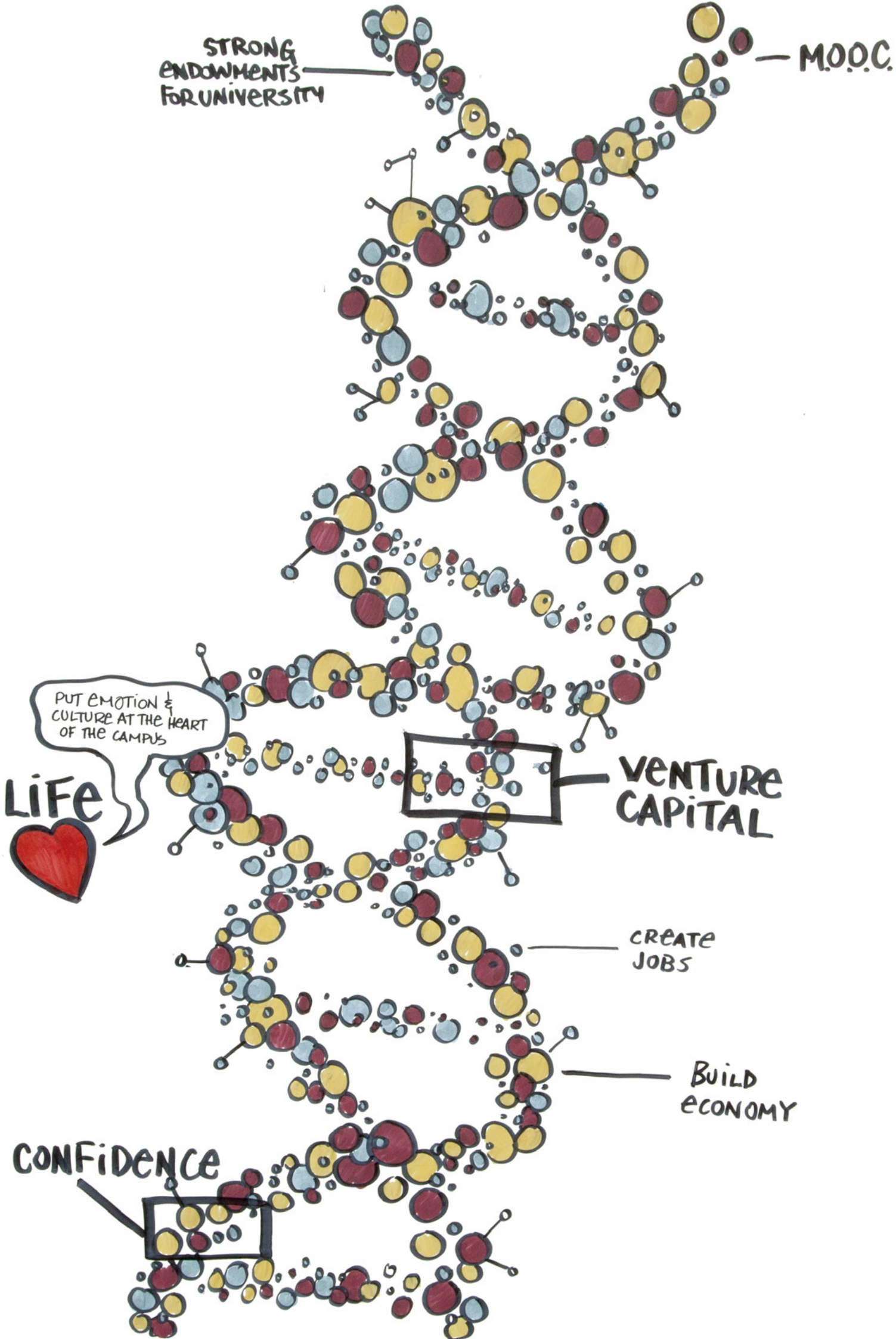
GIANT | HIGH LEVEL FORUM

Leading Innovation Ecosystems

Executive Summary


STRONG ENDOWMENTS FOR UNIVERSITY
M.O.O.C.
PUT EMOTION & CULTURE AT THE HEART OF THE CAMPUS
LIFE
VENTURE CAPITAL
CREATE JOBS
BUILD ECONOMY
CONFIDENCE

WELCOME

The first edition of the High Level Forum in Grenoble was the result of a study of innovation ecosystems made on the initiative of Jean Therme, Director of CEA-Tech, Founder of MINATEC and GIANT.

The objective of this Forum was to allow us to share our visions of the large-scale innovation ecosystems which we represent. Our work here was fruitful and gave us ample reason to meet again next year for a second edition.

We hope this report will give you a good overview of the topics we discussed and of the key takeaways we shared.

Marcel MORABITO
Senior Advisor for CEA-Tech, Professor at the Institut d'etudes politiques of Paris, France

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Geneviève FIORASO
Minister of Higher Education and Research, France

Dear Chairmen,
Dear Professors and Directors,
Dear Colleagues and Friends,

It's a pleasure for me to open the High Level Forum held here within the GIANT Campus in Grenoble. It's a unique event that for two days gathers key actors from famous innovation centres.

It's really an honour to have this international Forum centred on open innovation with debates on "innovation eco-systems", "success criteria for world leading ecosystems", "self-sustaining industrial landscapes" and "balancing of research – development-innovation portfolios" here in Grenoble.

1. Open Innovation means Ecosystems
Grenoble is a typical example of the French way to create an efficient innovation ecosystem.
The GIANT campus illustrates what could be done to stimulate interaction between researchers, out-of-the-box thinking and cross links between academia and industries…it's what is called "Open Innovation".
This ecosystem is not an artificial island; it's really a cultural heritage of more than a century of continuous development, conducted by scientists and political leaders having contributed to create such an environment.

Addressing industrial and societal challenges requires systemic, multidisciplinary and human-centered approaches.

I want to promote high-level education, world class basic research, intensive technological research and up-to-date technological platforms closely developed with industry. We can find this alchemy here in

Grenoble.

We need to stimulate, in different regions, local initiatives to improve networking and create an innovation continuum from basic sciences to industrial enterprises.

Open Innovation also means to have a very close link with society and I would like to see more cross-thinking processes between researchers, artists and citizens through Living Labs or similar open mediation platforms.

I visited here on this site a “powerful tool” called the “IdeasLab”, dedicated to Science and Society, an original lab for open innovation! Thank you Michel Ida, Philippe Mallein and all the IdeasLab team for having been pioneers and so creative.

2. Today growth means Innovation

Improving the economic impact of R&D is a key concern for France, especially in coherence with its new national policy on promoting growth. Today, in advanced countries, there is no way to stimulate growth without a strong innovation policy.
Our Prime Minister, Jean-Marc Ayrault said during his general policy talk in Parliament last Tuesday: “We have strong assets. I want to give a competitive edge to France in the field of new technologies, to create national and European champions.”
This will define the priorities of the French Research, Technology and Innovation policy I am conducting. This policy should be deeply renewed in the forthcoming months in order to foster growth and employment.

