

Horizon 2020 has put a lot of emphasis onto empowering new entrepreneurship – people who execute ideas that will positively influence society or people’s life – Innovators in other words, because they create new or additional values by taking a new approach. But still, too many shy away or get trapped in “the Valley of Death” of Innovations. World IP Organization analysis different countries’ Innovation effectiveness annually, showing Switzerland a leader:

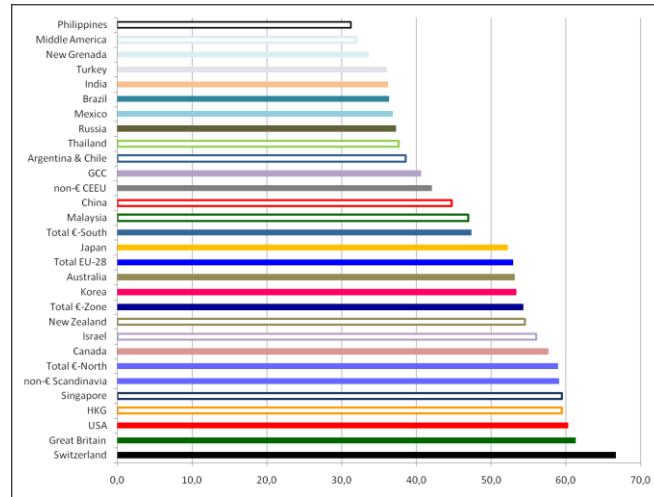


Figure 1

Innovation depends on actual implementation of economically appealing inventive ideas; otherwise the added value is never materialized and/or proven. Unfortunately perfectionism often cannibalizes learning curve working environments. A phenomena that becomes extremely wasteful when appearing as greedy impatience for results half the way through. So whether by hesitance, under usage or impatience, fear from Innovation actually causes prominently the waste of some of our most precious resources. Because looking at the details, Europe would be much better in Intellectual and Human Capital categories than it is in its entrepreneurial exploration (spreading significantly amongst its different regions):

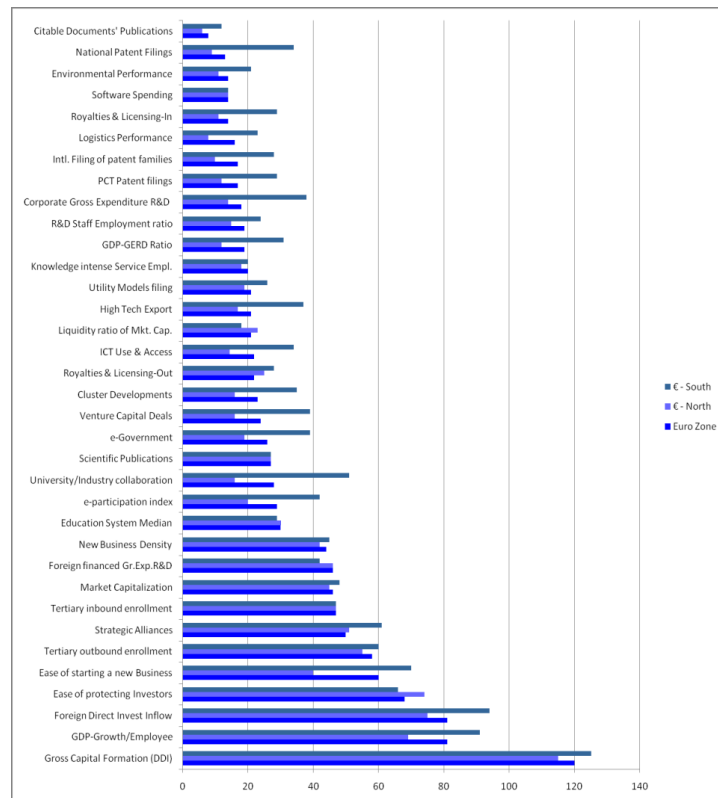


Figure 2

Operations research, or operational research in British usage, is a discipline that deals with the application of advanced analytical methods to help make better decisions. Because of its focus on practical applications, it overlaps with industrial engineering and operations management and draws on psychology science. It often must quantify execution risks of real-world objectives and has become an area of active academic and industrial research.ⁱ

