a working class city

³ See Etzkowitz, H and Champenois, C. 2017 *From boundary line to boundary space: the creation of hybrid organizations as a Triple Helix micro-foundation. Technovation, forthcoming*

with small upper class, San Francisco is being transformed into an upper-middle class city. It's working and middle classes are increasingly squeezed out due to escalating housing costs that are an unintended but entirely foreseeable consequence of rapid employment growth in high tech industries during the past decade. In 2011, firms like Twitter following the usual business tactic of threatening to leave the city, or not locate projected facilities, if their demands were not met, obtained tax breaks for a number of years. These were granted by the city administration on the condition that they locate their offices in a downscale area, the "Tenderloin," which the city wished to upgrade.

The influx is generated not only by firms locating in the city but also by employees of high tech firms on the suburban peninsula who prefer an urban life style. Their employers, utilizing luxury bus coaches, to take them to and from work, have put on an ad-hoc inter-urban transportation system. Its highly visible presence, in contrast to the relative privacy in which residential succession takes place, has provided a focal point for anti-gentrification protests at the municipal bus stops that the private transportation system uses as its own. The busses are the most visible component of the "total institution" that these firms attempt to create in their office compounds, offering munificent snacks; gourmet free lunches and perks such as dry cleaning services to ease the burdens of everyday life, encouraging employees to focus on their work.

In just five years, Twitter and its peers attracted large numbers of employees who wanted to live in San Francisco. Rents have escalated as San Francisco has become unaffordable to many of its previous inhabitants who are constrained to move out. Even with rent controls in place, landlords may evict existing tenants and upgrade their premises to attract new tenants at double and triple rents. Provisions to have new upscale developments include a modicum of affordable units in exchange for increased density provides only a token solution. Older residents who can afford to remain oppose new high-rise structures, with and without affordable housing elements, further exacerbating the housing crisis. Rents have recently dipped slightly, providing a breathing space to consider how to address the longer-term trend.

THE KATRINA EFFECT

The dislocation of people in New Orleans caused by the Katrina hurricane is happening in San Francisco from the influx of firms like LinkedIn and Twitter. The unintended consequences of success is damaging the urban social fabric and causing attendant personal distress. What is happening in San Francisco as a persisting chronic condition is similar to what happened in a discrete acute way in New Orleans as a result of a natural disaster. People had to leave suddenly and move elsewhere. In succeeding years, some have moved back. Not surprisingly, people with greater resources have been more able to return to their native city. However, many with fewest resources who could ill afford to return have not come back. Also, not surprisingly, economic divides largely coincide with racial differences. In a sample of "... largely female African American poor people ...," some leavers improved their housing

and employment condition in the relocation process that was set in motion by the disaster but at the cost of loss of their connection to the culture of New Orleans.⁴ As a result, the city of New Orleans moved up a bit on the gentrification scale as its population shrank selectively.

The persisting negative consequence of social change, even if positive in some respects, is "the Katrina Effect." Thus, impoverished former residents of New Orleans, forced out by Katrina, improved their employment prospects and housing conditions. However, they suffered weakening or loss of social ties to family and friends by the physical distance imposed by relocation. Moreover, removal from the ambiance of their former familiar surroundings and even the loss of access to familiar food items within their cultural context caused further deprivation. The experience of material and psychic resources moving in opposite directions may also have a disconcerting, disorienting effect on those who experience it.

Whereas relative deprivation is the surplus of disesteem generated by comparison to peers who are otherwise equal;⁵ absolute deprivation arises from comparison with those who clearly advantaged on multiple dimensions. Absolute deprivation also generates its own surplus of psychological disesteem. However, the social distance between the lower and higher realms may induce identification with the higher distant object as a substitute for attainment, or if social distance is so reduced as to allow contact, a breaking off of the relationship may ensue for fear of being dragged down, "a Rosalind effect," after the female character in F Scott Fitzgerald's *This Side of Paradise*, who breaks off her relationship with well born, but increasingly impecunious, Amory Blaine.

An ever-present threat to the poor, eviction confronts middle class San Franciscans with a new reality of downward mobility and exile. Exclusion is also experienced in its weaker form as lack of access to preferred housing location and type. A member of Palo Alto's Housing Commission, who recently resigned, illustrates the phenomenon. Both she and her husband, a software engineer, were relatively high paid but, nevertheless, could not afford to buy a house in Palo Alto. She announced in an interview that they were moving to Santa Cruz where they could find a house within their means. Ironically, the succession dynamic is replicated in Santa Cruz where it is reported that residents are moving out as housing costs grow beyond their means. The paradox of success creates a dynamic in which quality of life goes down except for the most highly successful who then drive up housing costs as they choose to live near where they work.

A social ecological succession may be identified, similar to the natural one in which grasslands turnover into woods and back to grasslands again over a half-century or so. Artists, bohemians, and counter cultural denizens in general, priced out of San Francisco by rising rents have been reported to be moving from San Francisco, reappearing in East Los Angeles, where they are seeding minority and working class neighborhoods with a hip sensibility and

⁴ Waters, M. 2015 *Disaster and Recovery: a Longitudinal Study of Hurricane Katrina Survivors*. Stanford Sociology Colloquium, 19 February. www.sociology.stanford.edu/events/sociology-department-colloquium-mary-c-waters, last accessed 5 October 2016.

⁵ Merton, R. K. *Social Theory and Social Structure*. New York: Free Press, 1968

attendant coffeehouse and restaurant businesses. It may be expected that more conventional young professionals will follow, attracted by the accouterments of a diverse urban neighborhood. Perhaps ironically, these were the very characteristics of the San Francisco scene that these artists had left, exemplifying another paradox of success.

There are inadequate means in place to deal with these issues. Joint Venture Silicon Valley (JVS), is a public-private partnership that tracks trends on behalf of local governments and sponsors regular conferences to discuss issues. Business led, it has convening but not governing power. There is no regional government in this region, with the exception of special purpose districts to deal with discreet phenomenon such as repairing the ecology of the San Francisco Bay, or to provide community colleges through the Foothills District. Silicon Valley is a term popularized by a journalist in 1971, originally denoting the unique technological industry of the era, the micro-chip array of transistors, on which a succession of devices and industries have been built. The Silicon Valley label attracted international currency and took on a broader meaning representing the succession and intersection of technologies, the agglomeration of high tech, venture capital, universities, innovation and entrepreneurial resources.

Silicon Valley's quintessential characteristic has been the informal technical community of crisscrossing firms, whose members exchanged information in local bars, after working hours in contrast to Boston's isolated large firms.⁶ Some Silicon Valley firms have recently set strict rules against discussing technical information with outsiders, compartmentalizing employees within the firm. Apple uses color coded badges to maintain separation while Google has recently been faulted for falling behind in a key emerging technology, despite having greater expertise than its competitors. This expertise however, was bottled up in discrete groups, working on separate smaller projects and products, rather than being brought together to achieve a larger goal an artificial intelligent personal assistant.⁷ Nevertheless, communication within Google, even across national boundaries is extensive.⁸ The balance between secrecy and openness even in an era of 'open innovation' is still fraught.

The firm formation and growth engine that creates huge economic resources has attracted an influx of people globally, much as the gold rush of 1849, but the latter migration with its attendant industry of immigration lawyers is a longer-term phenomenon that shows no signs of abating. Whether keeping or discarding previous citizenship, they identify themselves as part of Silicon Valley. The migration includes firms as well as individuals and has generated a support structure to ease the entry and transition process. Many countries find it advantageous to establish "organizational beachheads", either their own incubators or space in existing

facilities, to bring their start-ups to learn the methodology of high-tech growth.

In the opposite direction, leading Silicon Valley firms and universities search the world for talent and are usually successful in attracting it. A Stanford professor recently recounted how despite his position at a leading New York university (and an apartment in Greenwich Village) he accepted an offer to relocate. Silicon Valley is also a leading destination for successful start-ups from elsewhere in the world. Thus, "Not surprisingly the top fifteen acquirers in the transatlantic ranking are all US companies. Even less surprisingly, eleven out of the top fifteen are from the Silicon Valley."⁹ Open Austria, a three person Shop, sponsored by the Foreign Ministry and the Chamber of Commerce has opened an office in Galvanize, a private incubator in downtown San Francisco. Its mission is to assist start-ups from Austria visiting the Valley, seeking partners and resources and to keep on eye trends in the start-up and Silicon Valley technology and venture capital scenes. The Austrian Foreign Minister spoke at the opening breakfast event, attended by hundreds of Austria expatriates and friends, some of whom hold high positions in Google and other firms.

WHAT IS TO BE DONE?

Too much success is a broader phenomenon than Silicon Valley, with artistic impetuses as well, for example, in New York's Soho. The arrival of artists in a deindustrializing district, transforming factory buildings into lofts, followed by bars, galleries, restaurants; then attracts lawyers, stockbrokers and other professionals who appreciate the bohemian ambiance generated. Loft prices are driven up and the artistic community gradually departs as ever more upscale living places and businesses take root. The human ecological succession process has been made into a regional renewal tool: inviting artists to locate in order to jump-start the urban transition process. However, the transformative power of technology is arguably stronger than the artistic dynamic. Although, Walter Benjamin noted that art in the age of mechanical reproduction is duplicable; the hard copy distribution of Life Magazine images is modest in comparison to that of the Internet.

Silicon Valley is a global icon, a solution to the wicked problem of deindustrialization and underdevelopment, as well as a highly desired 'good problem'! Nevertheless, a 'corporate induced disaster'¹⁰ is in the making if we consider the unwilling displacement of people as a deleterious consequence of innovation success. In Cambridge's Silicon Fen, green belt restrictions have pushed back against expansionist pressures, encouraging firms to relocate from the university town, on the one hand, while new high rise office blocks adjacent to the railway station provide some room for local growth. However, if office blocks are not complemented with housing, Cambridge will experience the same phenomenon as San Francisco, if it is not already.

⁶ Saxenian, A. *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*. Cambridge: Harvard University Press, 1994

⁷ O'Brien, C. *Welcome to the new and expanded Silicon Valley*. Mercury News, August 13, 2016.

⁸ Comment, Sverker Allange

⁹ Orizio, S. 2016. *Three out of four startups are acquired by US companies*. September 12, Mindthebridge.com. Accessed 4 October 2016

¹⁰ Etzkowitz, H. *Corporate Induced Disaster: Three Mile Island and the Delegitimization of Nuclear Power*. *Humanity and Society*, 8.3, 1, Aug 1 1984. <http://search.proquest.com/openview/bbac9ee33ebbb092490f17f05f015d19e11?pq-origsite=gscholar>

A combination of public and private remedies may be suggested. On the one hand, revision of Proposition 13, the 1978 ballot initiative that reduced property taxes on individual houses and business property, is called for. Over time government lost more revenue and businesses gained much more than individual homeowners as business properties turn over much more slowly than houses and are thus less often subject to revaluation and potential rate rises. Companies should take responsibility for housing provision in conjunction with employment growth. Firms above a certain size might be required to provide a housing unit for each job created. In future development plans; corporate campuses with housing as well as offices would be the mode. For example, Stockholm Kista Science Park, where housing has been constructed could be the model for Stanford's science park. .

Silicon Valley is the outcome of a nested "egg within an egg" model of porous university boundaries that encouraged a start-up and spin-off dynamic and munificent government research funding that became the basis for "ecosystem" of intellectual property law firms, angel investors, venture capital firms; accelerators, incubators etc. A relatively few decades ago, fruit orchards and a university were the highlights of the area that later became known as Silicon Valley. This quintessential high-tech conurbation, its label originating with Silicon chips, extends across an array of physical, software, and biologically based technologies, intersecting and hybridizing to create new industries and transform existing ones.

In Triple Helix and innovation studies, we usually inquire how to create a science and knowledge based conurbation and focus our analysis on how to reach that objective. A variety of

methodologies from Porter's diamond, cluster policy, science parks, and the European Union's smart specialization strategy have been invented to assist localities, regions, and nations in their quest to duplicate this success. The impetuses of declining industries and movement of high-paid jobs to low waged areas have lent urgency to this task. How can other regions replicate Silicon Valley is a continuing challenge; how can Silicon Valley restructure itself to respond to the Katrina effect is a new challenge.

The broader implications of the Katrina effect are exemplified by the Brexit vote in the UK and the Trump victory in the US: populations excluded from economic success in democratic countries will make themselves felt at the ballot box, even if the specific vote is not directly aligned with their dissatisfaction. An economy focused on an elite, whether financial services or a high tech conurbation based upon the design but not the manufacture of devices is too narrow to provide sufficient economic opportunities for the majority of the population. An imbalance between public and private, with a preponderance of economic benefits flowing to a small elite rather than being spent on public goods, like infrastructure, education, R&D and health care, creating a broad range of economic opportunities and jobs, must be redressed. The sources of Triple Helix innovation and entrepreneurship reside in both the public and private spheres. To over-emphasize the private at the expense of the public may produce a temporary advantage for a few but it will be at the expense of long-term sustainability.

XIV International Triple Helix Conference

The Best Practitioner Case Award Paper

Smart Specialisation as an Engagement Framework for Triple Helix Interactions

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ABSTRACT

The Triple Helix (TH) framework is a well-established theoretical concept and a basis for portraying patterns of industry-science-government interactions. The TH framework provides a useful depiction and description of what might take place in what are commonly described as 'regional innovation ecosystems'. There is a presumption that interactions will evolve around the convergence of missions concerning creation and utilisation of knowledge, regional networks, government regulation and venture finance, and decisions of multinational corporations and international organisations.

However, like the regional innovation systems model itself, the TH model offers little in the way of practical guidance about how interactions can be nurtured and developed, what and where new public and private innovation investments should be made, the most appropriate way to go about building and strengthening engagement between institutions to achieve innovation outcomes, and most significantly, the governance and intermediary arrangements appropriate to guide planning, budgeting and resource allocation at a regional level. This paper addresses the extent to which the Smart Specialisation framework can address those investment, engagement and governance issues.

OVERVIEW

The EU has promoted *Regional Innovation Smart Specialisation* (RIS3) as a concept and agenda for science, technology, and innovation (STI) policy in regional economies. It has been developed across the EU and is a condition for 2020 Cohesion Funding (Foray, Goddard, Beldarrain, Landabaso, McCann, Morgan, Nauwelaers, and Ortega-Argiles, 2012; McCann and Ortega-Argiles, 2014).

RIS3 is promoted as providing an integrated, place based, and transformation policy framework (OECD, 2013) that aims to:

1. Concentrate public resources on innovation and development priorities, challenges and needs
2. Outline measures to stimulate private research, technology and innovation investment

1. Build on a region's capabilities, competencies, comparative advantages and potential for excellence in a global perspective
2. Foster stakeholder engagement and encourage governance innovation and experimentation
3. Be evidence-based and include sound monitoring and evaluation systems.

The way in which RIS3 can address the implementation aspects of TH frameworks, and particularly build engagement and provide for effective governance, have the potential to make a major contribution to operationalising the TH concept.