The French innovation landscape is structured by the French competitiveness clusters: more than 70, including 15 world-class clusters in key strategic fields such as Aerospace, Healthcare and Biosciences, IT, Nanotechnologies. In Grenoble, the Minalogic Cluster is dedicated to Micro and Nano Technologies.

World-leading companies, innovative SMEs and public research organizations are involved in these clusters. After two 4-year phases, the French government is currently investigating a third phase in order to switch from R&D concerns to economic growth concerns.

Such innovative ecosystems play a key role for sustaining research and innovation: about 2.7 B€ have been funded - State and regional - for the period 2008-2011.

In the field of technology transfer policy, France is going to create about 12 TTOs -Technology Transfer Offices - to reinforce transfers from academic research, especially in Universities. In the coming year, the regional and national transfer system should be deeply modified. I want it to be simpler, more efficient, focused on economic results, focused on innovative SMEs, focused on market end-users, and free of the technocratic complexity so repelling for SMEs.

Innovation is strongly related to innovative SMEs and France is going to implement many appropriate tools in favour of SMEs to foster partnerships between academia and SMEs.

Entrepreneurship is a key element. In the last few decades, about 1,400 high-tech start-up companies - about 60% among them are stemming from public research - have been distinguished in France.

Seed money can be found while the key concern is now related to the funding of the later stages of the start-up developments: how to switch from “start” to “up” and become, per chance, a medium company, able to create and added value jobs through innovation, exports, European and international development.

3.Think Global Act Local

European initiatives should be investigated in order to foster the so-called hyper-growth fields such as Biotech, IT or Nanotechnologies with a special focus on “industry”.

The European policy should then be comprehensively renewed in the forthcoming years in order to stimulate “Innovation for growth” and “Technology for growth”!

The keystone of this policy will be the technology and what we now call KETs: Key Enabling Technologies.

The Europe 2020 strategy clearly pointed out the importance of industrial competitiveness for growth and jobs as well as for Europe's ability to address grand societal challenges in the coming years. Mastering and deploying Key Enabling Technologies (KETs) in the European Union is central to strengthening Europe's capacity for industrial innovation and the development of new products and services needed to deliver smart, sustainable and inclusive European growth.

In the KETs domain, the EU is now facing growing competition from both developed and emerging economies in particular in North America and East Asia.

Although the EU remains resilient, in a position of relative strength, it must now reinforce and rapidly develop its KET industries to compete for the future.

The KETs High-Level Expert Group, (Jean Therme is the chairman) has identified the major difficulties Europe has in translating its ideas into marketable products – in crossing the internationally recognised "valley of death".

To cross this valley, it recommends a strategy comprising three pillars:

- A pillar focused on technological research
- A product demonstration pillar focused on product development
- A production pillar focused on world-class, advanced manufacturing.

I have discussed these topics with my European colleagues in Brussels within the frame of a competitiveness group and with my G8 colleagues in Constance during a week-end seminar. We share the same roadmap.

4. Conclusion

In conclusion, to address grand societal challenges in the coming years, particularly population growth, energy transition and climate change, it seems to me essential to mobilize all the actors of the innovation chain, to focus on "human-centred innovation" and to contribute to building a more friendly world.

The innovation policy I summarized in my talk is mandatory to stimulate growth and jobs and provide a better future for our citizens.

To conclude, I wish you a very productive Forum and have nice stay here in Grenoble. Don't forget to visit our Museum of arts and to climb our mountains!

Thank you very much for your attention.

INNOVATION ECOSYSTEMS: CURRENT MODELS AND GOVERNANCE

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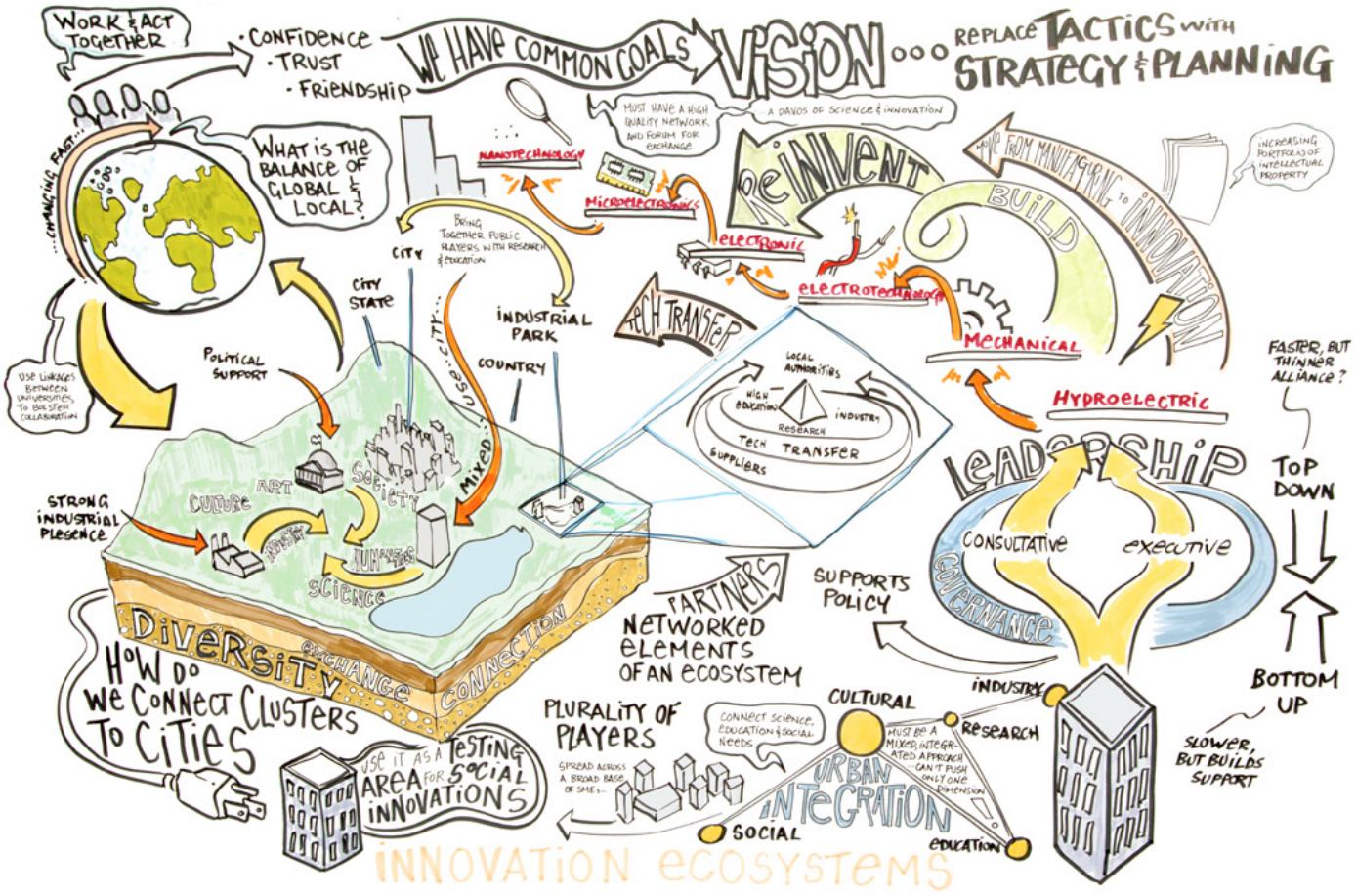

Jean THERME
Director, CEA-Tech, Founder of Minatec & GIANT, France

Conceptions of innovation are moving from a linear model to a collaborative self-organizing model. In an innovation ecosystem, multidisciplinary, self-organizing relationships, open innovation, access to talent and customer centricity are critical.

