

## Viewpoint

# Experiencing experiments: a multiplayer game for sharing ideas

## Crusoe gives way to Gulliver

**Martin Curley and Piero Formica**

**Abstract:** *In this latest in a series of articles on the innovative use of experimental business laboratories for high-expectation entrepreneurs, the authors focus on the networking benefits of business lab experiments. Distinguishing between ‘Robinson Crusoe’ types, whose tendency is to operate in isolation, and ‘Lemuel Gulliver’ types, who rely on interaction with others, they suggest that engaging Crusoe entrepreneurs in the open participatory environment of the experimental laboratory encourages them to discard their bad habit of working in a closed environment in favour of interaction and sharing. This, the authors argue, is an essential change in light of the evolving process of innovation, which is moving from a closed process through an open one towards a future in which competing innovation networks become the norm. They demonstrate the nature of contemporary entrepreneurship and innovation by drawing analogies from physics and the article closes with a case study of their theory in practice.*

**Keywords:** *innovation process; entrepreneurship; business experiments; start-ups; networking*

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‘For the things we have to learn before we can do them, we learn by doing them.’ (Aristotle)  
‘A journey of a thousand miles begins with a single step.’ (Lao Tzu)

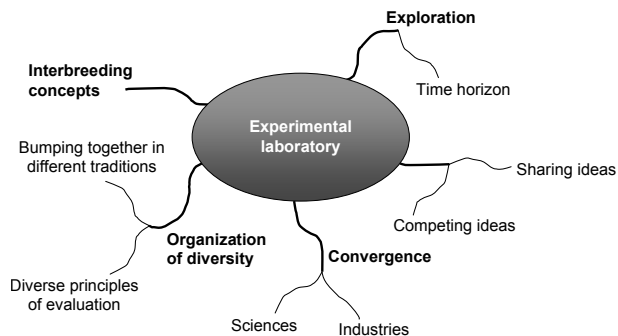
‘Experiencing experiments’ are the first step aspiring entrepreneurs have to take. To blaze new paths, to try something new – an innovative act or procedure for the purpose of nurturing high-expectation start-ups: this is the mission that business experimental labs pursue (Curley and Formica, 2008). Any experiment thus conducted is a step-by-step process of creating, probing, testing and scrutinizing business ideas and thinking. The end of each stage is a gain in experiential learning. Through learning by doing, direct experience and observation, interaction with peers and other active experimenters (both experts and non-experts – see Curley *et al.*, 2011), the aspiring entrepreneur constructs and derives meaning in relation to the relevance, practicability and profitability of the business idea under experimental investigation. Rapid learning cycles are of critical importance. The transformational result is an idea translated into a start-up with a commercially scalable business model.

### Experiment–possibility frontier

Participants in laboratory experiments start a real enterprise rather than just learning about business with cases or taking part in business games and role-plays. The focus is on how to ensure that the reality does not fall short of what the experimenter desires. Any aspiring entrepreneur can experience experiments by adopting, in different combinations, ‘Robinson Crusoe’ and ‘Lemuel Gulliver’ behavioural modes, as described below.<sup>1</sup>

The ‘Robinson Crusoe’ type is an aspiring entrepreneur whose habits (depending on his or her disposition, pattern of behaviour, motivations and attitudes to entrepreneurship) exclude the influence of peers, for example through an absence of strategic interaction. In pure Crusoe mode, the experimenter gains experience by practising experiments in an isolated environment. ‘Crusoe’ has to make do without other people. This means that he or she is constrained by artificial boundaries, shows no interest in interaction and believes that the costs exceed the benefits of interactions such as talking to and learning from other experimenters. Using an analogy from physics, ‘Crusoe’ exhibits the effects of Heisenberg’s Uncertainty Principle, being simultaneously unaware of both the value and momentum of a venture.