In this paper the way in which Regional Development Australia (Hunter), one of fifty-five Regional Development Australia (RDA) Committee¹, has addressed TH implementation in a framework of smart specialisation.

THE TRIPLE HELIX CONTEXT IN THE HUNTER REGION OF AUSTRALIA

The Hunter region in the State of New South Wales covers an area of 29,000 sq.km and has a population of 640,000. The regional centre, Newcastle, is 160 kms from Sydney, with a travel time of two hours by road, and three and a half hours by train. A high speed rail service has been on the political agenda for many years. There is a regional airport that links Sydney, Melbourne, Brisbane, and regional centres.

The Hunter has a traditional industrial base, constituted primarily by mining (22.3% of the Gross Regional Product of \$A38.46 billion), manufacturing (11.7%), health care and social assistance (7.7%), finance and insurance services (6.5%) and construction (6.0%). It is one of Australia's largest regional economies. It is also well known for the production and processing of fine wines which are exported globally.

With the end of steel making in the Hunter, and an uncertain future for coal mining, a need has been recognised to transition to an economy where high-tech industries grow and knowledge based

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¹ <https://rda.gov.au/about/what-we-do.aspx>

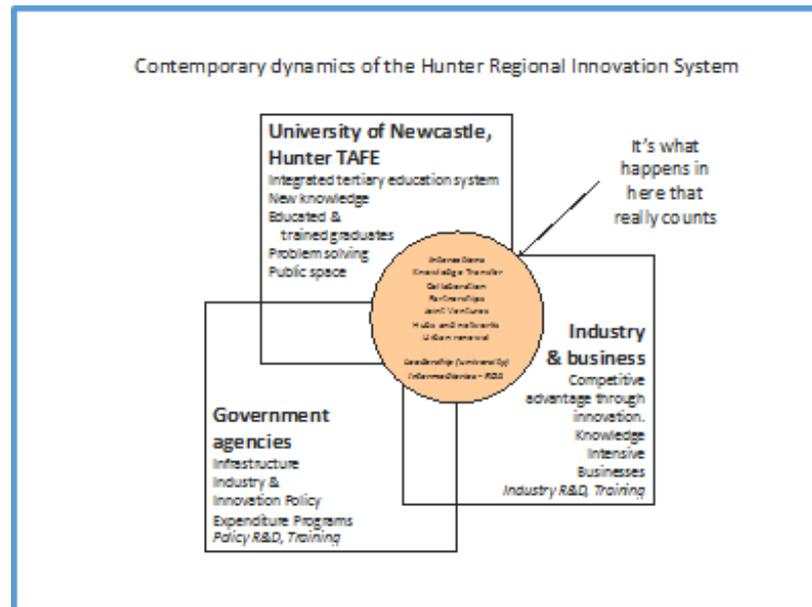


Figure 1 Triple Helix Interactions in the Hunter Region

services industries become the predominant drivers of the economy. This has involved, and will continue to involve strengthening relationships between research organisations, industry and government.

A Triple Helix (TH) framework for the Hunter Region is represented in Figure 1.

In a TH context, the framework typically identifies three broad institutional categories: research and education; industry and business; and government agencies. The role of the research and education sector is identified in terms of the broad roles of the University of Newcastle, that extends well beyond research and teaching into an engagement role of providing 'public space' for regional development and community discourse (Gibbons, 2003; Lester, 2003) and the Hunter Institute of Technical and Further Education which has a very close engagement with industry.

The University of Newcastle is one of Australia's leading research universities, has a very strong STEM and Medical research profile, and in 2012 it was recognised by *Research Excellence Australia* (ERA) as having internationally recognised strengths (category 5) in a number of industry relevant research fields including statistics, condensed matter physics, macromolecular, materials, physical geography and geoscience, biochemistry, civil, electrical, electronic and resources engineering, extractive metallurgy, and cardiovascular medicine and haematology.

The role of business is identified in terms of its market orientation covering competition and commitment to innovation. There are several business associations and networking organisations in the Hunter pursuing economic development and innovation opportunities for their members. For example, the Hunter Region Office of the Australian Industry Group hosts a *Manufacturing Cluster*, Hunter Business Chamber hosts a *Founders Forum*, and the Hunter *Business Centre* is a not-for-profit Business Enterprise hub supporting micro, small, and medium businesses. *HunterNet* is an

engineering and manufacturing peak body of over 200 members with a focus on collaboration, innovation, and training services.

A *Hunter Defence* network works alongside industry and government to build defence related capacity in the Hunter region. Global prime contractors, including BAE Systems, Thales, Boeing, Lockheed Martin, Northrop Grumman, Raytheon, Forgas, and Varley are located in the Hunter. There are also many defence capable SMEs, technically capable people and supporting organisations. These businesses create strong demand for STEM qualified employees. Hunter RDA manages a programme to lift STEM participation in schools.

There are three tiers of government and numerous separately constituted government agencies present in the region including Departments of Industry, Agriculture, Planning, and Environment, and ten Local Government Authorities. There are currently over 130 Commonwealth and State programme support and assistance measures available to stimulate private research, technology, entrepreneurial, and innovation investment in the region, although their impact and effectiveness is difficult to ascertain.

The TH framework represented in Figure 1 foreshadows an important role for intermediaries to develop and articulate a strategic approach to TH interactions and relationships that will contribute to the achievement of innovation and regional economic development goals and outcomes. These goals are generally expressed in terms of growth, employment, incomes, as well as goals of social inclusion. The nature and extent of the interactions between institutional spheres in driving innovation and economic outcomes is a fundamental consideration concerning the performance of regional innovation systems.

The Hunter is a microcosm of complexity in TH relationships, reflected in the multitude of roles, responsibilities and accountabilities that exist between and within the institutional dimensions. It is reflected spectacularly in the multitude of planning

and resource allocation documents prepared by government and semi government agencies in the region, few of which bear any relationship to the other.

GOVERNMENT ROLE IN REGIONAL ECONOMIC DEVELOPMENT

Australia does not have a system of regional governance. Responsibility for economic development is principally a matter for State/Territory Governments, whilst the Commonwealth Government has a major role in science, technology and innovation (STI) policy. The Commonwealth has struggled with regional economic development policy with emphasis waxing and waning depending on whether it is a Labor or Conservative Government in office.

In the absence of regional governance, responsibility and accountability for regional economic development in the Hunter, like other parts of Australia, is highly distributed, with multiple Commonwealth and State government agencies and authorities having plans, strategies, and commitments that impact on regional resource allocation, growth and employment. These include, for example:

- The *Economic Profile*, prepared for the Economic Development Strategy for Regional NSW (NSW Trade and Investment, 2015).
- The *Draft Hunter Regional Plan*, prepared by the Department of Planning and Environment, that provides the land use framework for economic development, (NSW Planning and Environment, 2015a) and the *Draft Plan for Growing Hunter City* (NSW Planning and Environment, 2015b)
- The *Hunter Economic Infrastructure Plan*, prepared by Infrastructure-NSW and RDA Hunter to remove mining-input pinch points, streamline the export supply chain and address issues in mining-impacted communities. (I-NSW, RDA HUNTER, 2013)
- The *Hunter Strategic Infrastructure Plan*, prepared by the Hunter Development Corporation, that aims to provide the strategic infrastructure framework to inform future urban growth of the Hunter Metropolitan Area (Hunter Development Corporation, 2013)
- *Hunter Regional Growth Plan 2016-2019: Economic Development Strategy for the Hunter*, the latest whole-of-region plan produced by RDA Hunter (RDA HUNTER, 2016)
- The *Local Land Services Strategic Plan, 2016-21*, prepared by NSW Land Services, that focuses on assisting primary producers to improve practices for social, economic and environmental outcomes (NSW Local Land Services, 2016)
- The *Hunter Regional Transport Plan*, prepared by Transport NSW, which covers road, rail and public transport investments (Transport for NSW, 2014)
- The *Hunter New England Local Health District Strategic Plan* (NSW Health, 2014).
- The *Port of Newcastle*, a privately owned corporation, aims to 'promote and support the prosperity of the Hunter Region

and New South Wales in a sustainable manner'. The Port is currently developing a 90-hectare site for port related activities for a range of cargo handling infrastructure and for the promotion of trade.

- *Newcastle Airport*, a corporation owned by two of the LGAs, has developed a Master Plan that includes commitments to 'economic prosperity and job creation' and 'ecologically sustainable development'.
- The Department of Primary Industries publishes an *Upper Hunter Agricultural profile* that identifies important agricultural resources, critical features of region's leading agricultural industries, their potential development and related land use planning issues (NSW Department of Primary Industries, 2013).

Most of the ten Local Government Authorities (LGAs) in the Hunter region have prepared their own economic development strategies (Cessnock City Council, 2014; Lake Macquarie Council, 2013; Newcastle City Council, 2016; Port Stephens Council, 2007; Singleton Council and Strategic Economic Solutions, 2015).

There is a formal grouping of the ten LGAs into an association of regional councils, *Hunter Councils*, which collaborates in the areas of biodiversity conservation, climate change, environmental compliance (under the Hunter and Central Coast Regional Environmental Management Strategy), staff training, procurement, records storage, consultancy and legal services.

Whilst this planning infrastructure has a strong focus on economic development, it tends to ignore, or by-pass, commitment to research and innovation. In terms of the TH framework, it focusses on business and government, representing a two dimensional framework of interactions.

EXTENDING THE ROLE OF INNOVATION IN REGIONAL PLANNING FRAMEWORKS

Due to the institutional setting, regional economic development has tended to take an investment and infrastructure approach to regional planning. It has a strong focus on industry development and job creation. This is also inherent in the Commonwealth Government's mandate for Regional Development Australia (RDA) Committees.

The system of RDA Committees was established by the Commonwealth and State Governments in 1998 to act as 'the regional development voice of their communities'. Committees are expected to:

- consult and engage with communities
- promote and participate in regional programs and initiatives
- provide information and advice on their region to all levels of government
- support informed regional planning.²
-

RDAs also work with stakeholders to support the development of proposals for government and private sector funding for regional purposes.

² <https://rda.gov.au/about/>. More recent formulations of purpose emphasise the role of RDAs in RDAs promoting awareness of, and access to, Australian Government programmes - see <https://rda.gov.au/review/terms-of-reference.aspx>.

RDA Committee members are appointed by Government on the basis of a formal application and assessment process. Members can include people with knowledge, skills, and experience in local government, tertiary education, business, professional services, and NGOs. Committees are not, therefore, representative organisations. However, their charters reflect, in some measure, the network governance model envisaged in the RIS3 Guide (Foray et al, 2012).

Each RDA Committee is expected to develop a *Regional Plan* which outlines priorities for the region and guides them in strengthening their communities. The level of commitment to planning in each RDA varies across regions, as does the commitment to innovation and broad economic outcomes. But with multiple stakeholders, the networked governance framework creates a major challenge for efficient and effective planning and resource allocation decision making.

RDAs have a responsibility for setting priorities, screening, and supporting applications from their communities under the *Regional Development Australia Fund*, set up in 2011 to “support the infrastructure needs and economic growth of Australia’s regions”.³ Under the most recent funding round, forty-two grants of between \$500,000 and \$15 million were approved for projects covering the construction of new and/or upgrading of existing sporting, cultural, arts and community facilities as well as airports and roads. Support for university infrastructure projects is not within scope of the Fund.

It is clear that within the framework of multiple organisation and funding responsibilities, economic development in Australia has a very strong regional focus, particularly in delivery of infrastructure and local job creation. By contrast, knowledge based innovation, by its very nature, tends to have an international orientation, involving the adoption, application, and utilisation of knowledge in global contexts. This is inherent in the RIS3 approach embedded in the European 2020 Cohesion strategy.

RIS3 represents a significant departure from traditional approaches to regional economic development planning. It offers a strategic approach to *regional innovation system* planning, and in doing so, it has the additional advantage of taking a *place based* approach to innovation.

The Hunter RDA committee identified the potential in the EU RIS3 approach and has taken the RDA mandate a step further with commitment to innovation as a key element in regional economic development planning. In 2015 the Hunter RDA Committee committed to the development of a Smart Specialisation Strategy for the Region. The aim of the Strategy was to be a catalyst for new activities to strengthen the economic development of the region by:

- Informing policy to ensure effective and efficient spending of research and innovation funds.
- Identifying regional priorities based on current strengths and comparative advantages that support high value-add activities

- and offer the best chances for strengthening competitiveness.
- Recommending potential areas for future comparative advantages, entrepreneurship and growth.
- Encouraging partnerships (locally and beyond the Hunter) in governance, project delivery, monitoring and evaluation.
- Supporting productive research and innovation activities for smart, sustainable and inclusive growth of the region.

The Strategy was launched in March 2016 by the Prime Minister of Australia at an event in Parliament House, Canberra (RDA Hunter, 2016). It was prepared on the basis of RDA Hunter’s strong knowledge base of innovation and entrepreneurial capability in the region (RDA Hunter, 2014, 2015a, 2015b, 2015c), prior research (Deloitte Access Economics, 2013), extensive consultation with businesses and research organisations, and access to the RDA’s well-developed networks across business and government. staff from the University of Technology Sydney assisted in framing the strategy.

The key recommendations of the Hunter RIS3 are listed in Figure 2.

Smart Specialisation is now an integral part of RDA Hunter’s ongoing work to grow the Hunter’s international competitiveness through innovation. It has provided a solid basis for the development and implementation of an innovation strategy for the region. However, while the Strategy has been received favourably within the region, nationally and internationally, Hunter RDA does not have a mandate for implementation and delivery of the Strategy. This calls for complementary roles and governance arrangements in strategy development and implementation.

COMPLEMENTARY ROLES FOR SMART SPECIALISATION IN THE HUNTER REGION

The RIS3 approach is of course one, albeit important, dimension of innovation system strategic planning. It presents what is essentially a structural and functional perspective to strategic positioning, focussed on an articulation of the opportunities, and potential risks, associated with a region’s multifaceted engagement with the global innovation system (the network of transnational value chains that drive trade patterns and shape the global dispersion of innovative activities: who does what, in competition or collaboration with whom - and how well).

It is prudent to balance this structural and functional emphasis with a *dynamic efficiency* dimension - the ways in which an innovation system provides risk-taking entrepreneurs with the necessary capability to learn and adapt in the face of inevitable uncertainties and unexpected events. As very different types of planning architecture and objectives are involved in each area of emphasis, it is vital that to address this distinction and its implications for the strategic planning process. The approach to the development of RIS3 by Hunter RDA has the potential to capture this dynamic efficiency dimension through interactions and relationships with other actors in the innovation system.

³ <http://regional.gov.au/regional/programs/rdaf.aspx>.