The diversity of observed models results from history, scope of activities and territories. There is a true diversity in the way Innovation Ecosystems are conceived, designed and operated around the world. An innovation ecosystem can refer to a science and industrial park, as shown by the Hsinchu science and industrial park in Taïwan; a city, like the “Innovation District” in Montreal; a city-state, with the Singapore example; a regional network, like the Dresden region in Germany; a nation, like the Brazilian example.

Key results from our benchmark in 20 countries over the last 5 years.

1.- Governance is about the leadership structure running the innovation ecosystem, its degree of maturity, how it is connected to the State and local authorities, how it maintains and leverages an international network of partners. We have identified 3 types of drivers: a strong industrial presence, a strong political commitment, the academic configuration between Research and Education.

The academic dynamics between Research and Education can shape various situations from research prevalence , through strong combination between education and research, to osmosis or complete fusion.

2.- Innovation Ecosytems share common architecture design features. Firstly, the well balanced casting of the various stakeholders:

a.) The core group, made up of organizations representing research, high education and industry. Their collaborations are the trigger for innovation.
b.) The Technology transfer organizations, allowing the core group members to optimize their links and improve the flow of their relations.
c.) The Peripheral actors: financial partners, suppliers and clients.

Secondly, an environment that facilitates and supports the emergence of innovative ideas and projects: regulation, infrastructure and quality of life.

Thirdly, an overall dynamic allowing a constant movement between stakeholders.

3.-All the ecosystems studied demonstrate a commonality of shared objectives:

- Bringing together political authorities, research, higher education organizations and industry. Supporting SMEs is core to most strategies.
- Attracting external talents and promoting the development and renewal of competences.
- Connecting fundamental and applied research, and more specifically, by regrouping technological research and major scientific facilities.
- Focusing on priority domains with strong societal impact and leveraging Information Technologies, Biotechnologies and Alternative Energy.
- Combining science and urban development by placing science at the core of the city and generating concrete projects where science and technology become stakeholders, or even, catalysts, for major urban renewal projects.
- Developing a site architecture that supports the integration and connection of the various actors.

Learnings from Grenoble Innovation Ecosystem

1.- The Grenoble ecosystem: a continuing renewal from technological industries. From 1869, Aristide Bergès's discovery of hydroelectric power to today's GIANT ecosystem, Grenoble has been a fertile ground for innovation. Successive clusters of strong technological fields (hydropower, mechanics, electromecanics, electronics,..) generated powerful industries and champions (Alstom, Schneider Electrics, Thales, ST microelectronics), which in turn supported the development of new waves of research, development and successful industrialization. Reinvention is key!

2.- Our governance is therefore marked by its flexibility and autonomy. We followed two complementary options: a strong anchorage in the local dynamics and a focus on action rather than structure. Most importantly, our approach is based on the principle of proximity (for speed and efficiency) and the conviction that ***"governance is nothing but a tool serving a policy"***.

Three questions to launch the panel discussion:

1.- Which principle of action shall drive our innovation ecosystems?
2.- How do we ensure the sustainability of our innovation ecosystems?
3.-How do we set a continuing balance between local and global, both at a regional level and at an international level ?

Group Discussion: Key Points

#1 An assessment of current governance models reveals a large diversity due to each country's own history, political and economical environments. Each situation is different and needs to have specific challenges addressed. Nevertheless, some countries also share common ground or look for the same kind of development showing similar patterns. Best practices can be identified and spread among the community.

#2 Innovation initiatives are of two kinds: Top Down and Bottom Up. Top down models are driven by government strategies and supported by national or regional policies. Bottom up models, where institutions push for new innovation ecosystems, need to engage and convince local, regional authorities, sometimes even to calling for changes in legal frameworks. In the end governance is nothing but a tool serving a policy and will be shaped according to the purpose and vision it serves.

#3 By their budget, their ambition and their impact on the society, campus projects are not only taking major roles in the economic development of their countries but are also transforming urban districts. They are taking on new social responsibilities and leveraging new ecosystems to foster innovation.

#4 Many institutions would like to boost even more the small and medium enterprises to foster innovation. Taking more risk, SMEs can take worldwide leading roles faster and at the same time have less impact on society in case of failure. However, the current partnership models are not yet fully adapted; the size, structure, incentives and resources of large companies make them far easier to partner with. Institutions still need to adjust their collaboration models in order to more effectively interface with this highly dynamic and productive segment of the economy.

#5 Success is the result of the right mix of science, society and technology. Considering today's crises and ups and downs, society is no longer only waiting for answers from science and technology, but takes an active role in developing the innovations needed. Collaboration with culture and arts is strengthened. New environments are built for people to work better together enriching one another with different backgrounds and perspectives, combining social necessity and creativity.

“We want industries to migrate to innovation. ”

Gou-Chung CHI, Chair Professor, University System of Taiwan, former President of National Science Council, Taiwan

“Innovation has emerged as key component of government strategy at all levels to ensure the future of economy and the prosperity of our citizens.”

Yves BEAUCHAMP, Director, Quartier de l’innovation, Canada

“We need to distinguish between governance and leadership. It depends at what moment we are looking. At the beginning you need more of two kinds of leadership: an incarnation and a system of leadership.”

Thierry GRANGE, President, Grenoble Ecole de Management, France

“Governance goes far beyond the organization and decision making processes; it’s about the leadership running the innovation ecosystem, its degree of maturity, how it is connected to the state and the local authorities, and how it maintains and leverages partnerships.”

Jean THERME, Director of CEA-Tech, Founder of MINATEC and GIANT, France

“The idea is to create more SMEs which can be world leaders very quickly.”