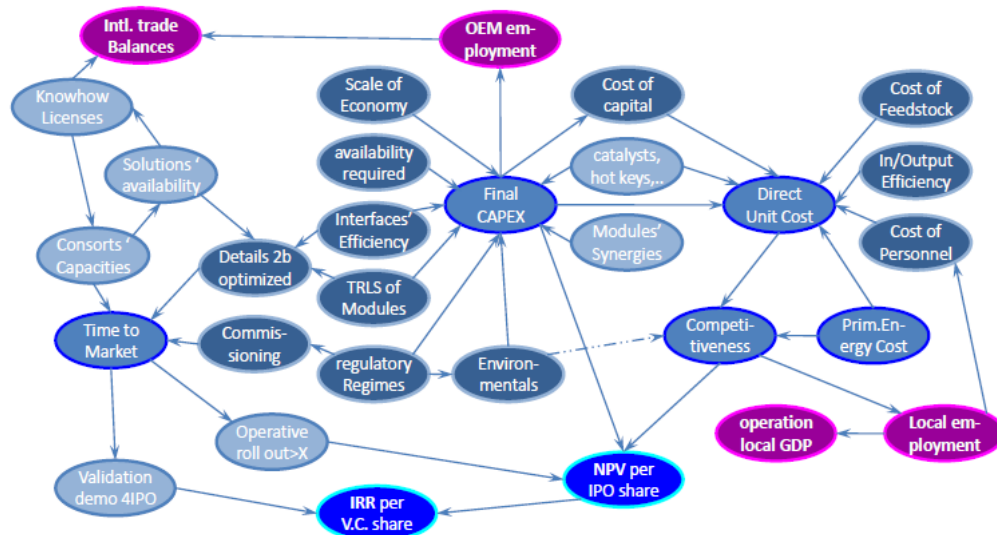


Figure 3

The usual procedure of a Bayesian probability assessment for such a Causal Model is to

1. formulate as many reasonable hypotheses as possible about what may happen;
2. construct a probability density function by prior similar scope project experiences published (e.g. Reports of Subsidized Lighthouse projects) for each hypothesis;
3. construct a function giving the probability of previously observed failure root causes to comparable projects, potentially also applicable to the assessment target;
4. combine the above information coherently to produce an overall probability distribution;
5. construct a Stage-Gate validation path which starts at the point of highest failure probability and 'scans' over high probability aspects, then intermediate probabilities, and finally low probability issues;
6. revise all the probabilities continuously during the progress by applying Bayes' theorem.ⁱⁱ

Common sense should indeed be sufficient to show us that, from the observation of what has in former instances been the consequence of a certain cause or action, one may make a judgment what is likely to be the consequence of it another time. The larger number of experience data available to support a conclusion, so much the more reason we have to take it for granted. But it is certain that we cannot determine in what degree repeated explorations confirm a conclusion is, in all probability, the source of many errors, which perhaps might in some measure be avoided, if the strength of analogical or inductive reasoning were more distinctly and clearly understood.

In other words, first validate where the biggest impact on expected performance may lie, then investigate where delinquency may impact viability of the undertaking less in sequence of chance for probability, before going after least probable and least affecting issues (but still possible due to limitations on mitigation of previous experienced events, regime changes, shifting spirit of epoch, etc.), until sufficient certainty of succeeding in a concept's TRL 6 Demonstration validation at acceptable cost expectation by simulation of scale-up.

The advantages of the Bayesian method are that all information available is used coherently (i.e., in a "leak-proof" manner) and the method can automatically produce estimates of the economic viability for a given success probability. That is, even before the start of spending

capex, one can say, hypothetically, "there is a 65% chance of meeting project expectations. That probability will rise to 90% after the first 100-days research and 97% after 160 days" or a similar statement, translating into corresponding indirect proportional cash spending rates.