In parallel with the development of the Hunter RIS3, the University of Newcastle had prepared the *NeW Futures Strategic Plan 2016-2025*, Figure 3, which aims to deliver economic impact through commercialisation of new knowledge and job creation as a result of contributions to business improvement, entrepreneurship, the creation of start-ups and new businesses, and the supply of industry ready graduates (University of Newcastle, 2016b). The Hunter TAFE also has a *Strategic Plan* (Hunter TAFE, 2014) with a strong focus on skills development and training, particularly in technologies relevant to innovation. The *Strategic Plan* will be

superseded with the reorganisation of TAFE NSW currently underway.

In July 2016 the University of Newcastle announced that it had received \$A1m from the NSW Government to support the development of an *Integrated Innovation Network* across the Hunter region. The funding is 'to help the University create an enabling environment where researchers, start-ups and SMEs can undertake multi-disciplinary collaboration and produce the next generation of entrepreneurs' (University of Newcastle, 2016a).

Figure 2
Hunter RDA RIS3 Strategic Actions

Develop inclusive leadership

1. Hunter RDA to facilitate the formation of the *Hunter Innovation Network* as the vehicle for linking businesses and entrepreneurs to services, facilities, and stakeholders to accelerate their innovation and growth, thereby maximising wealth creation in the Hunter Region.
2. Hunter RDA to invite education institutions, industry associations, businesses, and individuals in the Hunter to nominate members to the Board of the Network
3. Hunter RDA to seek \$A1m in annual funding from the Commonwealth and State Governments to facilitate the operation of the Network

Encourage entrepreneurship

4. Encourage schools, TAFE and Universities to offer education and training in entrepreneurship as part of their broader course offerings.
5. Establish a profile of courses and programs in entrepreneurship available to students and business leaders in the Hunter region

Develop the skills for innovation

6. Facilitate a partnership between Business and Business Organisations, the University, Hunter TAFE, private RTOs, Schools, and the Community, to develop an integrated skills development programme that meets the requirements of businesses.
7. Engage with education and training organisations outside the region who are in a position to bring high level skills development and training to the region

Support university-business research collaboration

8. Assist businesses identify research projects that might be suitable as a basis for collaboration with the University of Newcastle and other universities with connections to the Hunter
9. Work with the university and TAFE careers offices to identify a broad range of work based learning opportunities for undergraduate and post graduate students

Build the Hunter Innovation Initiatives Fund

10. Scope and develop the framework for a Hunter Regional Initiatives Investment Fund
11. Engage key stakeholders, including financial institutions, business organisations, and the State and Commonwealth Government in the development of the Fund

Further, the Hunter Innovation Network will work with Hunter RDA to:

- Coordinate Commonwealth, State and Local policies and regional programmes
- Communicate the Strategy

Strategic actions for the Hunter Innovation Network in these categories are:

12. Hunter RDA continue to advocate a collaborative approach to policy and programme development across Commonwealth, State and Local Governments with a view to achieving greater consistency, coherence, efficiency and effectiveness in government services delivery
13. Assist Hunter RDA to develop a comprehensive and integrated marketing and communication plan to promote awareness and engage commitment to the Smart Specialisation Strategy

Figure 3
University of Newcastle NeW Futures Strategic Plan
Driving Global and Regional Impact

We work with partners across the world to build equitable prosperity, social cohesion and healthy communities. We engage with business, industry and government to deliver innovation and impact. We exploit new knowledge to create start-ups, new businesses and new jobs across our regions.

Goals

1. We will be recognised as a lead university for research engagement and for staff mobility between UON and business, industry, government and community organisations.
2. UON will deliver economic impact through commercialisation of new knowledge and job creation as a result of contributions to business improvement, entrepreneurship, the creation of start-ups and new businesses, and the supply of industry ready graduates.

Lead Strategies

1. *Delivering impact:* We will establish at least five UON Global Impact Clusters to address global challenges built on the base of our research concentrations and working across discipline and national boundaries. These GICs will ensure excellence and discovery, drive innovation, business development, commercialisation and impact.
2. *The UON Innovation Hub:* UON staff and students will engage in creative, social and technological innovation and entrepreneurship and be supported to work with partners to create start-ups and new businesses across our regions.
3. *UON Business and Industry Connect:* We will work with industry and business partners to support Associate, Fellow and Professorial appointments who will provide expertise from business and industry and we will support our academics to gain experience working in industry and business. Our Business and Industry Connect strategy will be supported by physical and digital strategies including the integration and collocation of industry and business with academic partners.
4. *The UON Engaged PhD:* Our doctoral training programme will include supervisors from academia, business and industry and will broaden graduate knowledge, skills and attributes; improve the employability of doctoral graduates and facilitate the translation and commercialisation of research outcomes. We will establish a number of Industry Doctoral Training Centres with partner organisations to build capacity in areas of national and global relevance and impact.

Key Measures of Success 2020

UON will have a measurable increased economic, cultural and social impact in our region built on new jobs created as a result of new knowledge, innovation and commercial outcomes leading to business improvement, the creation of start-ups and attraction of new businesses to our regions.

We will be in the top five universities in Australia for engagement with, and support from, industry, business, international partners and the community.

UNIVERSITY OF NEWCASTLE (2016) NeW Futures Strategic Plan 2016-2025. University of Newcastle, Newcastle. www.newcastle.edu.au/__data/assets/pdf_file/0005/225680/2015-1050-NeW-Futures-A4Program_06_Print_WEB.pdf.

The new funding will be directed towards the development of four innovation hubs and finance *innovation vouchers* to leverage *Newcastle Innovation*⁴ in developing relationships with the local start-up and seed investor community to 'create partner-led projects to complement the innovation spaces'. This initiative represents another example of government funding for regional innovation in Australia being channelled through a local university.

The University of Newcastle initiative would appear to be consistent with the evolution of industry-university engagement approaches in Europe. An EU report on the role of universities and research organisations as drivers of smart specialisation (European Commission, 2014) points out that policymakers at the regional level that seek to engage universities and research organisations in RIS3 processes should consider, amongst matters:

⁴ *Newcastle Innovation, the technology transfer arm of the University, was established to connect researchers, industry and investors to facilitate the creation of new products and services. The University supports an early stage venture investment fund, Slingshot, a corporate accelerator programme that brings start-ups and corporates together to build and grow companies. It also supports Jumpstart, a mentor-driven programme designed to assist entrepreneurs in the tech space who want to develop a start-up or scale-up with the assistance of an innovative partner and, most important, a big customer base. The programme offers potential to access to \$A30,000 in seed funding, a structured a twelve-week programme, mentors, and workspace at hubs.*

Invest jointly with HEIs and ROs in programmes that support RIS3 strategies and bring wider benefits to regional businesses and community. Such measures may include: Translational research facilities aligned with the needs and opportunities of the region for example addressing the needs of the ageing population with the help of telemedicine and social innovations which can create new opportunities for enterprise; One-stop advisory services for SMEs that pool together the expertise of all HEIs and ROs in the region; Professional development programmes; People-based mobility between HE and industry that transfer knowledge and innovation to SMEs and other organisations (such as Knowledge Transfer Partnerships in England), and Graduate retention and talent attraction policies that are aligned with the regional priorities (European Commission, 2014).

It is of interest that many of these initiatives are currently being implemented at the University of Newcastle.

Notwithstanding the objectives of strong university engagement with business, a number of obstacles to close university involvement in regional partnerships have been identified. In particular, universities need the freedom to pursue regional goals taking into account their financial, managerial, and administrative capacity and academic objectives. Coupling with global, regional and local dimensions simultaneously has been identified as a challenge for many universities and academics (European Universities Association, 2014). Linking regional economic development with global innovation is both a challenge and an opportunity.

A situation has, therefore, emerged where there is an innovation oriented strategic plan prepared by the Hunter Region's lead university, a series of infrastructure and business development plans developed by multiple government and semi government agencies, and a broad regional innovation and economic development strategy developed by the Hunter RDA - that parallels in many important respects the strategy prepared by the University. These strategies, in turn, are closely aligned with the National Industry Growth Centre strategies (Department of Industry and Science, 2015).

The Hunter RDA RIS3 outcome reflects a high level of continuing engagement with industry and government, and capacity to facilitate relationships between business, particularly small business, multiple government agencies, and the University. Hunter RDA has used its identity as a regional organisation and its knowledge of the RS3 platform to build relationships with regional organisations in Europe, building on the relationship it has established with the EU Centre in Australia and the Joint Research Centre in Seville.

Whilst the Hunter RDA has extended its role into innovation strategy, it does not have a charter or resources for strategy implementation. Resources must come from business, government, or the university. The essence of RIS3 is to achieve some coordination in resource planning and allocation. Through the RIS3 development process, the RDA has become an important innovation intermediary in drawing attention to priorities among innovation system actors, building on its connections with business, government and the research sector.

THE ROLE OF INTERMEDIARIES IN INNOVATION SYSTEMS AND THE TH FRAMEWORK

The TH framework outline in Figure 1 above envisages a key role for intermediaries in connecting research, industry, and government institutions to deliver innovation outcomes.

An innovation intermediary has been defined as an organisation or body that acts as an agent or broker in any aspect of the innovation process between two or more parties (Howells, 2006). They can play a key role in the 'market for knowledge' in relation to the transfer and translation of knowledge and technologies from creators to users in a business (commercial) context. They also have a key role in developing longer term collaborations and partnerships. In this sense knowledge creators include universities, other research organisations, and other businesses.

Intermediaries address a number of gaps in the innovation system. In a study commissioned by the Australian Government, these gaps were categorised as follows (Howard, 2007):

- *Information gaps* - gaps encountered by firms in identifying relevant, useful and applicable techniques for product and service development.
- *Access gaps* - difficulties encountered by firms in accessing technologies and knowledge which they know to exist but are unsure about how to go about acquiring it.
- *Transfer gaps* - negotiation of licence and consultancy/contract agreements, as well as project management. May be beyond the capability of businesses, particularly small to medium businesses.
- *Translation gaps* - transforming knowledge embedded in a technology into a form and format that can be used in product, service and/or business development.

The study identified a range of 'institutional gaps' that are addressed by intermediaries, including: gaps in university technology transfer capability; researcher orientation in industry-academic collaborations; and, limited funding for research organisation - SME collaborations. The study demonstrated that intermediaries had been particularly valuable in addressing these institutional gaps.

The study also highlighted the importance of the personal/professional contribution of intermediary services and intermediary staff to building capability for business-research interactions. In particular, intermediaries need to have excellent communication skills and be exceptionally well networked across industry and the research sector, as well as possessing reputation, integrity, and credibility with business, research organisations, and government program managers.

Practice and experience suggests that intermediary arrangements can be transactional or strategic. That is, arrangements can be put in place for one-off dealings to access or merchandise a particular piece of technology or research project or to establish longer term relationships to engage business and research organisations in addressing new science, technology, and innovation opportunities (Howard, 2009, 2011, 2015).

Intermediaries must understand and acknowledge the way in which universities, research organisations, and businesses work, and differences between institutional formats - in terms of mission, structure, systems, and processes, and the way they measure achievement and rewards success (Howard, 2007).

Whereas intermediaries such as Research and Technology Organisations, formed by industry/trade associations, have become a feature of the British and European regional innovation systems, and have been closely involved in the establishment and operation of an 'interface' between research organisations and business (Howells, 2006; Howells, Georgiou, Evans, and Hinder, 1998), this has not occurred to the same extent in Australia.

Few industry and professional associations in Australia have taken a proactive role in the national innovation system, preferring instead to take on a lobbying role in relation to innovation policy and funding, and focus more on industrial relations agendas. At the regional level associations, may become proactive, although this depends on the strategies of regional boards and capabilities of a CEO.⁵ There is potential for the RDA model to fill a gap in this regional intermediary capability and Hunter RDA provides a case example of what can be achieved.

There are very few intermediary organisations that address the full range of relationships between research, industry, and government. Most focus on the two dimension interactions between research organisations and industry. Government programs that support innovation vouchers and subsidies for researchers in business, have a strong transactional underpinning. In Australia the RDA has emerged as a potential *institution for engagement* that embraces all three dimensions of the TH framework.

HUNTER RDA AND AN INTERMEDIARY IN THE REGIONAL INNOVATION SYSTEM

Given the parallel interests of the University of Newcastle and the Hunter RDA in smart specialisation, and the commitments that the University has in hand, there is potential for the University to take a role in the refinement, implementation and delivery of RIS3 strategies. RDA Hunter would retain a strong and important role in the development of RIS3 through its broad connections with business, the broad range of government agencies, and Commonwealth and State Ministers.

In developing the RIS3 strategy Hunter RDA demonstrated an excellent understanding among stakeholders of the region's capabilities, competencies, comparative advantages and potential for excellence in a global perspective. These had been highlighted by prior work of the RDA through its Scorecard projects and lead roles in implementing an industry led Science, Technology, Engineering and Mathematics (STEM) focused skills and workforce development program.

In a study for the Commonwealth Department of Industry, Science and Tourism, involving a review of a pilot of innovation services (Howard, 2007) the following categories of intermediary role was identified:

- That of a *consultant* - covering assistance through providing information and advice in the recognition, acquisition and utilisation of relevant intellectual property or knowledge and technology capability.
- That of a *broker* - covering 'brokering a transaction between two or more parties'.
- That of a *mediator* - being an independent 'third party' who assists two organisations form a mutually beneficial collaboration.
- That of a *resource provider* - being an agent who secures access to *funding* as well as other material support for the innovation outcomes of such collaborations.

The study drew on earlier work on intermediaries in innovation systems (Howard, 2004a, 2004b; Howells, 2006; Johnston and Howard, 2003).

Each role has different characteristics in terms of knowledge and skills, responsibilities and accountabilities, rules of professional and ethical conduct, incentives, rewards, and remuneration. These roles are provided by people separately, in specialist organisations, or in combination. The nature and business characteristics of intermediary roles is summarised in Figure 4.

Intermediary roles can become compromised where remuneration incentives and value capture favours one side of the relationship more than another. This has tended to occur when commercially oriented intermediaries seek to capture value through provision of additional fee for service consultancy. Similarly, research grant writers, working on a commission basis, may capture up to ten per cent of the value of project funding.

In the preparation of the Hunter RIS3, and in its ongoing work programme, RDA Hunter has demonstrated excellent capability in each of the roles of consultant, broker, mediator, and resource provider (accessing and allocating resources from government and industry). By involving a wide cross section of stakeholders, and funded largely by Government, it has been able to assure independence and objectivity.

In the context of contemporary interest in regional innovation systems, Hunter RDA is developing a vitally important role as an *intermediary organisation*, with a clear mission and purpose relating to both regional innovation and economic development. The RDA has adopted a highly inclusive approach in bringing key actors in the innovation system together in an overarching strategic framework provided by the RIS3 approach.

The RDA is not seen to be pushing any specific political agendas. It has credibility with business, the research and teaching sector and government. Moreover, the approach allows for some separation between contributions to strategy development and responsibilities for strategy implementation in regional innovation and economic development - an approach adopted widely in corporate and public management.