Horst HIPPLER, President, Karlsruhe Institute of Technology, Germany

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SUCCESS CRITERIA FOR WORLD-LEADING INNOVATION ECOSYSTEMS

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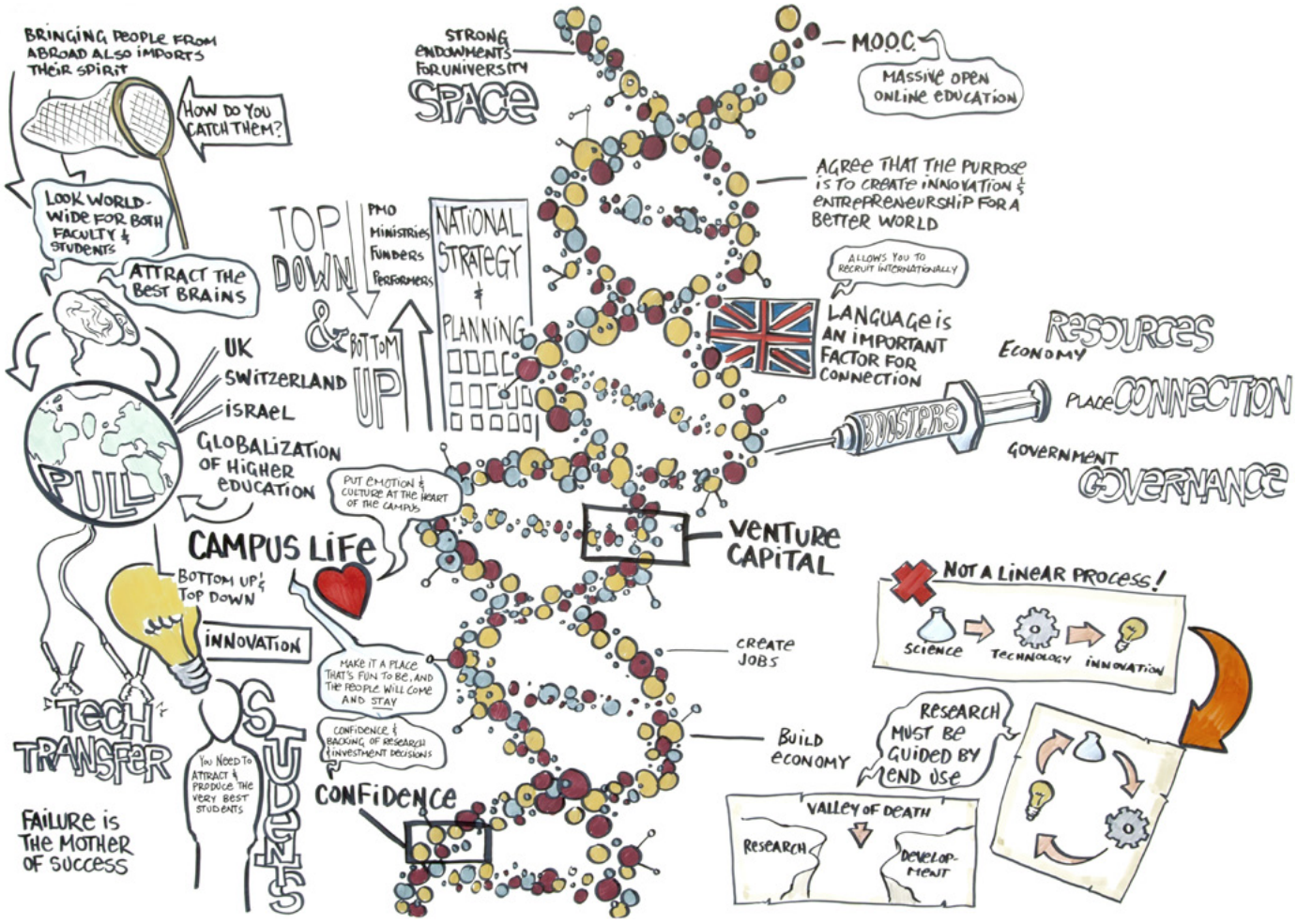


Patrick AEBISCHER
President, Ecole Polytechnique Fédérale de Lausanne, Switzerland

The globalization of higher education is changing the environment in which Innovation ecosystems operate.

The emerging global landscape is characterized by :

- Significant Asian investment in tertiary education (China, India, etc.)
- US and European Universities under financial constraints
- New comers (KAUST, MIST, etc.)
- The development of off-shore campuses (eg .Singapore: INSEAD, Yale, MIT, ETH. Gulf region: Science City in Doha, Abu-Dhabi, etc.)

In this global context, there is a a worldwide competition for the best brains. The development of global rankings of Universities (Shanghai Jiao Tong, FT, QS world university ranking) has introduced a common set of metrics for performance and excellence assessment, but continental European universities do not rank well against these metrics. The root causes for this performance gap are: national fragmentation, separation of research from education (CNRS, Max Planck etc.), a multiplicity of teaching languages, lack of a true merit-based system and insufficient funding. The main factor for success is a close link between research and education. Innovation relies on excellence in both research and education.

The 8 elements that will drive success:

1. Attract and retain the best faculty. “Elite revolutionary science should (…) be a place that welcomes brilliant, impulsive, inspired, antisocial oddballs – so long as they are also dedicated truth-seekers” - Bruce G. Charlton, Medical Hypotheses 72, 2009
2. Recruit the best students from all over the world (eg In EPFL 50 % of students and 75% of PHDs are from abroad)
3. Promote “coopetition” (cooperation + competition)
4. Develop a merit-based system and reward success
5. Reinforce technology transfer
6. Obtain adequate funding (state & private), and diversify
7. Develop strong, recognizable brands
8. Build bridges between the various world cultures

Learning from the EPFL journey

EPFL is a young institution created in 1969. A transformation was engaged during the 2000 – 2010 decade to transform EPFL, from a good engineering school into a world-class technological research University.

The vision was to increase the critical mass (both students and Faculty), broaden the scientific perimeter (natural sciences, life sciences, management, finance), stimulate transfer, improve the research output by increasing the number and quality of Faculty, create a lively campus (i.e. a culture and an environment conducive to innovation) and adapt the governance.

EPFL Today in Brief

The key campus figures are 8,442 Students including PhD students, 355 Faculty and 2,692 Staff. The EPFL budget for 2011 amounts to 440 million Euros from the Swiss Confederation and 170 million Euros from external funding. The mission statement recognizes EPFL’s responsibility towards Society:

- Educate and train future scientists, engineers and architects
- Conduct cutting-edge research
- Transfer knowledge to create jobs and companies

EPFL promotes transdisciplinarity through disruptive initiatives (alinghi, solar impulse, hydroptère and the Swiss Cube) and participation in FET flagship programmes (Human Brain Project, Guardian Angel). The new vibrant heart of the campus, the Rolex Learning Center designed by Sanaa (Pritzker Award 2010) is now open and busy 7 days a week: which is no small feat for Switzerland!

A set of winning principles to launch the panel discussion:
Be creative, be ambitious, be bold !
Be inspired !
Make it simple !
Never forget the Chinese proverb : “failure is the mother of success”.

Group Discussion: Key Points

#1 There is no universal model for innovation ecosystems. However, there's a menu of success factors that any ecosystem is composed of.

#2 There are basic ingredients in the form of education and research. The crucial interplay between these two is at the center of a successful model; they cannot operate effectively independent of one another.

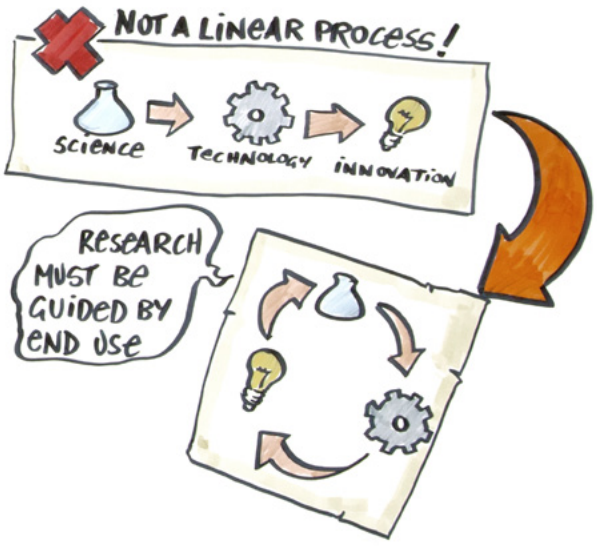
#3 The outcome of the innovation ecosystem enterprise centers around the development of innovation and entrepreneurship for a better world.