Unlike Crusoe, the ‘Lemuel Gulliver’ type is a would-be entrepreneur who confers a primary role on intensive and laborious interaction with peers from different cultural and business backgrounds. All participants focus on building their company – which fosters comradeship and shared understanding. In the pure Gulliver mode, the experimenter fully exploits the potential of interaction. The assumption is that the more



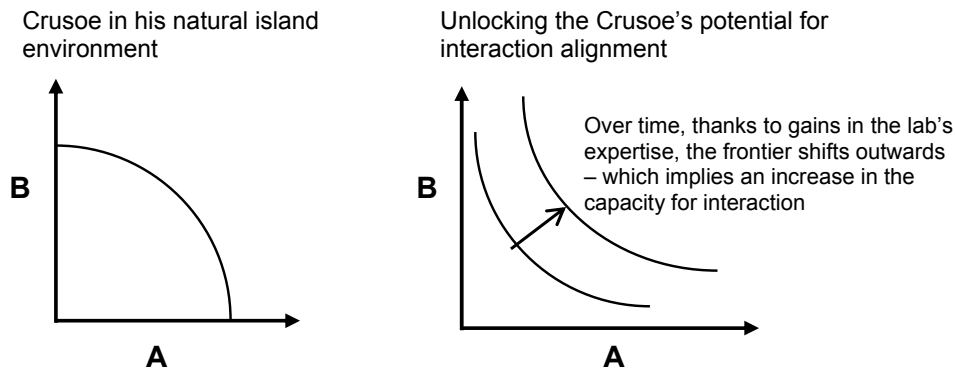
**Figure 1.** Experimental lab – a participatory environment of open innovation for entrepreneurship.

*Note:* ‘Open innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology.’ (Chesbrough, 2003.)

they are connected, the more intensive are dialogue and discussion, conflict, disagreement and the questioning of existing premises, and the more they can gain experience by combining knowledge and insights from experiments conducted by networked peers. The corollary to this assumption is that a Gulliver-type experimenter embedded in a wide and diverse range of his or her peer population has a better chance of riding the waves of changes and achieving creative breakthroughs from experiencing experiments. Thus, in effect, Heisenberg’s Uncertainty Principle can be somewhat negated, because the close interaction with other researchers eliminates much of the uncertainty and there is then a far greater ability to measure simultaneously both the value and projected momentum of a nascent venture.

The experimental lab creates patterns that connect aspiring entrepreneurs with different ideas and personalities: it connects the ‘Crusoes’ and the ‘Gullivers’. By experiencing experiments in a participative environment of open innovation for entrepreneurship (Figure 1), they learn whether and how the same idea could be used in different fields. To take advantage of the multiplier effect of sharing<sup>2</sup> – ‘I am going to use my idea in my field, and you are welcome to use it in your own field’ – the Crusoes must give up their bad habits from working in a closed environment in favour of interaction. In doing so, they will have to bear the opportunity cost measured by the number of ‘units’ of the ‘Crusoe habit’ foregone for one or more ‘units’ of the ‘Gulliver habit’.

Economies of experience, which in the experimental lab environment are the equivalent of the experience curve in manufacturing, reverse the upward trend in the cost curves (both the cost of experimentation and the



**Figure 2.** The Crusoe-type experimenter's perception of the experiment-possibility frontier before and after engagement in an experimental lab network. (A – Gulliver's habits; B – Crusoe's habits).

*Note:* The left-hand graph shows the increasing opportunity cost of interaction based on Crusoe's personal insights. The concave experiment-possibility frontier represents increasing opportunity costs. The right-hand graph shows the lab's effect on Crusoe's personal insights. A bulge towards the origin of the experiment-possibility frontier implies Crusoe's convex preferences – that is, the decreasing opportunity costs of interaction.

opportunity cost of interaction). In fact, the more often experiencing experiments are performed, the lower is the cost of doing them; and the longer Crusoe personalities benefit from the opportunity to work in a team with Gullivers, the more they unlock their potential, transform their specialized resources from Crusoe-use to Gulliver-use and, therefore, achieve a decreasing opportunity cost of interaction. When experiments are run numerous times, even the Crusoes, individually very productive, give way to and turn into Gullivers (Figure 2).