⁵ In the Hunter, AiGroup has taken on a very proactive role in the Hunter regional innovation system, see www.aigroup.com.au/contact/hunter/

Figure 2: Nature and characteristics of intermediary business models

Intermediary Role	Nature of Role	Nature of the Business Model	Nature of the 'Value Proposition'
Consultant	Expert professional advice based on the knowledge, skill and experience of the consultant. In an Innovation context, advice might relate to due diligence, strategic marketing and IP management and technology acquisition	A professional services firm model, providing and selling knowledge-based <i>capabilities</i> . These are reflected in a person's or a firm's reputation and track record, their integrity and their credibility in providing solutions for business and government. A highly contested market with freedom of entry - often a lot of effort goes into marketing capabilities. Consultants are typically paid on a fee for service basis, calculated by salary cost, recovery of direct and indirect costs, and a profit margin.	Creates value through provision of advice that may not have been available or difficult to obtain. Value is reflected in the solution that is provided - which is the total cost of the service Buyers often have difficulty in identifying and capturing value. Implementation is often more difficult and costly. SMEs are reluctant to pay full cost of consulting services – might not be able to afford them, cannot see the value, or both.
Broker	Agent acting for a creator and/or acquirer of sought after knowledge and/or technology. Interprets business needs and 'translates' available capabilities to meet that need. Brokers can also perform an integration role bringing multiple parties together into a collaboration 'deal'. Roles may involve assistance in negotiating contracts, purchases, or sales	An agency model - people acting for either buyers or sellers of knowledge (rarely both) on the basis of their capacity to meet needs through their networks and ability to initiate and negotiate deals. (Acting for both gives rise to conflicts of interest - a reason why brokers are often regulated) An example would be a technology broker, acting on behalf of a client, who identifies/seeks out a technology and works towards creating a deal. Supplements the role of electronic knowledge exchanges. Brokers are typically paid a commission on the value of a transaction or a success fee. They may also be paid on a retainer basis. Government grants may also be paid.	Creates value to parties through a deal being negotiated, or a transaction being completed. Commissions reflect payment for the track record of the broker, a premium for risk (if the deal fails) as well as the overall cost of doing business. Value is reflected in perceptions about the benefits and returns to the party paying the commission in relation to potential longer term returns
Mediator	Introduction, engagement and representation services A go-between who acts as a link between parties Assists in forming collaborations between two or more parties Facilitator in a knowledge network	A network or association model—where people become members and in turn gain access to other people, knowledge and technologies they would not otherwise encounter Members may also have opportunity to meet and communicate in areas of shared and common interest Industry and professional associations perform important mediation roles. Some have specifically tasked mediators There may be one or more mediators In some 'clubs', membership may not be widely known—except to the mediator Mediator organisations are financed by subscription and/or membership fees Governments may provide support/assistance for SMEs to join.	Creates value by people getting to know each other—which may not have occurred Value is in the opportunity and potential to collaborate—which is reflected in the perception about what members are getting from their membership fee Free membership can cause free-rider problems Value is placed on the high level of trust established between and among members. Confidences are respected and preserved
Resource Provider	Provision of resources, such as funds to secure market research, management strategy advice, facilities, and access to knowledge in the form of IP or contract research services.	Grants based model - people and organisations make applications from funding programs in accordance with assessment and selection criteria. For public programs, grants are usually awarded on a competitive basis. Public accountability and probity requires separation of responsibilities between people recommending the grant and people authorizing payment.	Grants provide ability to acquire new capability (knowledge, people, assets), and offset costs, to achieve innovation outcomes

FUTURE DIRECTIONS FOR REGIONAL DEVELOPMENT AUSTRALIA COMMITTEES

The Australian system of RDA Committees is currently under review. The purpose of the review is:

To examine the effectiveness of the RDA programme in delivering the Australian Government's regional agenda and make recommendations regarding its future scope, structure and delivery model, in light of developments in the Australian Government's regional agenda.⁶

As indicated earlier in this Paper, a feature of Australian regional economic development is the existence of a complex landscape of Commonwealth, State, and Local Government agencies with roles and responsibilities for the planning, organisation and delivery of infrastructure and services at a regional level. Australia does not have a system of regional governance and there is, at the moment, little coordination of effort across those organisations.

The RIS3 framework provides a context for regional innovation strategy formulation across this complex backdrop of largely autonomous public and private organisations. This complexity in organisational roles and responsibilities has a potential for *innovation systems failure* where resource allocation and implementation decisions taken in one organisation may conflict with decisions taken in others.

As an intermediary organisation the RDA has the potential to ameliorate these potential system failures. RDA Hunter has a well-developed capacity and capability for continuing representation and advocacy for the region to navigate through the complex public administration arrangements that exist at the regional level.

Commonwealth and State Government agencies also administer a broad range of grant programs for purposes associated with regional innovation. In the Hunter, there are over 130 such programs. In an ideal world, grant applications should point out extent to which proposed actions are consistent with RIS3 research, development, and innovation priorities.

In Europe, Regional Development Agencies (RDAs) provide the following advantages in the development of Smart Specialisation Strategies.⁷ These advantages reflect the way in which Hunter RDA has discharged its mission in an economic development and regional innovation system context. In particular, RDAs can be:

- A relevant institutional arrangement to avoid political lobbying.
- Close enough to the Commonwealth and State agencies, but not only focused on administrative processes.
- Focussed on both innovation and economic development.
- Taking account of the place base dimension in innovation systems
- Providing for innovation leadership from the Board.
- Holding the 'know how' to explain statistics and access to key policy documents and reports.

- Flexible and responsive to regional institutional settings.
- Holders of appropriate level of legitimacy to explain the changes issued from the smart specialisation platform.
- Advocates to keep RIS3 approach alive.

A wider role of RDAs in regional innovation system governance was advocated in a report prepared for the Senate Economics Committee inquiry into Australia's Innovation System (Green and Howard, 2015). The report noted:

... a number of RDA regions have developed or are in the process of developing Regional Smart Specialisation Strategies (RS3). Other regions should be encouraged to go down this track. Smart strategies are oriented towards 'clustering' around key enabling technologies - for example, digital technologies and digital content, biotechnology, nanotechnology, micro/nanoelectronics, robotics, artificial intelligence, and advanced materials in industries that have been identified as offering potential for growth.

In an Australian context, an RDA can operate as both a 'top down' instrument for public policy implementation, and a 'bottom-up' instrument for on-the-ground contacts that generates input for the public policy. They have an important role in partnership with universities in developing the innovation dimension of regional economic development strategy through Regional Innovation Smart Specialisation.

CONCLUSION

This paper has endeavoured to provide some insight into the way in which interactions between the three main elements of the Triple Helix model of university-industry-government interactions operate and can be facilitated using the framework of the Regional Innovation Smart Specialisation Strategy, using as a case example, the Hunter region of NSW, Australia which has recently completed a RIS3 project.

The paper draws attention to the role of RIS3 in extending traditional regional economic development approaches into regional innovation system strategies that can support Australia's current innovation and growth agenda. In addition, the paper points to the potential of Regional Development Australia (RDA) Committees to perform an intermediary role in the development of collaboration arrangements in Triple Helix contexts.

The paper has not explored parallel arrangements relating to UK Local Enterprise Partnerships (Great Britain. Department for Business Innovation and Skills, 2013) and the recently initiated Science and Innovation Audits that aim to build relationships between universities and business (Great Britain. Department for Business, 2016).

Further research will draw on knowledge generated by reviews of coordination and governance arrangements in Europe and the UK and particularly the relationship between national and regional

⁶ <https://rda.gov.au/review/terms-of-reference.aspx>

⁷ http://www.regionalstudies.org/uploads/ARIIT-Saublens-EURADA_Key_role_of_RDAs_SMARTER-_Conference-VF.pdf

innovation systems (Simmonds, Montes, Sharp, Rentel, and Wain, 2014).

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Global Crises - Searching for Solutions

New Options Emerging from the 2014-2020 Programming Period of the European Cohesion Policy: the Italian Experience

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With the programming period 2014-2020, for the first time the Cohesion Policy has been embedded in a vision, the Union strategy for smart, sustainable and inclusive growth, representing a stock of shared assets, a common space made up by priorities, targets, initiatives. Formerly, the Cohesion Policy was requested to face three macro-objectives: convergence, regional competitiveness and employment, and territorial cooperation, entrusting only the national level with the design of the strategic reference framework.

This change is associated with a strong relaunch of the place-based approach to regional development. Actually, the entry into force of the Lisbon Treaty in 2010 added the territorial dimension to the Cohesion Policy.¹

The place-based approach includes local and urban authorities together with regional and national authorities, and conveys a new concept of territory very close to the concept of Triple Helix Spaces [Etzkowitz and Ranga 2011]: endogenous material and immaterial assets and networks of economic, social, cultural, institutional relationships and interactions.

The territory is the place where economy and society meet each other and where become possible to re-build trust and create growth. The main implementation of this approach has been carried out by innovation driven growth policies known with the name of smart specialization strategies,² a leading idea of the Knowledge for Growth expert group (K4G),³ an advisory group to the EU Commission working from 2005 to 2009. Their main conclusions can be summarized by their own words:

“ [...] there is a better alternative to a policy that spreads that investment thinly across several frontier technology research fields [...] to encourage investment in programs that will complement the country's other productive assets to create future domestic capability and interregional comparative advantage.”

As smart specialization strategies try to accumulate new knowledge to put in productive use in order to build innovative applications, goods and services, and even new sectoral domain by fostering cross-sectoral links, cooperation and creating new capabilities for future economic evolution, the same interactions and new capacity building should characterise policies.

¹ The article 174 of the Treaty on the functioning of the European Union provides that in order to promote overall harmonious development, the Union shall develop and pursue actions leading to the strengthening of economic, social and territorial cohesion.

² www.ec.europa.eu/invest-in-research/pdf/download_en/kfg_policy_brief_no9.pdf | | | | |

³ www.ec.europa.eu/invest-in-research/monitoring/knowledge_en.htm

Identifying and mobilising endogenous resources, knowledge, skills, and capabilities to build a shared vision about the future of a region and then co-managing its implementation with stakeholders required to increase the quality of governance capability both in public and private spheres.

Smart specialization strategies are based on an innovative governance system which potentially represents a way to deal with the crisis by furthering the innovation driven dynamism of our economies and considering the sustainability related issues of development trajectories.

For a long time, Europe haven't proposed its own specific governance models for growth.

The birth of European research and innovation policies dates back to 1985 with the EUREKA initiative, to assure the technological independence of Europe in the key domains of the future and to encourage, wherever possible, co-operation between European businesses and researchers [Mitterrand, 1985].

EUREKA did not deal with the governance related aspects of the European research agenda. It was a replay of the Strategic Defense Initiative (SDI), an extensive research programme set up by the US government in 1983, with a ten year budget of \$ 44 billion.

Nevertheless, EUREKA brought about the creation of a cooperative environment in the R&I field which led to the establishment of the European Research Area, some years later.

The European Union has been a driven force for the globalization of the economy. Each main stage of the European integration process has opened new GATT (General Agreement on Tariffs and Trade) rounds. For instance, the process of a radical re-design and re-launch of a large European market in the late 1980s coincided with the Uruguay round that led to the creation of WTO, the entering of new economies in a global market and the integration of multinational supply chains. However, while the EU contribution to the change of the global economy structure has been relevant, for years Europe has suffered from a lack of a growth model able to cope with these changing patterns.

Smart Strategies merge the knowledge production of the Helix model and the entrepreneurial discovery process. According to the Common Strategic Framework, smart specialization strategies "shall be developed through involving national or regional managing authorities and stakeholders such as universities and other higher education institutions, industry, and social partners, in an entrepreneurial discovery process" [CSF, section 4.2, paragraph 2].

In the current programming period, Research and Innovation Strategies for Smart Specialisation [RIS3] are an *ex-ante* conditionality for the use of 'European Structural and Investment Funds', resources devoted to the thematic objective of "strengthening research, technological development, and innovation".

The governance scheme relies on a few fix elements, but it remains a space of experimentation and exploration. This explains the great success of RIS3 far beyond being an *ex-ante* conditionality. In Italy, for instance, twenty-two RIS3 have been developed, one national and twenty-one regional. Dynamism is a fundamental variable for

growth as for organizational aspects.

The fix elements coincide with the criteria for the *ex-ante* conditionality fulfillment and reflect the need to be aware about the strengths, weaknesses and territorial distribution of entrepreneurial knowledge; activate a clear mechanism for reassembling fragmented knowledge and capabilities in new stocks and flows of productive knowledge and building an innovation matrix; and combine programming with financing,, enhance structured and interactive learning processes based on monitoring and evaluation mechanisms.

Designing RIS3 in this programming period has been an extraordinary experience of resource mobilization but the success now relies on the implementation phase, specifically on transforming the co-designed priorities into co-managed initiatives.

Implementation phase governance should ensure a dynamic and collaborative process of decision-making relationships and interactions able to express a leadership representing all levels of government, and all stakeholders, in order to integrate and exploit territorial strengths, widen the industrial and technological components competing in global markets, and strengthen activities and subjects that can support the development and qualification of domestic demand, contributing to its growth.

In Italy, all RIS3 establish implement governance systems where stakeholders play an active role to move into the action phase. However, monitoring and communication will be crucial to make this process effective.

In the Italian institutional framework, the Agency for Territorial Cohesion (ATC) is in charge of the implementation phases of the national and EU Cohesion Policy programmes, by performing a systematic and continuous monitoring function, supporting the improvement of a projects quality and effectiveness, providing accompanying measures, as well as support and technical assistance, and promoting special and innovative projects, playing the role of Managing Authority of specific Operational Programmes with the NOP for Governance and Institutional Capacity.

The Agency is also directly involved in the National RIS3 governance mechanism, as part of the governing body (Cabina di Regia) for competent issues, performing technical functions within the governing body itself and working closely with the relevant central, regional, and local authorities, to boost administrative actions and promoting convergence of public and private resources on development trajectories.

A large part of Agency activity is devoted to governance issues, since a country's success is mainly based on its institutional competitiveness. Some projects specifically concern institutional experiments on the implementation of the European code of conduct on partnership in the framework of the European Structural and Investment Fund. The Agency intends to develop pilot projects focused on the consensus space combining the Helix model with the behavioral insight approach to improve information flow management in the decision making process in a multilevel and multi-stakeholder environment and to design regional development policies able to maximize the private and social actors participation to improve the economic and social outcomes of public actions.

The Entrepreneurial University in the Construction of the Science, Technology, and Innovation Legacy (S, T & I): a Proposal from Rio 2016 Olympic Games

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The 2016, the Olympic Games took place in Rio de Janeiro, Brazil, from 5-21 August 2016. Several activities were developed in parallel to the Games, among these was the academic event titled "Public Debate on Innovations in Legacies of the Olympic Games" on 11 August 2016 at Santa Ursula University, in Rio de Janeiro.