#4 There are three main boosters of innovation ecosystems: resources provided by a growing economy; governance and a measure of leadership, usually from Government; and a place which facilitates the connection of people and ideas. There will always be a need for educated people to understand the world and for researchers to push knowledge further. In this respect, there's an advantage to native English speakers – science's 'lingua franca'- that fosters their visibility and mobility.

#5 The accumulation of confidence over time is key to nurturing the innovation process; ensuring that there is continuity to efforts backing up the priorities and investments made in innovation. Further, the attraction of venture and other private capital is critical to bring ideas to market and share risk.

#6 Digital practices are changing the ecosystem landscape. MOOCs (Massive Open Online Course) are an example of the way that digital forums are changing the way people connect and collaborate. Education is now being delivered in a distributed manner; a development that will have an enormous impact on how innovation works. Nonetheless, physical location will remain essential and will likely become even more important, as serendipitous connections are essential to the DNA of innovation (the 'cafeteria effect'). These factors increase the importance of "place", and will favour areas that offer an attractive experience and high quality of life to communities involved in the ecosystem.

#7 The case of Brazil illustrates how an innovation model must adapt. For the country's leadership, priorities have traditionally been about economic growth, job creation and poverty reduction. But as the country evolved towards a new set of priorities, its innovation concept needed to change to ensure its development remained on a sustainable trajectory. What was a linear view became a circular dynamic, where innovation is no longer an end point but rather informs new priorities, including the role of science in society; connecting end users to research. At the core of this innovation revolution lies a deep transformation of how we learn, teach and produce knowledge, and how we measure ourselves.



“A place is about connection, it is where things happen. There have been attempts to create ecosystems from scratch, but you can’t do that. That’s good for real estate, but not for innovation and entrepreneurship.”

Thierry GRANGE, President, Grenoble Ecole de Management, France

‘R&D is a survival strategy of Singapore. It’s about moving into a knowledge economy.’

George LOH, Director, Strategy & Policy, National Research Foundaton, Singapore

‘The way we produce knowledge is changing very fast. There are new ways to teach, to learn and to measure ourselves. We must ask what kind of education we want to put in place in such a context.’

Ronaldo MOTA, Visiting Fellow University of London, former Secretary for Technological Development and Innovation, Brazil

“One of the great advantages that the US has is mobility of its people. In Japan, we have a language problem. We have to adapt to the English-dominated world. To participate and to compete, language is very important.”

Sukekatsu USHIODA, President, NIMS, Japan

“The ‘cafeteria effect’ is important. We’ve opened the library on Saturday and Sunday from 7 to 10pm, and that had a big impact. Suddenly people had a place to go and they stuck around.”

Patrick AEBISCHER, President, Ecole Polytechnique Fédérale de Lausanne, Switzerland

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PREPARING THE FUTURE: SELF-SUSTAINING INDUSTRIAL LANDSCAPES

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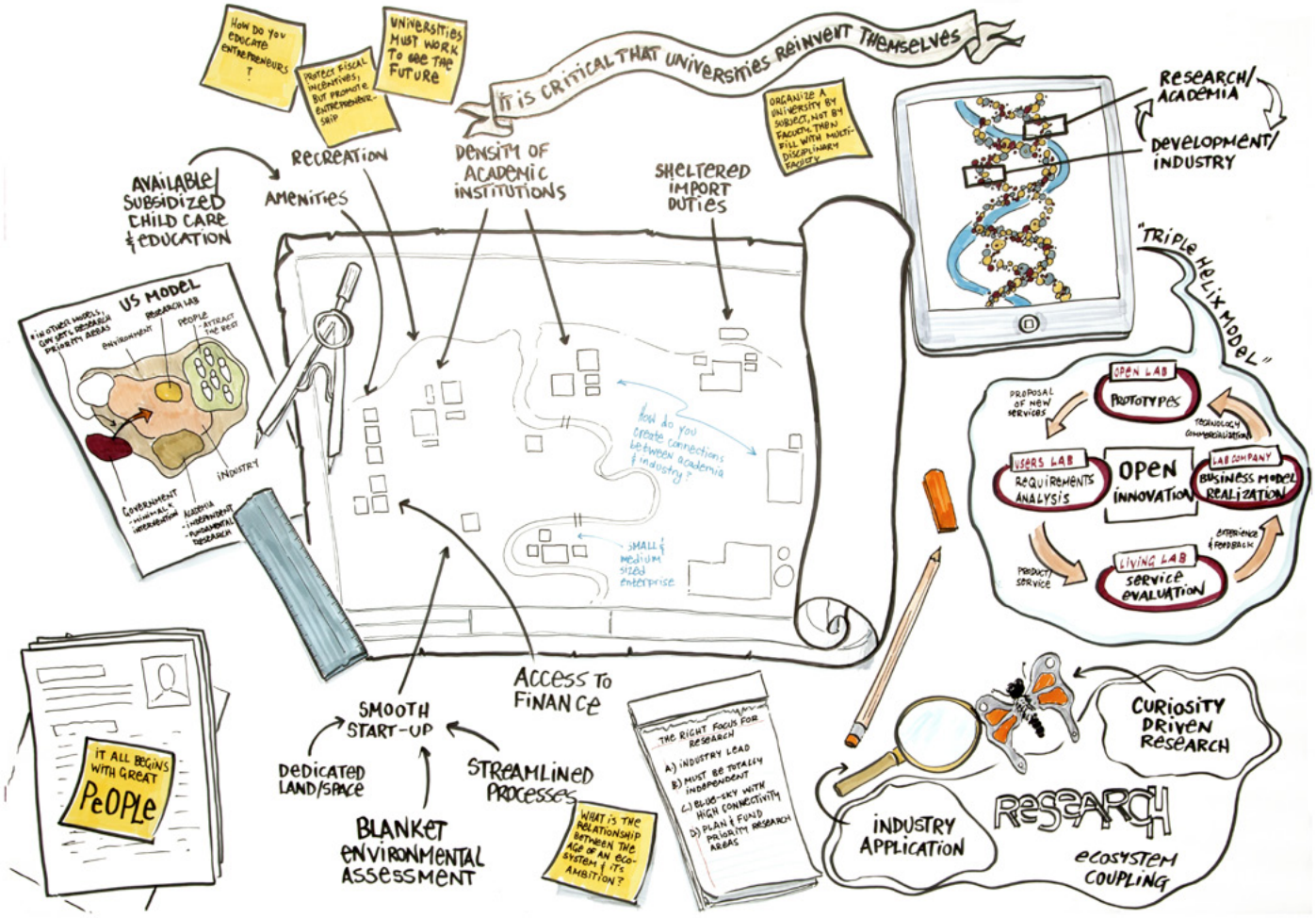

Gou-chung CHI

Professor, National Central University, former President of National Science Council, Taiwan

Hsinchu science park was founded in 1980s and is considered a major success story.