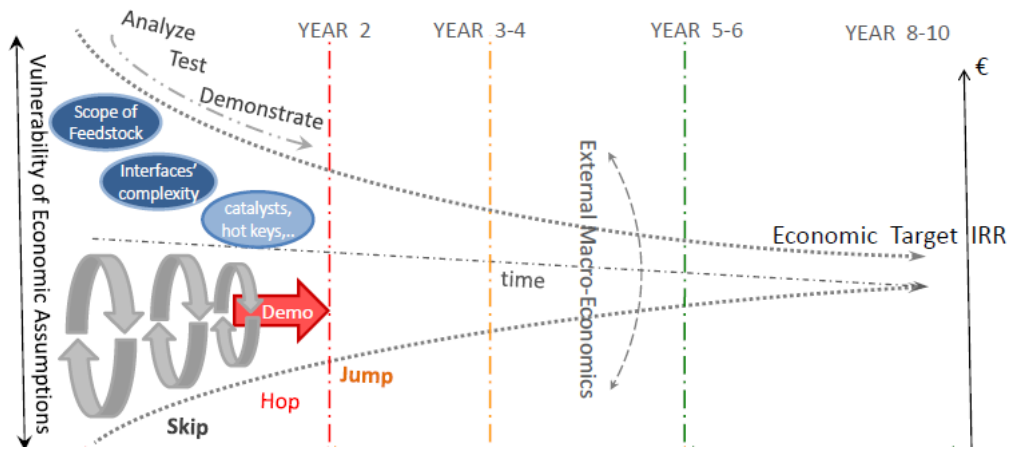


Figure 4

Mr. Bayes general laws of chance aimed to allow that an expectation depending on the truth of any past fact, or the happening of any future event, ought to be estimated so much the more valuable as the fact is more likely to be true, or the event more likely to happen.ⁱⁱⁱ

Failure Mode and Effects Analysis (FMEA) was one of the first systematic techniques for failure mitigation. It was developed by reliability engineers in the 1950s to study problems that might arise from malfunctions of systems.

Sometimes FMEA is extended to FMECA to indicate that criticality analysis is performed too. Special attention is paid to interfaces between systems and in fact at all functional interfaces.^{iv}

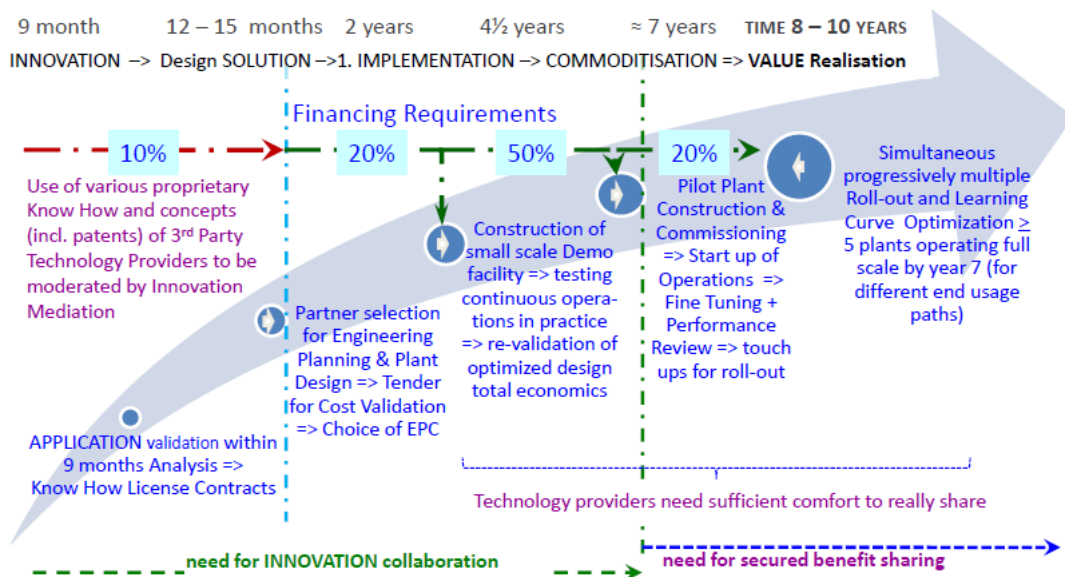


Figure 5

Stage-Gate[®] is a value-creating business process and risk model designed to quickly and profitably transform an organization’s best new ideas into winning new products or services. It takes an idea from inception to launch, by breaking it down into smaller stages (conduct of project activities) and gates (Go/Kill decisions by business evaluations). In its entirety, Stage-Gate incorporates Pre-development Activities (business justification and preliminary feasibilities), Development Activities (technical, marketing, and operations development) and

Commercialization Activities (market launch and post launch learning) into one complete, robust process.^v

Financing usually becomes an issue at Stage 3 (detailed design and development) after satisfactory conclusion of Step 1 and 2 (Step 0 – potentially innovative idea; Step 1 – scoping by feasibilities, Input/Output balances, scale per field of applications; Step 2 – Building the Business Case based on scoping results and integration assumptions). Since however Testing and Validation is Step 4 only, Financing is required antecedently to any tangible prove of added value realization. And Innovation financing has to be annuity-free.^{vi}