At that time, researchers of the project "A Innovation Grade Study about the Brazilian Technological Based Firms - TBF, Incubated Academic *Spin-offs*", supported by the National Counsel of Technological and Scientific Development" - CNPq, presented the preliminary results of the research, among which a new theoretical understanding was highlighted that extends the concept of legacy of mega sporting events. It is the scientific and technological legacy focused on innovation, based on investments of the government and private sectors in laboratories and persons' infrastructure for conducting research and innovation, resulting in the development of new products and/or services and in the creation of new businesses in the sports area.

Major sporting events, because they are trans professional, are directly linked to various economic segments, since their inherent activities require a variety of products, ranging from clothing to medical technology and infrastructural services, and it is up to society to identify and take advantage of the opportunities provided by this medium. Because the sports production sector is 'transversal', in that it embraces a variety of different areas of knowledge in order to meet the specific demands, whether in sports education, in competitive sport or in physical activities aimed at promoting health, the learning provided by the universities to society should include teaching, training and research. These approaches are able to outreach the university-industry-government interaction as a means of bringing about extensive regional impact that, in practical terms, might as well be considered an effective entrepreneurial legacy of such sporting events (Terra et al, 2011).

Therefore, the sporting events legacy is not restricted only to economic results, cultural and sports infrastructure, networks of mobility, environmental improvement as inter alia Deslandes, DaCosta and Miragaya (2015) have previously demonstrated.

According to Chappelet (2016), who gave a lecture in the Debate mentioned above, after the games, impacts cover the areas: 1) economic (economic activity, tourism, jobs, taxes and foreign Investments); 2) sociopolitical (notoriety/image, evictions, volunteerism, protests and education/participation)) and

environmental (construction, soil/water, energy, transportation and waste). Among the socio-political impacts, showed strong impact on the knowledge of organizers, the workforce, the volunteers and the strong feel good factor if the Games are well organized.

Furthermore, Spilling (1996), pointed out that based on previous experiences of countries that have hosted international sporting competition mega events, it has shown that the legacy for the host city also covers impacts generated by new entrepreneurial performance in the region, which can affect various economic sectors.

In Brazil, the prospect of hosting Several sports events, like the Football World Cup in 2014, the World Military Games in 2011, the Cup of Football Confederation in 2013, and the Olympic and Paralympic Games in 2016, as well as the experience of hosting the Pan American Games and Parapan Games in 2007, has stimulated discussion about the holding of such 'mega-events' and their legacy for the cities and regions which host them. This has extended into the academic sphere debate with scientific gatherings taking place and publications on the topic being released (DaCosta et al, 2008). At the same time, bodies, agencies, and government that supported scientific research have included, among their tendering invitations, themes devoted specifically to innovation in the field of sport, on the understanding that the country could use this opportunity to become a producer of sports solutions and not just a buyer.

Thus far, there is a favorable environment in Brazil for stimulating technological innovation in business, including non-repayable financial resources, subject to approval and the regulations of the Innovation Law (2004, 2005). Similarly the launching of federal government economic programs, such as the Plan for the Greater Brazil (2011-2015), seeks to provide continuity and expand upon the industrial policy measures that had previously been introduced: PITCE - industrial, Technological and Foreign Trade Policy (2003-2007) and PDP - Policy for the Development of Production (2008-2010), (Terra et al, 2013).

Whereas Brazil has a low degree of innovation in firms (Brazilian Innovation Survey -PINTEC, 2013) the major sports firms that develop R&D are international brands which characterize the country as innovative consumer and not a producer in sports tools. The government initiative to encourage innovation in sport might generate a legacy in S, T & I in this sector, hitherto non-existent.

Within this context the research turned to innovative firms located in incubators linked to universities and for the identification of the

interactions developed among universities-industries-government, focused on the economic and social developed based on innovation.

This was possible because of the existence of incubators linked to universities and research institutes. The scientific and technological support that encouraged innovation in firms, as the country was preparing for sporting events, resulted in a S, T & I legacy, that in the Brazilian case had significant participation from entrepreneurial universities, as a source of knowledge of new products and services, which created in start-ups, with government support.

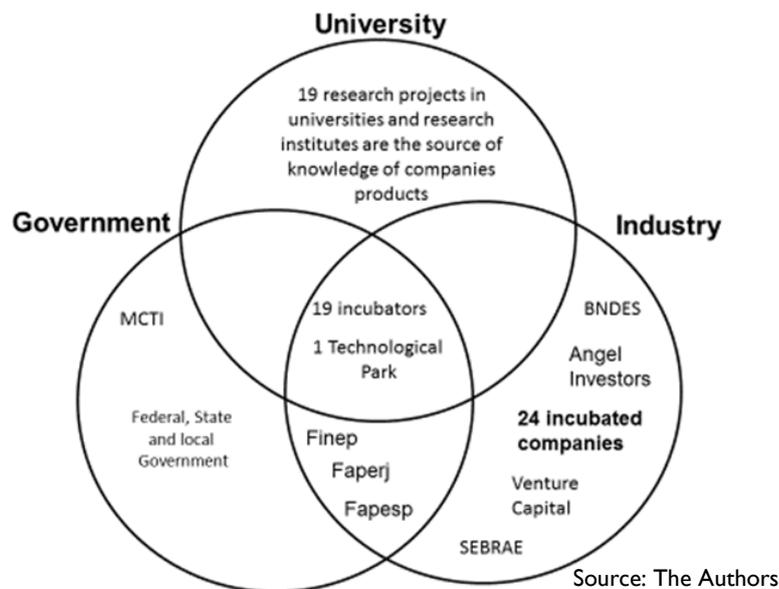
This identification of interactions developed between university-industry-government focused on the development based on innovation characterizes the Triple Helix of social and economic development of regions (Etzkowitz and Leydesdorf, 1995), as well as in the particular case of the Triple Helix of innovation in sport in Brazil.

During the research cited project authors identified that the period from 2010 to 2014, there were 148 sports innovation research and development projects presented by universities, institutes and firms research, totaling eight calls for proposals (Support Program for Innovation Development in Sport in State of Rio de Janeiro by Carlos Chagas Filho Research Agency of the Rio de Janeiro State - FAPERJ, in 2010, 2012, 2013 and 2014; Public Selection of the Sports Ministry - ME/CNPQ number 91/2013 - Sport, Leisure & health - Projects of scientific research, technology and innovation, geared towards the development of sport in its different dimensions by CNPq/ME, in 2013; Public Selection 01/2012 - Science, Technology and Innovation Ministry - MCTI/Financier of Studies and Projects - FINEP/National Scientific and Technological Development Fund - FNDCT - Innovative Assistive Technology Products Training and Practice Paralympic Sports (Economic Subvention) by FINEP in 2012; twenty-six Young Scientist Awards by CNPq/Foundation for Research of the State of São Paulo - FAPESP/Roberto Marinho Foundation, Gerdau and General Electric - GE in 2012 and Project COPA 2014-Bis by the FINEP/MCTI, in 2010) which have provided an around US\$ 20,000,000.00 from the federal government and from the state governments of Rio de Janeiro and São Paulo (Martins et al, 2016).

Extensive research was also carried out in 430 Brazilian incubators, from all regions of the country, searching for incubated spin-offs/start-ups that were developing products and/or services in the sports innovation area. It was verified that nineteen incubators had twenty-four firms, located in seven states, had products and services related to the sports field.

In the first phase of the survey, researchers met nineteen incubated firms where the source of knowledge for the development of innovation were research projects, theses, dissertations, under graduate final papers, and scientific research. In the second phase of the research, still in progress, the degree of innovation of these firms has been identified.

From the information collected during the research with the identification of firms in incubators, the following figure shows the configuration of the Triple Helix highlighting the role of each propeller institutions:



The configuration of the Triple Helix in the development of innovation in sport in Brazil highlights the important role of the entrepreneurial university in the construction of the S, T & I Legacy from the Rio 2016 Olympic Games. Moreover, future research in the sport innovation area will need the creation of indicators to define the impact of legacy, expressing the characteristics and level of coverage of the achievements in the period of preparation, realization, and post hoc realization of mega sporting events.

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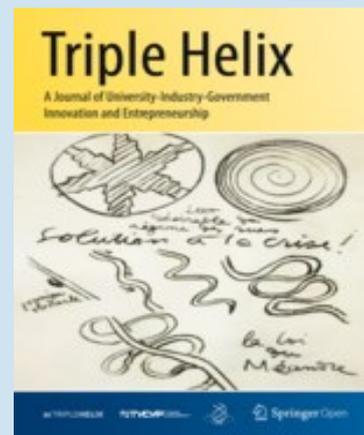
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IITH Blog | November 14, 2016 at 02:06 AM EST

"Soft Secession": A turn to the States for US S&T Policy in the Trump Era

In rejecting the scientific evidence of climate change and intending a withdrawal from the Paris agreements, the incoming administration is anti-science to an order of magnitude beyond, but on the same track as the George W Bush Administration. President Bush placed severe restrictions on federal government funding of stem cell research early in his administration. The Obama Administration eventually ended these restrictions by executive order but they may well be reinstated by the incoming administration even though it has not yet been mentioned as a policy priority.

In response to the negative Bush stem cell policy the State of California instituted its own funding program for stem cell research (Etzkowitz and Rickne, 2014). The California Institute of Regenerative Medicine arose from a bottom-up coalition of patient advocates, scientists, and venture capitalists that placed a measure on the ballot in 04 may provide a model for other issues. States like California, New York, Illinois, and others, can take leadership in science, technology and social policy. During the Progressive era of the early twentieth century measures that later became national policy during the Roosevelt Administration had already been instituted in Wisconsin. In the current situation, policies rescinded at the national level may have to find their support at the state and local levels.

California is the world's sixth largest economy as has been noted by the venture capitalist who is proposing to fund a secession referendum to remove the state from the Union in response to the election results. A soft secession approach focused on specific issues may have more practical effect. California has long had an outsized effect on US environmental policy, starting with smog standards for automobile emissions that became de facto national policy even before congressionally mandated. Due to the size of the California market, automakers followed the California standards and developed technology to meet its criteria that was marketed nationally. California may consider similar policies to replace any gaps opened up at the federal level.

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Henry Etzkowitz

THEMATIC RESEARCH GROUPS (TRGs)

ACHIEVEMENTS AND OUTREACH: 2015-2016

The first Thematic Research Groups (TRGs) of the Triple Helix Association were established in 2014 to strengthen the Triple Helix research field. Leading scholars and practitioners around the world were appointed as Conveners of the Groups, focusing their efforts on consolidating an area of expertise that has emerged within the Triple Helix community. These TRGs represent open societies with their LinkedIn discussion forums, on-line and off-line interactions towards deepening our knowledge of different aspects of the Triple Helix field, and strengthening the theory and practice.

Collectively, the TRGs have helped to focus research and scholarly activities on measurable concepts and insightful frameworks that enlighten the generic Triple Helix model and advance our interdisciplinary project. TRGs have also mobilised a broader community that brings together theory and practice and generates synergies of university-industry co-creation beyond traditional scholarly work.

The TRGs of the Triple Helix Association are calling for new members that will enrich the portfolio of activities and give a new impetus for advancement of our knowledge and practice in bringing the government, industry, and university on the same level platform as co-creators of our sustainable future.

Congratulations to our TRG conveners for their hard work and wishing them success in the forthcoming year ahead! We hope that the TRG column in the THA Hélice Magazine continues to be populated with new initiatives, calls for papers, and actions.

Thematic Research Group	Conveners	Website
Entrepreneurial Universities	Yuzhuo Cai Karen Barranon	www.triplehelixassociation.org/th-thematic-research-groups/entrepreneurial-universities
National Innovation Systems and Models	Luiz Marcio Spinoza	www.triplehelixassociation.org/th-thematic-research-groups/national-innovation-systems-models
University-Industry Partnerships	Panayiotis Ketikidis Juan Bertolin	www.triplehelixassociation.org/th-thematic-research-groups/university-industry-partnerships
Knowledge and Technology Transfer	Hester Tack	www.triplehelixassociation.org/th-thematic-research-groups/knowledge-technology-transfer

PAPERS AND PUBLICATIONS

Borim-de-Souza, R, Balbinot, Z, Takahashi, A W, Munck, L and Travis, E F. (2015) Sustainable development and sustainability as study objects for comparative management theory: proposing styles of reasoning for an unknown metropole. *Cross Cultural Management*, 22(2), 201-235.

Cai, Y. (2015) What contextual factors shape 'innovation in innovation'? - integration of insights of the Triple Helix and the institutional logics perspective. *Social Science Information*, 54(3), 299-326. doi: 10.1177/0539018415583527.

Cai, Y. (Forthcoming) From an analytical framework for understanding the innovation process in higher education

to an emerging research field of innovations in higher education. *Review of Higher Education*.

Cai, Y and Liu, C. (2015). The roles of universities in fostering knowledge-intensive clusters in Chinese regional innovation systems. *Science and Public Policy*, 42(1), 15-29. doi: 10.1093/scipol/scu018.

Cai, Y and Yang, X. (2016). Mergers in Chinese higher education: lessons for studies in a global context. *European Journal of Higher Education*, 6(1), 71-85. doi:10.1080/21568235.2015.1099458

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mergers in higher education. *European Journal of Higher Education*, 6(1), 7-24. doi:10.1080/21568235.2015.1099457.

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Cai, Y, Pugh, R and Liu, C. (Forthcoming) A framework for analysing the role of innovation policy in regional innovation system development. *International Journal of Innovation and Regional Development*.