The stories of Crusoe and Gulliver can thus be used as metaphors for the very significant shift that is happening in innovation and entrepreneurship processes and environments. We are moving quickly from a closed innovation process through an open innovation process to a scenario in which competing innovation networks become the norm. Sustained success results from contributing to and benefiting from a network or ecosystem which continuously creates new value and has higher velocity than other innovation networks: witness the growth of the Apple iPhone®/App store and Google Android® ecosystems. Aspiring entrepreneurs attaching to these ecosystems can benefit from the velocity of these systems and experience the creativity that is continuously unleashed.

At the core of Chesbrough's (2003) open innovation concept is the notion that innovation can be made more efficient and effective by the sharing of ideas and intellectual property between organizations in a controlled environment. Chesbrough, in his seminal book (*ibid*, 2003), focuses his open innovation thinking on established organizations. There is significant value to be gained in extending this concept to early-stage entrepreneurs.

Samelin *et al* (OISPG, 2011) argue that a new form of open innovation is emerging which involves all actors in the ecosystem; Vallat (2009) recommended taking a broader view of networking, in order to take better advantage of the social capital at the disposal of firms. Extending this idea, networking and collaboration should be able to take optimal advantage of a particular ecosystem's capital.

Conducting experiments to determine potential outcomes and to ascertain the possible range of reactions of customers and other ecosystem stakeholders to potential new ideas and innovations can be of significant value. Sharing these ideas between trusted collaborators can reduce uncertainty and provide guidance on the likelihood of success or indicate where changes of strategy may be needed. Indeed, the synaptic firing which may occur between entrepreneurs can lead to rapidly improving ideas. As well as using interpersonal and interorganizational conversations for experiments it is likely that Game Theory can accelerate the experimentation and learning process.

Game Theory embedded in software can model human and ecosystem organizational behaviour. It is often based on assumptions about how humans and organizations will react to changes or innovations based on what they perceive to be in their best interest. This is a version of the 'invisible hand' to which Adam Smith refers in his *Wealth of Nations* (see <http://www.econlib.org/library/Smith/smWN.html>). A key use of Game Theory might be to help assess where value will be captured in an ecosystem when a new innovation, or product or service, is introduced. A new venture or innovation may be sustainable only if a win-win scenario is created for the other members of the ecosystem (but not necessarily competitors).

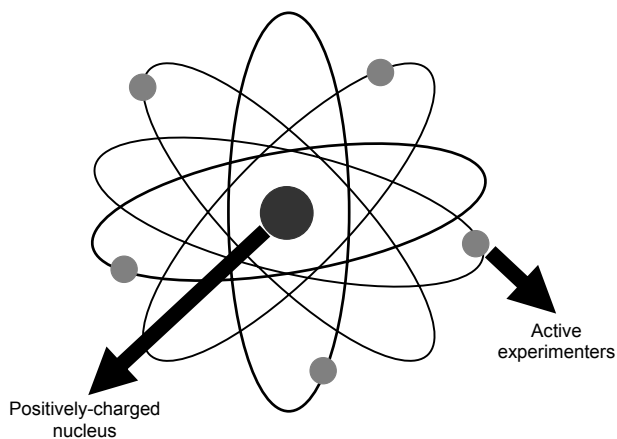
By assigning a value to the estimated utility of a potential innovation compared to the normalized value created by existing materials, products and services in an ecosystem, and then estimating the probability of adoption, rebuttal or even counter-initiatives by ecosystem stakeholders (including end-users), and running multiple simulation runs, some uncertainty can be removed from the entrepreneurial process. For estimating where value could be created, a portfolio optimization schema such as that advocated by Von Neumann and Morgenstern (1944) could be used, and then solved through linear programming to identify where the most value might arise among stakeholders. This finding could then be applied in formulating a strategy to leverage the ecosystem for the entrepreneurial activity.