Know How development tailored to suit societal ("glocal") needs and prospects

- capabilities' mobilization towards positive **enhancement** of society or people's life
 - ⇒ undertaking Innovation Entrepreneurship pure
- relying on unique selling propositions & growth from **additional value to society**
 - Good Europe being # 14 in **Intellectual Property** Ranking;
 - but €-Europe's mean average GIRR ranking in **Business Environment** Ranking # 63
 - Capital Market** Activeness Ranking # 48
 - Cosmopolitan Attitude** Ranking # 44

Figure 6

Innovation starts from compiling knowledge and combining it with a sound understanding of framework conditions. Only the combination of an Invention with such Insight can deliver an Innovation – otherwise there won't be a guarantee for an added value from the Invention. So an Innovation always relates to a specific application, but remains an idea only, until it is actually implemented physically, so it can deliver added value from the new approach. Because unless the new idea or approach delivers additional value to society it maybe just a tragic Invention only. Respectively Innovation is the basis for Qualitative Growth!^{vii}

While financing Steps 3 and 4 may be seen equivalent to Software Development domains, Hardware Development usually requires 90% of its financing for Steps 5 (Launch + Learning Curve) & Step 6 (Roll-Out), but can't become a business case, if investors want liquidity and return back after Step 5. Therefore we designed a differentiated risk/opportunity profile financing structure for one of our own game changing innovative approaches and published it at EWGCFM 51 for the first time.^{viii} Therein we basically had come to the conclusion that INNOVATORS should acquire their STAKEHOLDERS from following groups:

- i. SUPPLY CHAIN PARTNERS, delivering input, (license-) producing output and taking it off, by committing to jointly invest 40% of Equity needed for the Business Case at CALL by successful conclusion of Step 4 (DEMONSTRATION).
- ii. VENTURE CAPITAL PARTNERS who finance STEPS 3 & 4 (ca. 10% of Equity needed for the Business Case) with a need to turn their interest into an INTERCHANGEABLE ASSET upon:
- iii. INSTITUTIONAL and/or PRIVATE FAMILY OFFICE INVESTORS hedged by SURRENDER OPTIONS of ALL SUPPLY CHAIN CONSORTS' SHARES to possibly compensate against residual short-falls in performance beyond the end of 5th year double equity capital through purchase of 30% new shares in an IPO, as soon as ALL SUPPLY CHAIN CONSORTS paid their CALL CAPITAL in.^{ix}

Differentiated Risk Profile at e.g. U\$ 150mln paid-up Stock Corporation

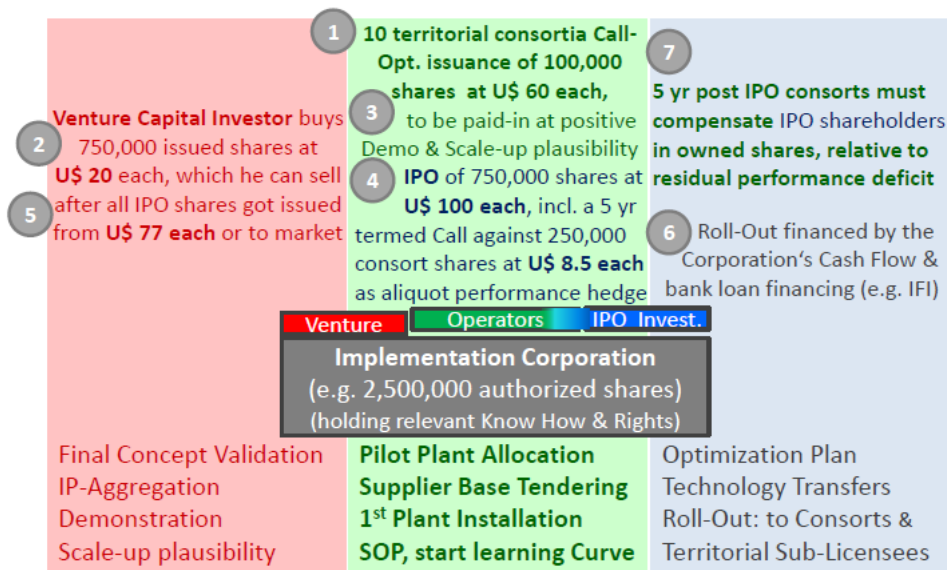


Figure 7

In EWGCFM 52nd's break-out discussions in Vienna, potential new fields of services from the ad joint scientific partners were precluded by introduction of the Knowledge and Technology Brokerage concept.^x