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- Pinheiro, R, Wengenge-Ouma, G, Balbachevsky, E and Cai, Y. 2015. The role of higher education in society and the changing institutionalized features in higher education. In *The Palgrave International Handbook of Higher Education Policy and Governance*, edited by J Huisman, M Souto-Otero, D D Dill and H de Boer, 225-242. Basingstoke: Palgrave Macmillan.
- Reyes, C N. (2016). Framing the entrepreneurial university: the case of the National University of Singapore. *Journal of Entrepreneurship in Emerging Economies*, 8(2), 134-161. doi:10.1108/JEEE-09-2015-0046.
- Rowlinson, M, Harvey, C, Kelly, A, Morris, H and Todeva, E. (2015) Accounting for research quality: research audits and the journal rankings debate. *Critical Perspectives on Accounting*, 26, February 2015: 2-22. DOI:10.1016/j.cpa.2013.05.012.
- Shumilova, Y and Cai, Y. (2016). Three approaches to competing for global talent: role of higher education. In B Krishna and F Charlotte (Eds), *Global Perspectives and Local Challenges Surrounding International Student Mobility* (114-135). Hershey, PA, USA: IGI Global.
- Spinosa, L M, Bollmann, H. (2015) Sustainability assessment of urban innovation ecosystems - the case of Curitiba. Working Paper. Post-graduation Program on Urban Management. Pontifical Catholic University of Paraná, Brazil, 38 pp.
- Spinosa, L M and Bollmann, H. (2015) Urban innovation ecosystems and sustainable development - a broader approach for sustainability assessment. Working Paper. Post-graduation Program on Urban Management. Pontifical Catholic University of Paraná, Brazil, 32 pp.
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- Spinosa, L M, Schlemm, M M and Reis, R S. (2015) Brazilian innovation ecosystems in perspective: some challenges for stakeholders. *Rebrae. Revista Brasileira de Estratégia (Impresso)*, v 8, 386-400.
- Todeva, E. (2015) Market driven clusters as prerequisites and consequences of smart specialisation. *Journal of the Knowledge Economy*, 6:250-269. DOI:10.1007/s13132-014-0221-8.
- Todeva, E. (2015) RIO Country Report Bulgaria 2014. JRC Science and Policy Report, European Commission, Institute for Prospective Technological Studies, ISBN 978-92-79-49231-0, doi:10.2791/634274.
- Todeva, E and Danson, M. (2016) Regional dimensions of the Triple Helix model. *Industry and Higher Education*, 30(1): 5-12, DOI: 10.5367/ihe.2016.0294.
- Todeva, E and Rakhmatullin, R. (2016) Industry global value chains, connectivity and regional smart specialisation in Europe. An overview of theoretical approaches and mapping methodologies. JRC Science for Policy Report, European Union, EUR 28086 EN; ISBN 978-92-79-61508-5, doi:10.2791/176781, www.s3platform.jrc.ec.europa.eu/documents/20182/154989/JRC102801_lfna28086enn.pdf/04c2d91c-1e88-458d-a61c-4a5a12b42653.
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MEETINGS, EVENTS, CONFERENCES, WORKSHOPS ATTENDED OR ORGANISED

- XIV International Triple Helix Conference, 25-27 September 2016, Heidelberg, Germany. Organised the following tracks:
 - Entrepreneurial University and its Socio-Economic Impact*
 - Entrepreneurial University and Regional Innovation Systems*
 - Science Parks and Incubators - New Frontiers*
 - Regional Dimensions of Triple Helix - Clusters, Cities and Geographic Boundaries*
 - Innovation Clusters and Cluster Initiatives as Practical Implementation of Triple Helix Collaboration*
 - Boosting Innovation and Growth through University-Industry Co-Creation*
 - Individuals in the Triple Helix*
 - Business Led Triple Helix and the New Role of Government*
 - Are we facing a New Generation of National Innovation Systems?*
 - Advancing New Models and Tools for Knowledge Transfer*
 - Triple Helix Model and Knowledge Creation in Developing Countries*
 - Triple Helix: Gender, Entrepreneurship and Diversity*
- XIII International Triple Helix Conference, August 2015, Beijing, China
 - The THA Thematic Research Group (TRG) Entrepreneurial University organized a workshop on *The Future of the Entrepreneurial University* on 24 August, 2015, at Beijing Normal University. It was a one-day workshop on exploring the topic of the entrepreneurial university from multiple perspectives. Thirty participants from various countries attended the event.
 - Regional Studies Association Conference - TRG members participated in the Institutional Theory Workshop.
 - ASAC 2016 - article presented, L'adaptation de la publicité expliquée par les dimensions culturelles.
 - Danish Wind Association - Workshops and Posters.
 - Conect International Symposium, 10-11 September 2015, Berlin - presentation by Professor Yuzhuo Cai, the Convener of the THA Entrepreneurial Universities Thematic Research Group.
 - Intelligences Numériques 2016 - article presented, Lien de confiance sur les réseaux sociaux : une typologie des stratégies communicationnelles entre les entreprises et leurs consommateurs.

- THA Webinar - Fostering the Innovation in Brazil - an Industry Project, by Celson Pantoja Lima.
- THA Webinar - Developing Innovation Ecosystems, 24 September 2015 - Innovation Ecosystems and Knowledge Based Urban Development - An Analysis of the Brazilian system, by Luiz Marcio Spinosa.
- UNIKE (University in Knowledge Based Economy) Conference in June, 2016.
- World Comparative and International Education Society Conference in August 2016.
- University Industry Interaction Network (UIIN) Conference (June 2016, Netherlands).
- 9th ICEIRD (International Conference for Entrepreneurship, Innovation and Regional Development), June 2016. Romania.
- Oman Entrepreneurship and Venture Capital Conference (December 2015)

INVITED SPEAKERS

- Ketikidis, P. Roundtable Discussion: Digital Europe: Growth and Innovation promote Entrepreneurship - the EU gives SMEs priority for growth (March 2016, Greece).
- Ketikidis, P. Roundtable Discussion on Triple Helix Interactions during the Ninth Conference on Innovation and Development (December 2015, Greece).
- Ketikidis, P. Roundtable Discussion on Triple Helix interactions for Entrepreneurial Support during the Oman Entrepreneurship and Venture Capital Conference (December 2015, Oman).
- Todeva, E. Emerging Scientific Discourses and Triple Helix Theory - Welcome address at the XIV International Triple Helix conference, 25-27 September, Heidelberg, Germany.
- Todeva, E. The Emerging Model of Regional Triple Helix, Keynote presentation at the Eighth International Conference for Entrepreneurship, Innovation and Regional Developments (ICEIRD), Bucharest, Romania.
- Todeva, E. Smart Regions Conference: Driving Smart Specialisation Investments in priority Areas for European Growth, 1-2 June 2016, Brussels, Belgium.
- Todeva, E. Industrial Modernisation and Smart Specialisation: Value Chain Strategic Development Model for Inter-Regional Cooperation, 11 May 2016, Brussels, Belgium.
- Todeva, E. Deter or Comply? Theoretical Tensions between Regulation, Governance and Strategic Behaviour, Keynote presentation at the Workshop on Strategic Governance, University of Sao Paulo at Riberão Preto, 14 April 2016, Riberão Preto, Brazil.
- Todeva, E. Measuring Innovation in Europe for Future Growth, Keynote Seminar for Innovate Limited, 20 January 2016, Dubai, United Arab Emirates.

PARTICIPATION AND MEMBERSHIP IN AFFILIATED SOCIETIES THAT CONTRIBUTE TO THE TRIPLE HELIX AGENDA

UIIN	University Industry Interaction Network
BIN	Business Innovation Network
EBAN	European Business Angel Network
HeBAN	Hellenic Business Angel Network
AIB	Academy of International Business
MOPAN	Multi-Organisational Partnerships, Alliances & Networks
HICSS	Hawaii International Conference on System Science
SOGBED	International Conference of the Society of Global Business & Economic Development
EURAM	European Academy of Management
RSA	Regional Studies Association
EAIR	European Association of Institutional Research
CHER	Consortium of Higher Education Researchers
	New Institutionalism Association

RESEARCH PROJECTS: UNDERTAKEN AND ON-GOING

- NetMIB - Network of Multidisciplinary Business Model Innovation and Ideation (ERASMUS+ Project)
- Innovations frugales pour l'insertion de la base de la pyramide dans le XXI siècle (on-going).
- Commercialization of innovation across borders: the impact of the distances (on-going).
- Le management comparatif et les avantages compétitifs internationaux.
- L'innovation et le développement durable.
- L'impact de la "distance technologique" lors du processus d'internationalisation des entreprises de haute technologie brésiliennes.
- Innovation Ecosystems: an analysis of components for public policies and knowledge-based urban development. UC Berkeley, Visiting Scholar Project.
- Offshore Wind Denmark; in the future planning to make a pilot project on 'Strategic innovation in harbour spaces', which has a Triple Helix framing.

RESEARCH APPLICATIONS SUBMITTED

- H2020 Call - SCIENCE WITH AND FOR SOCIETY (SWAFS) proposal submitted.
- Promoting regional innovation and resilient society in a global context - for the theme topic of Academy of Finland's strategic funding 2017-2018.
- Les nouvelles applications mobiles en Afrique de l'Ouest.
- Innovations frugales pour l'insertion de la base de la pyramide dans le XXI siècle.
- VSPA Innovation HUB. UC Berkeley, Joint Project between UC Berkeley and Pontifical Catholic University (BR).
- Offshore Wind Denmark, submitted pilot application.

MEDIA/PUBLIC PARTICIPATION

- CBC, Radio Canada, La Presse, Les Affaires (all in Canada, mostly in the Quebec province).
- Press Release on comments to statistical analyses in the Danish Wind sector were made and also comments to our report on the offshore wind industry has been made to the press – www.ipaper.ipapercms.dk/Windpower/OWDrapport.
- GAZETA DO POVO, press release on innovation ecosystems and urban development.

OBSERVATIONS: HOW THE FIELD (TRG THEME) IS DEVELOPING

- From our ecosystem's perspectives, there is more movement of staff among the two institutions (university and industry), especially due to EU funding which had been acquired. Without such funding (or similar), there is little willingness to interact.
- Still embryonic. The research field is developing very fast with researchers participating interdisciplinary regarding the innovation challenge to transcend national innovation systems as highlighted in the 2016 Triple Helix conference.
- International workshops and company sensibilization.
- Enhance research on transcending national innovation systems for strategic innovation to make a difference in ecosystems.
- We have identified a number of gaps/research questions to be tackled:
 - How to conceptualise and theorise the entrepreneurial university for both research and application-oriented higher education institutions with consideration of the local context?
 - The role of the entrepreneurial university beyond its contribution to technology transfer and for regional economic development. Eg. the role of the entrepreneurial university in changing the institutional environment for better construction of the Triple Helix system?
 - What are the challenges or unintended consequences in the process of developing the entrepreneurial university?
 - Do we have alternative ways to resolve the problems that the model of the entrepreneurial university is used to address?

FUTURE INITIATIVES, PLANS, IDEAS: HOW TO ACCELERATE DEVELOPMENT OF THE FIELD

- To apply for funding and recruitment of more PhD students in this field.
- To integrate (to a greater extent) university operations with industry.
- To develop a special issue on the topic of the entrepreneurial university mainly based on 2016 TRC papers.
- To collaborate with the Entrepreneurial University Metrics project.
- To initiate a research project and seek appropriate funding sources

RECOMMENDATIONS TO THE THA:

HOW TO INCENTIVISE PARTICIPATION AND SUPPORT ACTIVITIES OF THE TRGs

- Disseminate the UIP TRG in order to attract more members.
- Develop focused workshops on specific topics.
- Work intensively to develop international research projects, which can attract funding and interdisciplinary Researchers.
- How to incentivise participation:
 - To exempt first year membership fee when joining a TRG.
 - To provide support for member's publication (eg. peer review before submission to a journal, the member could cross review each other's paper).
 - To share information concerning funding/work/study opportunities to members.
 - To promote the TRGs, and interact with TRG members via social media.
- How to support activities of the TRGs:
 - To provide opportunities to organise tracks on themes at each THC as organised this year.
 - To support promotion and activities of TRG through THA's professional networks.
 - To facilitate inter-TRG cooperation.

CHAPTER NEWS

THA Chapters showcased at the 2016 General Assembly

The activities, achievements, and future plans of the Greek Chapter, represented by Professor Panos Ketikidis; the Russian Chapter, represented by Tatiana Poespelova; and the South Asia (SATHA) Chapter, represented by Professor Abid Shirwani; were presented on 26 September 2016 during the THA General Assembly in Heidelberg.

The crucial role of Chapters in catalyzing Triple Helix debate and in producing an impact at regional level has been confirmed by the results presented by the Chapters' leaders. Chapters' presentations are available on the THA website at www.triplehelixassociation.org/executive-committee.

The THA encourages the creation of new Chapters in Europe and Third World countries for mainstreaming TH research and development, and for igniting, feeding, and further developing local interactions with and among TH actors.

Existing organizations (universities and affiliated units, research institutions, innovation intermediaries, governmental bodies and other public and private bodies), or a group of people (represented by a legal person) interested to become the local interface of the THA and the center of TH debate in their own countries, can submit their Chapter application to:

Professor Mariza Almeida, Vice-President and Co-Chair of the Marketing and Membership Committee
(mariza.almeida@unirio.br)
Maria Laura Fornaci, Executive Director
(mlaura.fornaci@triplehelixassociation.org).

Guidelines for applications are available at www.triplehelixassociation.org/tha-chapters.

CHAPTER OF GREECE



International Conference for Entrepreneurship, Innovation and Regional Development

University-Industry Links: Coproducing Knowledge, Innovation and Growth

31 Aug – 1 Sept 2017

Makedonia Palace Hotel 5*, Thessaloniki, GREECE

CALL FOR PAPERS

The aim of the Conference is to foster stronger university-industry links, and the theme of ICEIRD 2017 is: University-Industry Links: Coproducing Knowledge, Innovation & Growth. To achieve this ICEIRD is looking to promote the dialogue and knowledge exchange across these communities, through the participation of academics, commercialization practitioners, policymakers, entrepreneurs, innovators, and businesses (companies) in order to enhance the impact of university-industry links to the growth potential of countries.

SUBMIT AN ABSTRACT

The deadline for the submission of abstracts (max. 500 words) is December 12, 2016.

Please submit the abstracts and proposals through the online submission form available at: www.iceird.eu/2017/submission.

Abstracts will be reviewed by an international scientific and industry and business committee with a double blind review process.

CHAPTER OF SOUTH ASIA (PAKISTAN) SATHA

SATHA Partners in International Business Conference and Exhibition (IBCE)

SATHA (South Asia Triple Helix Association) in partnership with the University of Management and Technology, Lahore, organized a two-day conference and exhibition at the EXPO Center Lahore, Pakistan. The conference was held on 7-8 November 2016.



The aim of this event was to provide a platform to national and international businessmen and academicians for collaboration and partnership in research and innovation. Furthermore, the exhibition accompanying the conference was aimed to bring together top brands in business to initiate joint business ventures and explore investment opportunities of mutual interest. The objective of the event was to build the capacity of stakeholders by creating strategic linkages between business, academia, and government with a multiplier effect on trade and economic development in Pakistan under the Triple Helix concept.

The most interesting part of the two-day conference were the back-to-back business panel discussions on different topics. The aim of the conference tracks was to gather the most fertile brains from the area of industry, academia and government to express their thoughts on the burning issues of the market and business world. Speakers from the UK, US, China, Malaysia, Australia, Turkey, Italy, Dubai and Pakistan took part in the conference.

The opening session of the conference was attended by people from academia, industry and government.

The SATHA President, Mr Abid H K Shirwani, made the opening speech and highlighted the core objectives of the conference.

The closing speech was made by Dr Hasan Sohaib, Chairman SATHA, and Rector, the University of Management and Technology (UMT) Murad, who shared his vision on the promotion of academic collaboration with the business world.





*Dr Hasan Sohaib
Chairman SATHA*

The closing speech was made by Dr Hasan Sohaib, Chairman SATHA, and Rector, the University of Management and Technology (UMT) Murad, who shared his vision on the promotion of academic collaboration with the business world.