### The value of conversion: venturing into physics

Entrepreneurship goes beyond the manner (*nómos*) of dispensing a business idea. It has a real nature (*physis*), visible in the process of conversion (transmutation) of input into output resources, which occurs through ‘entrepreneurial reaction’. When we look closely at how the process works for high-expectation and high-growth start-ups, which move at lightning speed, there is a need to examine the ‘reaction’ on a very small scale. The principles and lessons that emerge from such an examination will be far more important than writing a formal and static document such as a business plan.

In this context, the entrepreneurial reaction examined through the lens of experiencing experiments leads to the exploration of an emerging science – ‘econophysics’,<sup>3</sup> as it has been dubbed, which employs tools from physics to study markets. Specifically, the subfield devoted to the analysis of reaction highlights microscopic elements whose configuration resembles atomic structure.

Although at first sight the attempt to explain the entrepreneurial process in terms of the scientific discipline of physics may appear too contrived, there is some insight to be gained in an analogy between business ideas, the units of entrepreneurship, and atoms, the units of matter. At the centre (the ‘nucleus’) of a new venture creation, there is a positively-charged idea whose initiator has to make sense of it and construct a vision. Almost all of its ‘mass’ is made up of strongly interactive, not easily distinguishable ‘particles’ – the motivations and attributes<sup>4</sup> in entrepreneurial behaviour (see Table 1 in Carayannis and Formica, 2006) – in the ‘nucleus’ around which active experimenters are arranged in orbits. The orbiting experimenters are responsible for the ‘chemical’ properties of the idea



**Figure 3.** The atomic structure of an entrepreneurial creation.

*Note:* This is the popularized image of an atom. It was created in 1904 by Hantaro Nagaoka (1865–1950), a Japanese pioneer of physics, who developed this planetary model of the atom (Bryson, 2003).

such as practicality, profitability, sustainability, and so on (Figure 3).

It is necessary for the ‘particles’ of motivations and attributes to be placed in a ‘magnetic’ entrepreneurial field and gain entrepreneurial energy, which is the capacity to do entrepreneurial work, in order to effect the transition from the state of entrepreneurial intention to that of entrepreneurial action. ‘Entrepreneurial energy’ (*E*) and ‘mass’ (*M*) are two sides of the same coin. The cube of creativity (*C*) in business – that is, (creativity in technology) × (creativity in process) × (creativity in marketing) – is the conversion rate between the two. The Gulliver spirit of free discussion, open criticism and wide collaboration within the experimental lab enhances the speed of creativity, which is ‘like a beam of light that spotlights one or more opportunities to start a business’ (Carayannis and Formica, 2006). Hence:

$$E=MC^3$$

An entrepreneurial reaction takes place when the ‘nucleus’ undergoes some kind of change, releasing the energy needed to transform business ideas into real ventures. In experimental labs, people from different industries and professions look at what one of them is doing with fresh eyes, and most changes occur through the adaptation and reinterpretation of one person’s unfettered ideas in response to other people’s ideas. By building upon one another’s ideas, participants in experimental labs thus increase the number of ideas that can develop successfully. Strong networks of people freely exchanging ideas are made possible by decreasing the opportunity costs of interaction and increasing the

capacity for interaction (see the right-hand graph in Figure 2). From a small input into a network, a large output of entrepreneurial outcomes can be produced.

When the nascent entrepreneur approaches an existing innovation ecosystem with a strong focus on experimentation, this can create the conditions for an experimental outcome which will catalyse an autocatalytic reaction, spurring subsequent and derivative innovation. Schumpeter (1912) introduced the concept of innovation as associated with a production function, with progress coming from a new intelligent combination of production means and production conditions. What better way to explore new intelligent combinations that exploit emerging technologies than to have active experimentation and continuous dialogue? High-expectation entrepreneurs should look for a host vertical industry, in which they can see opportunities for intersectional innovation (Curley and Formica, 2011). Here we see the 'Medici effect', as described by Johansson (2004), in which significant and breakthrough innovations happen at the intersection of different industries and disciplines. Amazon provides examples of these disruptive game-changing innovations, first with its new bookselling business model and then with the Amazon Kindle® for electronic book distribution. Both these innovations have dramatically accelerated the adoption and diffusion of information products (books). Amazon's continued progress through the development of its EC2 cloud platform demonstrates how experimentation leads to further progress.