Since having gained the impression that Financial Modeling has so far not engaged in developing Risk Management Tools helping to bridge the funding gap for innovation^{xi} by depicting the afore said best management practices and probability theorem in an applicable model, I would like to solicit experts', prospective and graduated scientists' amongst this conference's audience help towards securitization of 1st time implementation of innovation.

Horizon 2020 seems to offer facilities for that and if not, I could go for a SME INST-2-2014 Call. By complementing the "Knowledge Triangle" concept with a Financial Model Tool the TECHNOLOGY BROKER could evolve into an INNOVATION MEDIATOR – Europe could need such Qualitative Growth accelerators most urgently, lacking demographics for quantitative growth.

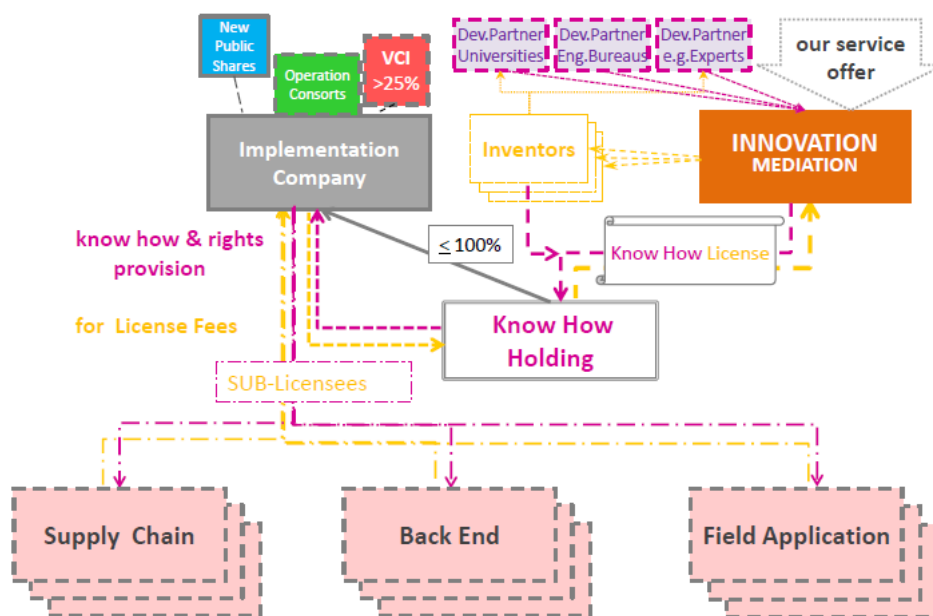


Figure 8

ⁱ <http://en.wikipedia.org/wiki/>

ⁱⁱ Thomas Bayes (/ˈbeɪz/; 1701–1761)

ⁱⁱⁱ Richard Price in a Letter to John Canton; Nov. 10, 1763

^{iv} Project Reliability Group (July 1990). Koch, John E., ed. Jet Propulsion Laboratory Reliability Analysis Handbook

^v Stage-Gate® International Inc., official web site

^{vi} Stefan Petters, “Asset – Intellectual Property”; ICON 2013 Vienna, April 2013

^{vii} Stefan Petters, „Financing Innovation“; ICON 2014 Vienna, April 2014

^{viii} Stefan Petters, “Organic Waste Treatment in urgent need for Innovation“; EWGCFM 51 London, May 2013

^{ix} Stefan Petters, “Potential Economics from Organic Waste’s Carbon Recycling“; ISWA 2013 Vienna, Oct 2013

^x Manuele Monti, Ph.D., „Towards academic research and practitioner convergence in the EWGCFM network“; EWGCFM 52 Vienna, Dec. 2013

^{xi} Bronwyn H. Hall, Berkeley University-, of Maastricht, National Bureau of Economic Research, U.S.A., and the Institute of Fiscal Studies, London „The Financing of Innovation“, Oxford Review of Economic Policy article from Jan. 2002’s Dec. 2005 revision