A presentation on the Triple Helix Association (THA) was made by Dr Emanuela Todeva, Director BCNED, and Chair of the THA Scientific Committee. She had been invited to the conference by the President of SATHA to share her views on the Triple Helix agenda in developing countries. In her speech, she gave a detailed introduction of the Triple Helix concept and its application in the developing world.



*Dr Emanuela Todeva
Chair THA Scientific Committee*

More than 30 international and 100 local exhibitors of 120 enterprises from Turkey, China and other countries attended the event and displayed their products. Companies from different sectors included automobile, textile, manufacturing, services, housing, construction, food and agriculture participated in the exhibition.

A B2B meeting segment was organized, where the Turkish, Chinese and other foreign businessmen held substantive meetings with their Pakistani counterparts. Escorted visits were arranged for the TUMSIAD delegation from Turkey to the Lahore Chamber of Commerce and the Sunder Industrial Estate, Lahore.

The participants of the conference were invited to a Sufi Night Dinner on the green grounds of UMT. During the dinner folk singers performed traditional music which was much appreciated by the audience.

The two days conference and exhibition brought thousands of business leaders under one roof and many businesses really expanded their customer base during this event.

The management of the conference have decided to hold the conference again in 2017.



The Exhibition Area



**Abid H Khan Shirwani (President SATHA)
Khalil Arbi, Executive Vice President SATHA)
Rahmat Ullah (Secretary SATHA)**

NEW THA MEMBERS JULY 2016 - NOVEMBER 2016

We are pleased to welcome and present new THA members joining our Association between July and December 2016.

The THA membership is growing constantly and can now rely on an international base of more than 150 individuals and organizations, from five different continents, and including university, scientific-research institutes, incubators, science parks, private companies and governmental institutions representatives.

We are delighted to see our Network is attracting not only individuals but more organizations eager to fully exploit the learning, networking and promotional opportunities that the THA offers to its affiliates.

We hope to maintain this momentum and to see universities, research centers, innovation intermediaries, companies and government institutions joining us as organizational members, to help sustain our open access policy and share our efforts in building, disseminating, and transforming into practical achievements the Triple Helix theories and models.

Visit www.triplehelixassociation.org/wp-content/uploads/2013/08/THA-Organizational-Membership-Levels-and-benefits.pdf to review THA organizational membership levels and related benefits, and subscribe now by completing the request form at www.triplehelixassociation.org/membership-request.

Organisational Members



Royal College of Art
Postgraduate Art & Design

Royal College of Art
Kensington Gore
London SW7 2EU
UNITED KINGDOM
www.rca.ac.uk

Contact : Tatiana Schofield, Head of Knowledge Exchange
tatiana.schofield@rca.ac.uk

The Royal College of Art (RCA) is the highest ranking university in art and design in the world.

In 2015 and 2016 the QS World University Rankings placed the RCA at the top of the list in art and design globally. RCA is the most research intensive university in art and design in the UK.

In 2014 the Research Excellence Framework rated 77% of the RCA's research, and 100% of its research impact and research environment, as 'world-leading' and 'of international excellence'.

Founded in 1837, the RCA houses six Schools in Architecture, Communication, Design, Humanities, Fine Art and Material.

It is a postgraduate university educating over 1,500 graduate students from sixty countries every year.

Its twenty-four programmes span architecture and interior design, visual communication and information experience, product design, vehicle design, engineering design, service design, ceramics and glass, fashion, jewelry, textile, historical studies, critical writing, curating, painting, sculpture, photography and printing.

The RCA has a unique cross-disciplinary expertise in world-leading research and design-driven technological innovation to contribute to the global economy and address global challenges, using design-led, creative and human-centred approaches

and developing new products, technologies, services, and business models. It works across disciplines, sectors and contexts, exploring how art, design and creativity converge with engineering, social sciences and culture, public space and urban futures, material and textiles, information experience and experimental animation, new product development and organisational strategies.



50 Years – Research for
A Life Without Cancer

German Cancer Research Center (DKFZ)
Im Neuenheimer Feld 280
Baden-Württemberg 69120
GERMANY
www.dkfz.de

Contact: Professor Josef Puchta, Administrative Director
j.puchta@dkfz.de

More than 450,000 people are diagnosed with cancer each year in Germany. Cancer is a disease that poses enormous challenges, because every cancer is different and its course can vary immensely from one patient to the next. To perform research into cancer is the task of the German Cancer Research Center (Deutsches Krebsforschungszentrum, DKFZ) according to its statutes. DKFZ is the largest biomedical research institute in Germany and a member of the Helmholtz Association of National Research Centers. In over ninety divisions and research groups, more than 2700 employees of which more than 1200 are scientists, are investigating the mechanisms of cancer, identifying cancer risk factors, and trying to find strategies to prevent people from getting cancer. They are developing novel approaches to make tumor diagnosis more

precise and treatment of cancer patients more successful.

In 2008, a special distinction was the Nobel Prize in Medicine awarded to Professor Harald zur Hausen, who discovered that human papillomaviruses (HPV) cause cervical cancer. In 2014, for a second time a researcher at the DKFZ was awarded the highest distinction in science: Professor Stefan W Hell was awarded the 2014 Nobel Prize in Chemistry for his pioneering work in the field of ultra high resolution fluorescence microscopy.

Cancer Information Service (KID) staff offer information about the widespread disease of cancer for patients, their families, and the general public. The Center is funded by the German Federal

Ministry of Education and Research (90%) and the State of Baden-Württemberg (10%).

Science is a 'high-performance operation' which requires an efficiently structured research center. The scientific divisions and working groups are assigned to seven Research Programs. The core facilities support researchers in all routine tasks. The management departments report directly to the Management Board of DKFZ. The administrative departments support employees in all matters relating to human resources, finance and purchasing. The boards of DKFZ advise the Management Board on scientific, research-political and financial matters. The Alumni Association establishes networks between former and current DKFZ scientists to promote scientific exchange beyond their work at DKFZ.

Individual Members

CHRISTIAN HASLAM
Aalborg University and Technical College
Gistrup
Aalborg
DENMARK
christian.haslam@gmail.com



Christian Haslam is currently a PhD student in the Department of Communication and Psychology at Aalborg University in Denmark, where he studies student-driven innovation. In this capacity, he spends a lot of time designing and running various innovation workshops targeting students at all levels; from primary school to university, and spanning many fields of study. His work is co-financed by the Tech College Aalborg, where he has been employed for the past ten years as an educator, teaching software development in vocational programs and developing curricula at institutional, and occasionally, national level. During this time, he has developed a special interest in the Scandinavian forms of vocational training and education which is reflected in his research. Christian holds a Master's degree in Computer Science and Humanities, also from Aalborg University. Prior to becoming

interested in education he worked in the private sector for over ten years, designing and implementing software solutions for the offshore industry.

Areas of interest in TH research

Educational Innovation, Student-driven innovation, education - industry knowledge transfer, interdisciplinary educational programs.

DR IRINA PAVLOVA
National Research Tomsk
Polytechnic University
Tomsk
RUSSIA
iapav@mail.ru
(THA Chapter Russia)



Work in the area of social sciences and humanities.

Areas of interest in TH research

The entrepreneurial university, innovation systems, and university-industry interaction.

DR SARI SCHEINBERG

**Institute for Management for Innovation and Technology
Gothenburg
SWEDEN
sari@chalmers.se**

I am an American, who grew up in NY but now live and work in Sweden for the past twenty-five years. I have been developing my work for over thirty years as a Gestalt (Gestalt Institute of Cleveland, OSD program 1984), and Organisational Psychologist (Columbia University (1981), Fielding Institute (1989) working as an action researcher, developer, educator, activist and innovator. Throughout my career i have been curious about and dedicated to enhancing awareness (using action research), development (by mobilizing stakeholders) to learn and create conscious relations and ways of working (forming learning alliances) in order to create changes, improvements and innovations identified and prioritized by the alliance. I have been testing, developing and applying these models and methods of working in over fifty countries, cultures and contexts around the world. Knowledge, action research, and innovations generated are areas that include: 1) redefining the university's role in society and in innovation systems -'innovative university programs'; 2) exploring and ensuring the well-being, human rights and integration of migrants and the systems and stakeholders around them - for personal and relation development, for employment, new business development, citizenship, and for ageing with dignity; 3) designing and driving a (Master level) course 'mobilizing stakeholders for sustainable development' - using action learning, research and stakeholders in Universities to explore and develop interventions in local and regional issues, such as: university's role in society, renewable energy, environmental changes, well-being, democracy, integration and human rights, and 4) developing, testing and validating a diversity sensitive well-being model, method, and measures for assessing, understanding, improving and supporting well-being as migrants age in second homes.

Areas of interest in TH research

Action research, analysis, design, developing of models and methods for mobising stakeholders; facilitator for assessment and change for individual/team/group/organisation/society/innovation system development.

HUUB MUDDE

**Maastricht School of Management (MSM)
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THE NETHERLANDS
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Huub Mudde LM MSc is a Senior Project Consultant and Lecturer in Institutional Entrepreneurship at the Maastricht School of Management (MSM), and holds an MSc in Sociology from the Wageningen Agricultural University, The Netherlands. Currently, he is pursuing his PhD at Maastricht University on 'Entrepreneurial universities in developing countries'. He is manager of several multi-year education and research programs, and a team leader and expert in several agribusiness projects in Indonesia, Palestine, and Ethiopia, and was responsible for a national leadership and management capacity development program in Ethiopia. He is advisor and trainer on partnerships, project management, dialogue,

communication planning, vision development and fund raising for organizations working in the area of international relations. Before working for MSM, Mudde was coordinator of Euforic, Europe's Forum on International Cooperation, and worked at the Information Department of the Dutch Ministry of Foreign Affairs.

Areas of interest in TH research

Entrepreneurial universities, multi-stakeholder partnerships, leadership, emerging economies and developing countries.

ADRIANO LA VOPA

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Adriano La Vopa is a physicist with a specialisation on Earth Observation and satellite data processing. He has an international Masters degree in Nanotechnologies (and business administration), and has extensive experience in the technology transfer arena, and masters innovation management processes. He worked along with SMEs, startups and multinationals to support their innovation strategies by use of new technologies. He is an expert technology broker, a scout and a consultant, supporting companies in planning and executing their growth strategies. He has a sound knowledge of processes, tools, methods and ways to empower the hidden innovation potential of any company.

Areas of interest in TH research

Innovation in general and the connection with the business world.

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Areas of interest in TH research

Entrepreneurship, startup, and financing.

MICHELE COLETTI

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Michele Coletti is a teacher and advisor on innovation management and policy, MBA in Management Consulting, and MSc in Technology and Innovation Management.

Areas of interest in TH research

Innovation systems.

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Dr Fariba Darabi is a Senior Lecturer in International Business at Sheffield Business School, and a Fellow of the Higher Education Academy, who teaches at all university levels mainly Masters and Doctorate. Fariba as well as being an academic, has a wealth of experience of working with SMEs, and family businesses overseas. Her research interests and publications are in the field of SMEs and University Business School Collaboration, Trust in U-I Collaboration, 'SMEs Entrepreneurship and Innovation', 'Sustainability of Youth Entrepreneurs in Africa', and 'Family Businesses Sustainability and Research Methods'. She supervises doctoral students, and is actively involved with academic research bodies such as the British Academy of Management, where she is a committee member, Secretary of the Entrepreneurship Special Interest Group, and a member of Methodology SIG.

Areas of interest in TH research

SME-Business School collaboration: the role of trust.

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Anthony Buckley is Assistant Head, School of Marketing in the College of Business at the Dublin Institute of Technology. Tony holds a PhD in management from Lancaster University (UK). His research interests are in the enterprise (entrepreneurship and SME) domain, with particular emphasis on innovation and enterprise policy development and evaluation.

Areas of interest in TH research

Innovation.

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Mosi Weng is a PhD Candidate at Zhejiang University, China. He is currently a visiting student researcher at the Center for Studies in Higher Education, UC Berkeley. His research interests focus on academic entrepreneurship, and higher education management. He has a concentrated record of research and publications, his previous work on entrepreneurial transformation of universities in China, which was published in the Xinhua Digest (top journal in China), won him a National Scholarship and the Zhejiang University Annual Top Ten Students' Academic Achievement Award.

Areas of interest in TH research

Entrepreneurial University.

PROFESSOR EVGENI EVGENIEV

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Associate Professor Evgeni Evgeniev, PhD Vice-Rector for European Projects and Further Education, VUZF University of Finance, Business and Entrepreneurship, Sofia, Bulgaria, is one of the authors of Bulgaria's Smart Specialization Strategy (3S) and Sofia's 3S. He is actively collaborating with the Ministry of Education and Science as a Member of the Working Group to develop the National Research Strategy 2025, and with the Sofia Tech Park JSC as a Member of the Scientific Expert Committee. Dr Evgeniev is also a Member of the Monitoring Committee for the Sofia 3S under the Mayor of Sofia Municipality. As a former Private Sector Development Specialist at the Europe and Central Asia Region of the World Bank (2007-2015), he authored reports and provided advisory support in the area of innovation, business regulation, and access to finance in countries, like Bulgaria, Croatia, Czech Republic, Kazakhstan and Poland, among others. He teaches courses in Global Strategic Management, Innovation and Entrepreneurship, Public Policies and Business Regulation, and International Financial Organizations. He served as visiting lecturer in 2003 and 2006 at the Central European University (Budapest), and at the Korean Development Institute School of Public Policy and Management (Seoul) in Fall 2014. Dr Evgeniev has authored over thirty scientific publications in refereed journals and published three books. His recent academic research has focused on innovation, entrepreneurship, and technological commercialization.

Areas of interest in TH research

Innovation, entrepreneurship, technological commercialization, and knowledge triangle collaboration.

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Professor and researcher.

Areas of interest in TH research

Mathematics and statistics.

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I obtained my BA (Hon) in Economics and Political Science from McMaster University, and my Master of Public Policy (MPP) from the University of Saskatchewan, specializing in Innovation Policy. I am currently pursuing PhD in comparative public policy at McMaster University. My research focus is on innovation parks and centers of excellence in Canada, Australia and the UK.

Areas of interest in TH research

Innovation parks, university-industry linkages, networks, commercialization, superclusters, organizational decision making, and comparative innovation policy

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University of Massachusetts Boston, PhD in Public Policy, and from September 2014 to present Northwestern University, MS in Project Management from January 2012 to June 2013 University of Science and Technology, Beijing, BS in Economics from September 2007 to June 2011.

Areas of interest in TH research

Innovation and Bayh-Dole Act.

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Dr Tonny K Omwansa holds a PhD in Information Systems and is a faculty member at the School of Computing and Informatics, University of Nairobi. He is the co-author of the book 'Money, Real Quick: Kenya's disruptive mobile money innovation'. Besides teaching, he coordinates the innovation activities at the University of Nairobi, including running a technology accelerator program, managing the annual Nairobi Innovation Week, and designing innovation courses. He is the Director of the C4DLab, the innovation and incubation lab of the University of Nairobi. Dr Omwansa has conducted extensive research and consulting work on ICT, Innovation, financial inclusion, mobile transactions and information systems in various countries resulting in numerous products, publications and reports.