Marc Andreessen, the co-inventor of Mosaic, claims that 'Software is eating the world' (*Economist*, 2011). This is a description of the phenomenon we observe as Moore's Law collides with a virtual domain.<sup>5</sup> Aspiring entrepreneurs would do well to examine the full value chain effects of this 'digitization' process, to identify areas of best opportunity.

While traditional factors such as access to finance, the regulatory environment, leadership and management skills and availability of a workforce and associated skills are important for successful entrepreneurship, soft vectors such as 'social connectivity and networking' are, increasingly, becoming real differentiators for entry into an ecosystem; or indeed the creation of a new ecosystem.

## The decoupling hypothesis

According to the school of thought that prevails in the incubation industry, the business idea and the business plan are coupled together. The business idea can be likened to an ocean liner that has to leave the harbour (the incubator): the business plan is the tugboat pulling the liner out of port. Thus the business idea is the

dependent element: to reach the open sea, it has to rely on the perfunctory procedures and calculations of its tug boat, the business plan.

Serial entrepreneur Shai Agassi has drawn parallels between the principles of business and the laws of physics to emphasize 'the importance of acting on an idea before it's adopted by the mainstream and navigating the inevitable uncertainties that can result in success or failure'.<sup>6</sup> Following this train of thought, the hypothesis underlying experiencing experiments is that each and every business idea is decoupled from and independent of the business plan. High-expectation aspiring entrepreneurs are early entrants in the marketplace. They experience a complex reality and the irreducible uncertainty of a market that does not yet exist or is still in its infancy. Such a challenge requires a multilayered endeavour as well as the consideration of probability, rather than the usual coupling method based on 'I do my best to ensure that my idea is the one that wins out' and 'I stay with the certain measurement of my business plan'.

On the one hand, with 'Crusoe' giving way to 'Gulliver', a lower level of resistance to shifts in direction reinforces the motivation to build one idea on another until a breakthrough is reached and 'before it's adopted by the mainstream'. In the experimental labs, two or more nuclei of business ideas come into very close contact with each other and thus may fuse together to produce unusual findings that fall outside existing categories.

On the other hand, it is by looking at the distribution of business ideas through the lens of quantum physics that it is possible to control the probability that one business idea will go to one marketplace or another. Laying down the probability distribution of 'quantum packets' of business ideas with different amounts of entrepreneurial energy is a major task that the experimental lab has to accomplish.

Whilst the Crusoe type is justifiably concerned with predation (that is, the stealing of ideas) that might occur in an experimental lab, it appears that the benefits of 'co-opetition' and symbiosis outweigh the danger of predation. In the experimental lab, one should experience a high level of interaction resonance, enhanced by a richness of information flow. The experimental lab is a vital, living place where exchanges of energy, ideas and, indeed, partially of resources, are numerous and sustainable. Many believe that relationships are the foundation of all accomplishments and the experimental lab is based on this principle. In addition, Sveiby (1997) has said that '...trust is the bandwidth of communication' and, in a well-managed experimental lab with sufficient diversity of raw ventures, high levels of trust and strong relationships



may well manifest themselves. In the experimental lab, new innovations and ventures are outcomes of the ecosystem, with the interaction of processes, resources and ideas creating a living ecology. Such an ecology can be virtual, with contributions from dispersed physical resources and locations.

### The theory in practice – a case example

The discourse on experiencing experiments has brought us close to interlocutors – participants in the process – eager to scale up their entrepreneurial expectations. They are, for the most part, aspiring entrepreneurs whose strong impulse to innovate qualifies them as ‘economic activists’. We offer here some evidence of how one of these interlocutors has lived the experience of setting up his own business, from the standpoint of an active experimenter.