Today Hsinchu concentrates the highest educated population in Taiwan, hosting 6 universities and the country's main research centers. The park covers 6 Major Industries with revenue of $34.1 billion USD (2011) . 68.44% are covered by Semiconductor with $23.6 bilion USD and 19.08% by Optoelectronics with $6.6 billion USD. For that the Science Park employs 148,712 staff including more than 5000 foreign employees.

The science park was initially built next to the 200-year-old city with few connections, until recent efforts by the Science Park to help the city to develop further. Originally, the project was based on a vision of the Taiwanese Government, despite the fact that at the time, there was little specific knowledge among government planners about science park models. As such, the advice of foreign advisors weighed heavily in the design process. A key intention of the program at the time was to attract back Taiwanese talent and grow its own pool of expertise. The government took an active role in this initiative and continues to do so by supporting the park development with strong incentives to attract and retain talent and companies.

Differentiating elements of the model for the Park's design are as follows:

1 Availability of land: The land is State owned and has been managed under Park authority to generate high flexibility for companies or start-ups to settle. Agreements and contracts are streamlined with details such as environmental assessments having been pre-cleared for the entire Park area.

#2 Highly attractive tax incentives. Corporate income tax is 17%. R&D expenditure tax deductions can be up to 15% without exceeding 30%. No import duty for equipment and material is charged to companies which have major manufacturing and engineering capabilities, subsidies are granted and on the job training offered.

#3 A one stop service model:

a.) Infrastructures and Services: Hsinchu works as a specific ecosystem providing high quality infrastructure and living areas. The park pays special attention to the creation of an environment that prospective researchers' and workers' families would appreciate, including green spaces and international schools with very low tuition subsidized by the government.
b.) Complete Capital market: venture capital or stock market services are available onsite
c.) R&D and Operational model: the park is operational 24 hours a day. The employees' time has been reviewed to implement an optimized model to provide services to the community at limited cost. Staff are running on 2 shifts of 12 hours each, with 36 hours rest.
d.) Cluster Effect: such as for the IC industry gathering design, chemical, packaging, or manufacturing companies, for increased efficiency of the research and development
e.) High-quality Human Resources with the presence of 4 top Taiwanese universities.

This model has proven to be successful, first in 2000 when Hsinchu acted as a key driver in the retention of companies which were considering transferring their activities to China. Further, with students often staying over a period of 3-4 years in ITRI, during which time many register patents and start their own companies. The dynamism of the ecosystem is further demonstrated by the average age of the ITRI population, which is 33 years old.

Today Hsinchu is connected with 26 sister science parks in 14 different countries. Its main challenge is to further strengthen cooperation across industry, government, academia and research institutions to boost its R&D capacity with emphasis on increasing original patents, innovative capability and output. The focus of the Park remains on High-tech Industries, and the expectation is to increase the R&D/sales ratio of 6.02% to 10%. To support its ambition ITRI launched the triple helix program, a Hsinchu future open innovation model composed of an Open Lab for prototyping, a Lab Company for new business model definition, a Living Lab for service evaluation and a User lab for requirement analysis and interface design.

Group Discussion: Key Points

#1 Research campuses may not always have the luxury to start from a green field or from an existing unique location. Some need to create models where ecosystems are spread over large distance. This is the case of Caltech in Los Angeles where the challenge becomes to connect all the pieces together and make them one consistent and interconnected ecosystem

#2 In the challenge of recruiting and retaining the best talent, the attractiveness is not only determined by the presence of state of the art research facilities and interesting research challenges; many parks and institutions are putting efforts in offering a high quality living environment to the families of prospects: schools, services, recreational facilities and amenities. These initiatives are all the more important for countries where talent pools are to be found abroad.

#3 The typical organizing principle of educational institutions is to structure courses around faculty. Technion and Cornell shifted the traditional pattern to design a campus around defined topics for their common project in New York. The subject areas were then used as the structure around which a multi-disciplinary faculty could be assembled; addressing issues from both a social and technical angle. This perspective leads to a mix of faculties from different backgrounds and expertise. This new paradigm has been attracting many industries to invest and collaborate with the new campus. To complete the comprehensiveness of the educational experience, coaching will be done not only by faculty members, but also by industry players.

#4 There are many ways to balance between the freedom of researchers and the involvement of industry in setting research priorities. Some claim that research should be independent from any industry constraints and pressure, being curiosity-driven or following pure science. Others believe that it should serve the purpose and objectives set by the industry, with a strong emphasis on applicability. If philosophies underlying different models may vary, there is one consistent acknowledgement that innovation lies at the edge of chaos and order and researchers have to be connected to a larger ecosystem, which requires intimacy and mutual understanding with industries, triggering a healthy tension leading to creation.

#5 R&D is leveraged in different parts of the world as a driver for recovery of regional or national economies. After the fall of the wall, Dresden lost 70,000 jobs, necessitating the rebuilding of the local economy. While Brazil considers R&D and Innovation to be critical for sustainable growth after challenging periods in the past, Poland and Dresden use R&D and Innovation as the recovery booster to generate a new dynamism, creating companies - mainly SMEs - and employment while providing top quality education. So far the strategies used have shown clear results and success.

#6 The involvement of government takes different shapes depending on each country, culture and society. Singapore has an R&D strategy highly driven and monitored by the government while the State of Israel will fund the R&D but will not have a say in its management and direction. However, whatever the model applied, it is the role of academics to make predictions about what the future will look like, while R&D strategies represent a bet on that future.

“Universities must predict the future.”

Peretz LAVIE, President, Technion, Israel

“We need our GDP to fund our R&D so we need outcomes to generate growth and development.”

George LOH, Director, Strategy & Policy, National Research Foundaton, Singapore

“Our project is not based on faculty and field of expertise but based on subject. (...) We will look for academics according to the needs of the topics.”

Peretz LAVIE, President, Technion, Israel

“The usefulness of useless knowledge.”

Frédéric FARINA, Chief Innovation Officer, Caltech, USA

“Sometimes and in some places we need to artificially construct the connection and culture, as they don’t exist.”