Areas of interest in TH research

Design, adoption, and impact of innovative low-cost appropriate technologies in developing countries.

PROFESSOR SIMONE ALENCAR
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Chemical Engineer MSc, Information Science Dr Technology of Chemical and biochemical processes

Areas of interest in TH research

Entrepreneur university.

To become a member of the Triple Helix Association, please complete the membership form at
www.triplehelixassociation.org/membership-request

THA NEWS

THA launch First Summit in Cooperation with I Choose Life - Africa

We are pleased to announce that during the XIV International Triple Helix Conference in Heidelberg, Germany, Professor Henry Etzkowitz, the THA President, (left) and Mike Mutungi, CEO of I Choose Life - Africa, (right) signed an agreement to host the forthcoming Triple Helix International Summit in Kenya, in Nairobi, Kenya on 4-6 April 2017.

The Summit theme is the *Role of the Quadra Helix in accelerating the achievement of vision 2030 and SDG's in Health, Education, Governance, Technology, Digital Literacy Green Energy and Curriculum Reforms*”.

Should you wish to submit a paper to the Summit, details are given on page four.



THA Election and Call for Candidatures

Application Deadline : 1 July 2017

The Triple Helix Association announces that there will be an election for Executive Board Members at the end of 2017.

We are looking for active professionals, either academic, practitioner or civil servant, with good external connections and with the power to influence others' decisions and/or with an interest for TH dynamics and debate, willing to take over THA specific operational tasks.

To submit your application to participate in the Election, please send a one-page word document containing 800-1000 words to include:

- a short bio and photograph, previous academic/professional experience and achievements
- a proposal detailing what you intend to do to support the THA in relation to new activities, projects, networking, promotion and membership recruitment.

to the THA Executive Director, Mrs Maria Laura Fornaci
mlaura.fornaci@triplehelixassociation.org

Preliminary Outcomes of the GEUM Research Project

Grassroots Student-Led Entrepreneurial University Ranking in Brazil

Brasil Junior, RedeCsF (Sciences without Borders Alumni Network), Brasa, AIESEC, and Enactus, came together in order to produce a bottom-up, grassroots piece of research to reflect the student perspective on entrepreneurial universities, and bring the agenda to national attention.

Unlike most other existent rankings which are usually composed and selected either by commercial ranking agencies or an academic board, this ranking sought to reflect the student perspective and demands. The study has been recently accomplished by Justin Hugo Axel-Berg, Daniel Neves Pimentel, and Guilherme Rosso under the GEUM initiative.

Background

The ranking group was inspired by the emergent tendency in global higher education towards entrepreneurial universities that produce knowledge in the context of application, and seek to contribute to the

construction of knowledge societies and economies. The issue has received much specialist and international attention in Brazil, and competences are growing rapidly. The topic has yet to receive mass exposure and attention and, therefore, has limited political clout as a concept.

Methodology

The research took the form of two phases, one as a qualitative opinion survey of respondents to discover student perception of what an entrepreneurial university is, from which 4255 responses were elicited. These results were then used to inform metric choice in the second phase; the construction of the ranking itself. This phase utilized student ambassadors in each university to gather information, combining them with publicly available data from the ministry of education and the commercial domestic ranking Folha de Sao Paulo ranking. This second phase had upwards of 6000 respondents.

Metric Composition

Students were encouraged to respond to the first section via a multiple choice questionnaire as to their opinions on the most important characteristics of an entrepreneurial university, and a semi-structured section in which they were encouraged to write upto 500 characters on what an entrepreneurial university is. Textual analysis techniques were applied to the 4255 responses from this stage, and a guiding tripartite definition was used to inform the composition of stage two.

“An entrepreneurial university is an academic community, inserted into a favourable ecosystem, capable of developing a society through innovative practices”,

From this, the metrics were divided as illustrated below.

Results

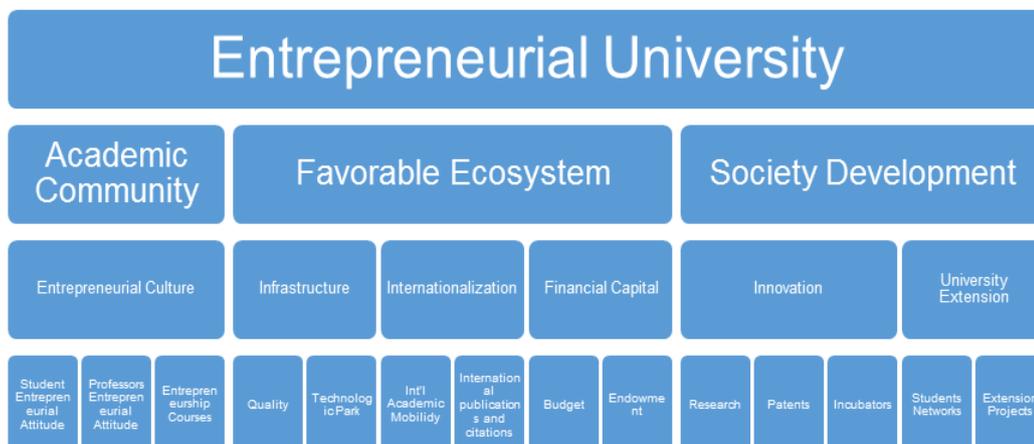
The results were published on 8 November 2016 at www.brasiljunior.org.br.

Conclusion

The problems of constructing a ranking, especially for something with multivalent results like an entrepreneurial university are well documented. The potential power of rankings, however, lies in their ability to gain wider attention and to serve as drivers to mobilise public opinion and pressure for change. This ranking has attracted much press and attention outside of academia, and generated internal dialogue.

For any ranking to be useful, it must seek to represent as broad a range of information about the included universities as possible. Because many universities in Brazil have relatively limited capabilities, metrics are geared relatively low by global standards. As such, this ranking shows which universities in Brazil are best positioned to become entrepreneurial universities, and which have the most entrepreneurial stance.

Future iterations will seek to include more output and impact-based measures, as universities begin to respond to the increased articulation of student demand.



New Fellowship at Stanford Graduate School of Business

A new Fellowship opportunity at Stanford Graduate School of Business, one of the top ranked business schools, will cover tuition and fees for MBA students, but the program comes with a catch: students must be willing to take a job in the Midwest.

Students often select California-based Stanford because they know they'll get a great education and make contacts in Silicon Valley, where many of them presumably want to work after graduation, but the School has plans to funnel students to more 'underserved regions' where the economy could benefit from an infusion of talent.

In its inaugural year, the Stanford USA MBA Fellowship will pay three students \$160,000 over two years to attend the university. Within two years of graduating, recipients are required to find work in the Midwest, where they will 'contribute to the region's economic development' for at least two years.

To qualify, applicants must demonstrate financial need and have strong ties to the Midwest, which may include current or prior residency, or graduation from a high school in the region.

An online summary of costs associated with attending the School of Business puts tuition and fees over \$111,000 per academic year for individuals living off-campus, so the Fellowship's financial award might not suit low-income students.

The Midwest - which the fellowship defines as Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin - might not seem like the hotbed of innovation that Silicon Valley is, but living in the 'Silicon Prairie' has its benefits, including competitive salaries and often a low cost of living, and the tech boom echoes across the country. Michigan and Illinois were among the five states that added the greatest percentage of tech jobs in the first six months of the year, according to an analysis of US Bureau of Labor Statistics by the research firm Dice.

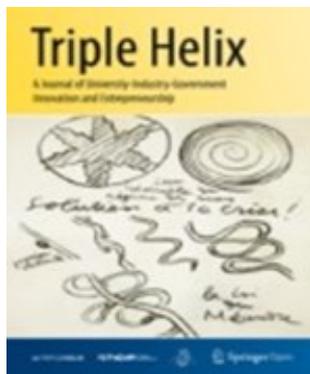
The First African Journal of Science, Technology, Innovation and Development (AJSTID)

According to Professor Mammo Muchie, Co-Chief Editor of AJSTID, and the DST-NRF South African Research Chair in Innovation Studies, the journal will provide an important outlet for research on process as well as the impact of science, technology, and innovation at two levels. It will specifically cover and address the objective of achieving industrial growth, together with the successful achievement of broader socio-economic development, particularly in Africa and other developing economies.

The other Co-Chief Editor of the Journal, Dr Angathevar Baskaran, is from the Department of Development Studies, Faculty of Economics and Administration at the University of Malaya, Kuala Lumpur in Malaysia. Associate Editors include highly acclaimed academics from various institutions across the world.

AJSTID is listed with the Emerging Sources Citation Index (ESCI), SCOPUS, the International Bibliography of the Social Sciences (IBSS), the Department of Higher Education and Training, and in other citations such as EBSCO.

PUBLICATION OPPORTUNITIES



Triple Helix: A Journal of University-Industry-Government Innovation and Entrepreneurship (Springer)

www.triplehelixjournal.springeropen.com/articles

SPECIAL ISSUE ON INDIVIDUALS IN THE TRIPLE HELIX

Guest Editors: *Rhiannon Pugh*, Uppsala University
Yuzhuo Cai, Tampere University

Paper Submission Deadline : 1 January 2017

The Triple Helix thesis posits that for innovation and economic development outcomes at the local, regional, and national scale, universities, industry and government need to work together and form strong partnerships and co-operation. Evidence is cited of regions, institutions, and indeed nations that have successfully harnessed the power of the Triple Helix to bring about economic growth in the knowledge economy, the most commonly cited examples being the global exemplar regions such as Silicon Valley, Route 128, and Cambridge UK. This is partnered by in-depth studies of particular programmes or interventions, or institutions that have successfully engaged in this sphere of activity.

However, whilst Triple Helix relationships and spaces are commonly discussed and heralded as the key to economic success, there is little actual investigation of what these interactions look like at the individual level, and what the reality of implementing the Triple Helix actually looks like 'on the ground'.

There is relatively little work in opening up the black box of the Triple Helix to examine the relationships and experiences therein. This Special Issue attempts to redress that balance, to uncover the experience of those working at the coalface of the Triple Helix trying to manage those relationships and ensure productive outcomes. It aims to link up different levels of analysis but shine a light

on an often-overlooked area of study into individual engagement in Triple Helix activities.

Contributions from a range of fields and perspectives are welcomed, which illuminate the role of individuals within the Triple Helix. More specifically, we would be particularly keen to explore - albeit not exclusively - the following topics:

- What theoretical/conceptual frameworks can help better understanding individual engagement in Triple Helix activities?
- Who are the key individual actors engaged in the Triple Helix interactions and what are their major activities?
- How could the analysis of Triple Helix activities at the individual level and studies at the policy and organisational levels supplement each other?
- How to design the policy and organizational structures to facilitate the individuals' involvement and engagement in Triple Helix activities?
- What are the roles of students in their contribution to innovation from the perspective of Triple Helix model?
- What challenges confronted by academics when engaging in university-industry collaboration activities?
- What are the conflicting norms and cultures for individuals engaging in Triple Helix activities?

We welcome submissions on these topics, or indeed other interesting dimensions of participation in the Triple Helix from international colleagues.

Please submit full papers by 1 January 2017 via the journal submission page. Information and instructions can be found at:

<http://triplehelixjournal.springeropen.com/submission-guidelines>.

Please contact the guest editors at the emails provided if you require further information or would like to discuss the suitability of a potential contribution:

Rhiannon.Pugh@kultgeog.uu.se
Yuzhuo.Cai@staff.uta.fi



**Journal of Management
Dynamics in the Knowledge
Economy**
(SNSPA, Faculty of Management)

**SPECIAL ISSUE ON MANAGING THE TRIPLE HELIX
(DECEMBER 2016)**

Guest Editors: **Dr Emanuela Todeva**, Research Centre for Business Clusters, Networks and Economic Development (BCNED), UK
Professor Panayiotis Ketikidis, Vice Principal - Research, Innovation and External Relations, University of Sheffield International Faculty, CITY College

**Paper Submission Deadline
19 December 2016**

We are seeking academic contributions that articulate the issues of managing complex multi-stakeholder projects and managing specific channels for Triple Helix engagement such as knowledge transfer, science parks, or university-industry collaborations, among others. Revealing the management, governance, coordination and orchestration issues and providing critical theoretical discussion or empirical observations will extend the scope of the current knowledge and practice.

Papers are expected to address more closely management, governance, or cohe Official Quarterly Magazine of the Triple Helix Association

www.triplehelixassociation.org/helice

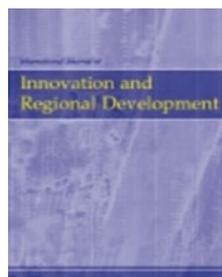
ordination issues, linking the Triple Helix theory with the practice. Papers that address issues of broad societal challenges or narrow innovation cases with Triple Helix solutions are welcome. The management/coordination dimension can be brought either with a focus on the Triple Helix inputs or outputs.

TRIPLEHELIX
UNIVERSITY INDUSTRY GOVERNMENT association

THA Helice Magazine

The Official Quarterly Magazine of the Triple Helix Association
www.triplehelixassociation.org/helice

There is an open call for practitioner cases, scientific news and professional statements in all areas of Triple Helix research, including Quadruple Helix, n-tuple Helix and multi-stakeholder engagement, university-industry-government interactions, national and regional innovation systems, knowledge transfer, entrepreneurial universities and enterprising governments, or university-industry partnerships and co-creation.



**International Journal of
Innovation and Regional
Development**
(Inderscience Publishers)

**SPECIAL ISSUE ON REGIONAL TRIPLE HELIX FOR
ACCELERATED DEVELOPMENT**

Guest Editors: **Dr Emanuela Todeva**, Research Centre for Business Clusters, Networks and Economic Development (BCNED), UK
Professor Mike Danson, Heriot-Watt University, UK

**Paper Submission Deadline
05 January 2017**

We are seeking academic contributions that articulate the issues of Regional Triple Helix constellations and activities, or regional initiatives across the government-university-industry space.

We invite both theoretical and empirical contributions that address the complex issues of regional stakeholders, and innovation practices, science parks, incubators or clusters that drive accelerated knowledge transfer practices with broad societal impact.

The research questions may address either the inputs or the outputs from Triple Helix engagement, or indeed can focus on critical discussion and evaluation of practices and outcomes from regional Triple Helix platforms. Papers that address issues of broad societal challenges or narrow innovation cases and regional Triple Helix solutions are welcome.

www.inderscience.com/jhome.php?jcode=ijird

Guidelines for authors and sample papers, as well as information about the refereeing process and other relevant journals, are available on our website: www.inderscience.com/guidelines.



Industry and Higher Education
(Sage)
www.uk.sagepub.com/en-gb/eur/industry-and-higher-education/journal202558

Open Call for Submissions