Nicola Farronato graduated in business at Cà Foscari University in Venice and is the founder of the open network *Young European Avant-Garde Minds*. On the anniversary of his tenth year at work, Nicola was wondering about how to make a greater impact through what he was doing. In his own words: ‘Up to that moment, many times I had been told I had greater potential. Each and every one of those times my expectations were scaling up, but looking at where I was and what kind of shift I could make, I found myself unable to effectively unleash my innovation energy’.

This changed on the day Nicola found inspiration in the role played by knowledge-driven entrepreneurs (Andersson *et al*, 2010), with whom he was eager to include himself. This was the key that opened the doors for him of the Intentac (International Entrepreneurship Academy – [www.intentac.org](http://www.intentac.org)) and IVI (Innovation Value Institute – [www.ivi.ie](http://www.ivi.ie)) ecosystems. ‘It was the beginning of 2009,’ said Nicola, ‘when I started to get closer to the partners and members of this interactive ecology, whereas at the outset I was relying on it mainly for networking purposes. In a few months the Intentac and IVI ecosystems accelerated the extension of my entrepreneurship and innovation network, as well as my shift from business developer to would-be entrepreneur.’

Nicola has made it a habit to profit from the experiencing experiments formula, combined with access to a number of high-level fellows of both Intentac and IVI. ‘As this was my first experience as [an] entrepreneur,’ Nicola says, ‘I had a lot to learn and could not wait too long to start the journey, even if everything appeared uncertain. The overall economic climate and the heavy fall in demand in 2009 and 2010 seemed not to be promising for starting a new business. Nevertheless, a lean start-up and learning-by-doing through experimentation looked like the best approaches to spurring entrepreneurial energy.’ Living in Italy and travelling often to Ireland, to the epicentre of the experimentation activities of both Intentac and IVI at the National University of Ireland, Nicola made a difficult decision on which entrepreneurship platform to adopt. Having a digital idea to convert into a web start-up, he wanted to blend the brand and design culture with a high-tech environment. In the end, Nicola decided to start his own business in Dublin, an entrepreneurial environment close to his vision, supportive of a lean start-up and a centre for the experimentation practices.

‘Our business process development was well in place,’ Nicola argues, ‘and we tried to get continuous feedback from the stakeholders we were daily connecting with. We had a lot of support in our early days in Dublin from peers and other active experimenters in the Intentac–IVI ecology, and we were able to gain pre-seed funding and mentoring through the LaunchPad programme at NDRC [National Digital Research Centre]. We were the first international team admitted to this early-stage acceleration programme and we are thought to be among the first overseas entrepreneurs starting up in Ireland after the financial crisis’ (see Box 1).

B-sm@rk Ltd, Dublin – the company co-founded in 2010 by Nicola – is a start-up with expectations of exponential growth which plans to launch a revolutionary marketing service in the early part of 2012 (see Box 2). The formula for experiencing experiments is driving the company’s founder to steer and validate his business idea in the shortest time possible, making efficient use of personal resources (finance) and any

#### Box 1. National Digital Research Centre: from ideas to income.

‘The National Digital Research Centre (NDRC) is an Irish independent enterprise dedicated to practical, market value focused innovation. Start-up experiments are made at the NDRC’s Inventorium, which is a ‘programme designed to find innovative digital ideas and turn them into sustainable businesses. [By] providing spaces for engagement and collaboration across sectors, communities and disciplines, and focusing on open innovation, Inventorium works with participants at events, but also with people who contact them directly. NDRC’s Inventorium helps bring together the teams and mix of skills needed to accelerate great ideas.’

Source: NDRC Annual Report (2010–2011).