Jean-Charles GUIBERT, Director MINATEC, France

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BALANCING RESEARCH, DEVELOPMENT & INNOVATION PORTFOLIOS

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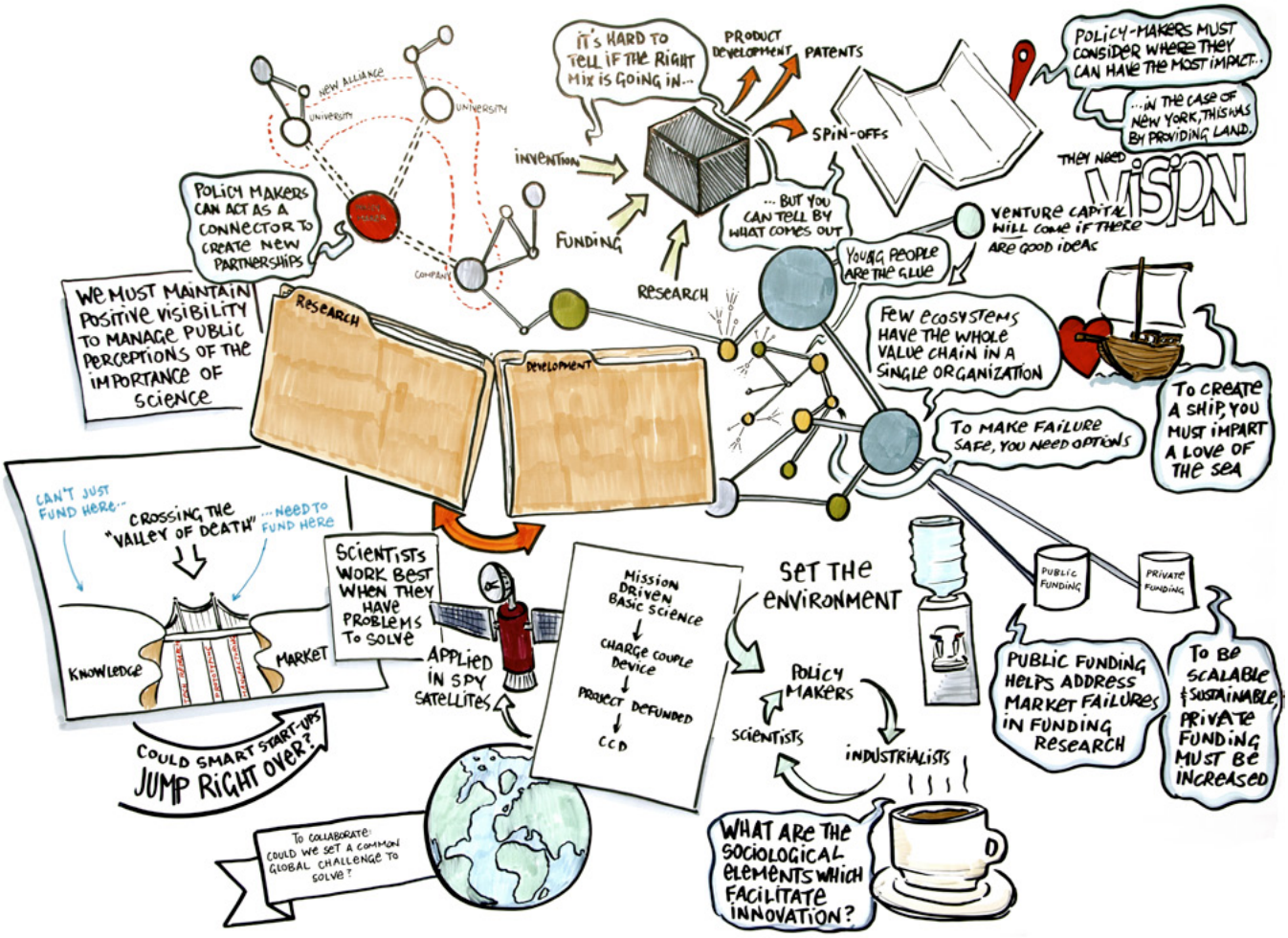

Eric ISAACS

Director, Argonne National Laboratory, USA

Argonne National Laboratory is one of the U.S. Department of Energy's largest national laboratories for scientific and engineering research, operated by the University of Chicago. In the words of its Director, Eric Isaacs, Argonne is a 'mission-driven' innovation ecosystem, where research aims at solving the nation's most important challenges in energy, the environment and national security.

Innovation is not something that can be pushed. Instead, one can work on the conditions for its emergence. The first real innovation ecosystem was the London 17th century coffee shop, a place where various people – from the individual scientist, to the industrialist, and the politician - could come and join in open discourse. Within 100 years, there were 80 coffee shops around London. One of them was used by a group called 'the Honest Wigs', a political party, which included the American Benjamin Franklin. It is there that Franklin engaged in a series of conversation with Joe Prisley, a teacher, who came to discover Oxygen aided, in part, by the exchanges he had while there.

The driver of innovation for scientists is tackling big questions, not job creation. Job and wealth creation is often touted as the ultimate goal of innovation. Whereas this might be its ultimate effect, there is a

danger of applying this metric to research work, as it doesn't stimulate scientists. Instead, scientists are driven by solving big problems. Currently, one major driver of innovation in the scientific field is the energy challenge, or how to generate, store and distribute the 100 terawatts needed to power the world by 2100.

A mission-driven environment is instrumental in making great things happen. Individual innovators will always have a central role in coming up with original ideas and driving them to fruition. Boyle and Smith received the Nobel Prize for their invention of the charge-coupled device (CCD). If the invention was the result of their ambition and ingenuity, the reason the CCD is nowadays so pervasive is because the military was willing to fund its development into spy satellites, which in turn created applications for devices of every day life like phones and cameras. Mission-driven ecosystems play the role of bridging the 'valley of death', which in turn allows industry to pick up the innovation and build on it.

It takes everybody to fill an ecosystem; the Government plays an important role in the formula. AT&T's Bell Laboratories was a powerful innovation ecosystem, largely helped by AT&T being a monopoly and getting tax breaks. One tenth of a penny spent by customers on a phone call served to fund the Lab, of which one tenth went into basic research, leading to the invention of the transistor, C language, Linux, and the laser among others. While Bell Labs had access to the entire value chain through AT&T, today, there are few labs outside of the pharmaceutical industry with that kind of access and support; collaboration is needed to take research to market. The collaboration with government-funded Universities and labs allows access to larger teams of people that can come together to solve the big questions.

Leadership is key to creating the right environment where research can come together with industry. The main contribution of a leader is to impart a vision. The New York story is an illustration of ecosystem leadership. Asking what could be done to reenergize the city's economy and to ensure that centres of excellence in banking, fashion, and marketing would continue to thrive, Mayor Bloomberg realized he couldn't recreate the ecosystem, but he could bring a vision and a space. The vision involved bringing young and hungry engineers to come together and invent the future together with industry. He donated land (at a premium in New York) for elite institutions to bid for the creation of a campus where the ecosystem could meet.

The glue of the innovation ecosystem is the youth. Many ecosystems have elite research institutions, industry connections and government backing, as well as venture capitalists ready to flock where good ideas arise. What ultimately makes the difference is to have young people passionate about taking ideas and transforming them into businesses. Therefore, it is critical to develop a culture where risk-taking is encouraged and where failure is seen as a badge of honor rather than the end of a career. Educating young people to build businesses around an idea and empowering them with job opportunities is the secret ingredient to the innovation ecosystem recipe. The role of leadership in the ecosystem is to build this culture and, in St-Exupery's words, to impart a 'taste for the sea'.

Make me a boat

If I communicate to my men
the love of walking on the sea,
then you will see them soon diversifying
according to their thousand particular
qualities:
that one will weave the fabrics,
the other in the forest will lay down the
tree,
the other still will forge nails
and it will be some share which will ob-
serve the
stars to learn how to control,
and all however will be only one.
To create the ship,
it is not to weave the fabrics,
to forge the nails,
to read the stars,
but to instead give a taste for the sea.

Antoine de St Exupery

Group Discussion: Key Points

#1 Ecosystem creation is an act of leadership. Mayor Bloomberg wondered: 'What are the one or two things I can do here to reenergize the economy?" He shared a vision, in which the future of the industry would be defined by the interaction of industry with scientists, and enabled it by bringing to the table a critical element that other partners could not: real estate. In Los Angeles, the Mayor espoused the same leadership traits, this time by bridging elite institutions under the common theme of CleanTech.

#2 Approaching innovation through big societal themes brings industry and science together behind a common agenda. The traditional scientific language speaks of 'labs', which are sometimes disconnected from directly relevant industrial priorities. This is how Technion and Cornell made a differentiated and winning project for New York bid by centering their proposal around three subjects instead of faculty: smart buildings, healthier life, and connected media.

#3 Mission-driven ecosystems produce focused and effective innovation. Missions, either set by industry or government, can produce highly effective and efficient innovation environments, and lead to concrete results, away from the chance encounters of a smart faculty member with an interested venture capitalist. Missions are contagious, likely starting with a few individuals and then spreading to many.

#4 No life after failure means no innovation. Youth is the glue to innovation and entrepreneurship ecosystems. While they can afford to take risks, if the culture of a place is risk-averse, or there are not other options or opportunities available to young workers, youth will go to corporate jobs and would-be entrepreneurs will leave. Silicon Valley is the anti-thesis of such an environment, where the more 'scars' a business leader has, the more respected he is, and the sheer volume of options give entrepreneurs plenty of options for a "safe landing".

#5 Connecting publicly funded research with society's interests can provide a broader support base. Creating higher visibility of public research programmes and clearly communicating their impact on citizens' lives and concerns is instrumental to reconnecting society with the worlds of basic and applied research. Helping people understand that the seed corn being developed will be the basis for their meal in the future is key to get public support.

#6 The correct balance and appropriate allocation of public and private financing is not clear. While public funding for basic research is critical for long term exploration and the creation of breakthroughs, jurisdictions in Europe have found a lack of funding to spur transfer and development have hampered their ability to take innovations to market. Other jurisdictions have spread funding across the development spectrum. The balance between public and private funding evident in each example represents the philosophy of each country, but none yet felt as though they had found the perfect mix.

“Public funders have to take things far enough into development before there’s an appetite for private funders to come in.”

Tim BESTWICK, Executive Director Business & Innovation, SFTC, UK

“You’ve go to throw the big questions to the scientists.”

Eric ISAACS, Director, Argonne National Laboratory, USA

“For us in Poland, the idea of innovation is about making use of the specific assets of our country.”

Marek NIEZGODKA, Prof., Interdisciplinary Centre for Mathematical and Computational Modelling, University of Warsaw, Poland

“Sometimes leading ecosystems is like herding cats; Mayor Bloomberg is putting the cat food where he wants the cats to go.”

Eric ISAACS, Director, Argonne National Laboratory, USA

“In Europe, we are actually better at generating knowledge than the rest of the world, but we have difficulty linking that knowledge with products.”

Gabriel CREAN, Director, CEA-Tech Europe, France

GIANT | HIGH LEVEL FORUM
Leading Innovation Ecosystems

THANK YOU

I would like to thank Jean Therme for setting up the first High Level Forum, which I believe will be the first step of a promising collaboration. I would like to thank him in particular for his unfailing support of this initiative.

After 4 days together, the High Level Forum revealed our diversity: the position of each ecosystem is explained by its historical context and starting point, initiating a specific model with each at a different point of maturity. As such, each of us can enrich his own vision and practices with the experience of the others. We noted two assets we can build on:

Our energy: we all are at the stage of reinventing, initiating or strengthening initiatives to foster innovation. As such, we can only benefit from cross-fertilization and our common dynamism.

Our openness: we all believe in open ecosystem and are looking for broader, stronger relations.

Our connection, partnership and friendship is the expression of an approach we believe in and that will strengthen each of our initiatives.

I think we can say that we all had a great time together, getting to know each other, creating a mutual understanding, and sharing the challenges we face in shaping new innovation models.

The High Level Forum generated a common ground of fruitful discussions that we can carry further by making a yearly event and thus, together, grow better and stronger.

It was our ambition for this to become a true global collaboration; it is our pleasure to host the Forum every second year in Grenoble, with alternating years being hosted at other participating ecosystems around the world.

Our friends from Caltech have already taken the initiative and has offered to host us next year in Pasadena.

THANK YOU ALL AND SEE YOU NEXT YEAR AT CALTECH!

- Marcel Morabito

Special thanks to Adèle Obert and the Capgemini Consulting team: Fabien Robineau, André-Benoit de Jaegere, Adeline Pairault, Greg Bernarda and Aaron Williamson

GIANT | HIGH LEVEL FORUM
Leading Innovation Ecosystems

Thank you to our guests speakers

"Innovation eco-systems: current models and governance"
Monday 9 July

Keynote Speaker: Jean THERME, Director of CEA-Tech, Founder of MINATEC and GIANT

Round Table:
- Hsinchu: Khuan-hsiu HSIAO, Deputy Director, Hsinchu Science and Industrial Park
- Karlsruhe: Horst HIPPLER, President, Karlsruhe Institute of Technology
- Montréal: Yves BEAUCHAMP, Director, Quartier de l'innovation, Montreal
- Jean-Daniel TORDJMAN, Senior Advisor for CEA-Tech, Former Ambassador

"Success criteria for world-leading innovation eco-systems"
Monday 9 July

Keynote Speaker: Patrick AEBISCHER, President, Ecole Polytechnique Fédérale of Lausanne

Round Table:
- Brasilia: Ronaldo MOTA, Visiting Fellow at the University of London, Former Secretary of State for Technological Development and Innovation
- Singapore: George LOH, Director, Strategy & Policy, National Research Foundation
- Tsukuba: Kenichi ICHIHARA, Mayor
- Thierry GRANGE, President, Grenoble Ecole de Management

"Preparing the future: self-sustaining industrial landscapes"
Tuesday 10 July

Keynote Speaker: Gou-chung CHI, Professor NCU, Former President National Science Council, Taiwan

Round Table:
- Dresden: Dirk HILBERT, Deputy Mayor
- Haifa: Peretz LAVIE, President, Technion
- Pasadena: Frédéric FARINA, Chief Innovation Officer, Caltech
- Jean-Charles GUIBERT, Director MINATEC and CEA-Tech / Technology Transfer

"Balancing of research / development / innovation portfolios"
Tuesday 10 July

Keynote Speaker: Eric ISAACS, Director, Argonne National Laboratory, Chicago

Round Table:
- Daresbury: Tim BESTWICK, Executive Director Business & Innovation, Science and Technology Facilities Council
- Pasadena: Dean WIBERG, Program Manager, Jet Propulsion Laboratory (NASA)
- Warsaw: Krzysztof KURZYDLOWSKI, Director of NCBiR, The National Centre for Research and Development
- Gabriel CREAN, Director, CEA-Tech / Europe