**Box 2. The theory in practice – B-Sm@rk's smart mark**

'A year to the day after being formed, digital media company B-Smark has launched a public beta of its first product, an online service that lets people attach an emotional tag to content on social networks. The company has also beefed up its advisory board with experienced marketers and entrepreneurs.

MySmark is the company's first product, a digital *smart mark* people can use on friends, links, posts, photos, events and videos that have been posted on social networks. The service is initially available for Facebook and Twitter, with other social platforms planned.

The 'Like' button for interacting with content is anonymous – MySmark is a layer above that,' says B-Smark co-founder Nicola Farronato.

Users create their profile at MySmark.com, with an individual smart mark in the form of a flower-shaped widget consisting of 32 emotions. They can then register any of those moods about a piece of content and share it online.

Farronato says the attraction for a brand, product or service is that they can use smart marks to get market feedback in real time'.

Source: Smith, G. (2011), 'B-Smark allows users to attach emotional tag to content', *Irish Times*, 23 September 2011.

other funding schemes available. Through the experience gained by participating in experiments, Nicola has learned how to conduct a multiplayer game for the purpose of building on others' ideas. He has also learned how to build an entrepreneurial option – different from the original – using loosely-structured, flexible and interactive teams.

In order to pursue sustainability and maintain a smart approach to innovation, Nicola is setting up collaboration agreements with a number of technical universities in Europe, thereby involving postgraduate students with the company's operations in Ireland. As Nicola puts it, 'Diaspora entrepreneurship is part of the international brain circulation that enhances our business idea by attracting partners from all over the world. Diversity is a critical asset in our organization. It brings added value when talking about cross-fertilization between cultures and domains'.

Nicola's experience illustrates the evolutionary nature of experimental labs. Confronted with the conventional model of the incubator, laboratory experiments are currently a highly controversial topic. But, we would suggest, the process of participating in a multiplayer game which generates the content of experience is both desirable and possible. The experimental business lab, in making that process practicable, can be of great benefit in raising a new breed of high-expectation entrepreneurs.

## Notes

<sup>1</sup>These fictional characters from 18th century novels were chosen to characterize the types because of their very different experiences of learning and survival. The shipwrecked hero of Daniel Defoe's *Robinson Crusoe* (1719) learns and invents means of survival largely through his own reflections and personal experience, but he remains isolated on his desert island. Lemuel Gulliver, in Jonathan Swift's *Gulliver's Travels* (1726), on the other hand, learns and develops through his constant interaction with different beings and cultures.

<sup>2</sup>According to the first law of knowledge dynamics, 'knowledge multiplies when shared. The resulting knowledge energy is manifested through a broad range of mechanisms that includes Innovation Management, Leadership for Value Creation,

Knowledge Pattern Recognition, Knowledge Mapping, Knowledge Networks, Social Cybernetics, Mental Models, Situation-Handling, and Capital Systems. Since knowledge is inherently a human process, we must take care to optimize its creation and flow in ways that minimize loss in the transmission process'. (Amidon *et al*, 2006).

<sup>3</sup>The term 'econophysics' was coined in 1994 by Harry Eugene Stanley to denote the field of physics dealing with phenomena in economic fluctuations and finance: see Mantegna and Stanley (2000).

<sup>4</sup>Entrepreneurial *motivations* encompass: the capacity to think for oneself; self-confidence; optimism and personal drive; a sense of autonomy, independence and risk-taking; and intense emotions. Entrepreneurial *attributes* include: clarity of leadership; openness and inquisitiveness, stimulating innovation and learning; an ability to create new value or organizational capability; flexibility and the capacity to change; relationship-building skills; and an ability to convince others (employees, individual investors, suppliers and landlords) to share start-up risks.

<sup>5</sup>Moore's 'Law' was adopted after Intel co-founder Gordon Moore wrote in 1965 that '...the number of transistors on a chip would double every 24 months'. See *Electronics* magazine, 19 April 1965

<sup>6</sup>See [http://ecorner.stanford.edu/author/shai\\_agassi](http://ecorner.stanford.edu/author/shai_agassi).

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