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Making creativity: the value of multiple filters in the innovation process

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Abstract: Creativity – often defined as developing something novel that fits its context, and has value – has gained increasing attention within countries and organisations, especially as more leaders see it as a renewable resource. Despite having long been studied as a concept in psychology and management theories, and recently, in neuroscience and brain research, it is often regarded as an intangible concept, resulted from a ‘mysterious process’. This conceptual paper offers an applicable and practicable framework of information process of creativity that is built on previous works relating to creative disciplines and information process as critical components and inputs. The framework suggests opportunity to design empirical investigation into creativity’s causality as well as a discipline of teaching creativity that helps improve creative performance, especially in an entrepreneurial space. We begin with a brief review of the creative process its connection to information processing, propose a tentative framework for integrating the two ideas, and provide examples of how it might work. We close with implications for further practical and theoretical directions for this idea.

Keywords: innovation process; multiple filters; Aha! Moment; serendipity; information processing.

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1 Introduction

The global economy has been shaken by a series of financial market failures, big or small, since mid-1994. It looks like the world would continue to suffer from a low demand period ahead. An increasing attention has since the US subprime mortgage crisis been turning to new capabilities of creating new demand, which would primarily put more pressure on innovative capacity of both developed and developing economies. Once again, the changing capitalism is facing the conundrum of inducing more creative performance in general and innovations, including technologies, in particular.

Fortunately, Schumpeter (1942) – who first coined the now famous term ‘creative destruction’ – unveiled the role and nature of creativity in market economies. That is, when an economy realises its stationary stage, entrepreneurial efforts will introduce new competition, in form of new commodity, new technology, new source of supply, and new type of organisation, which “strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives”. As Greenfield and Strickon (1981) argued, entrepreneurs possess unique characteristics of risk appetite, alertness to new opportunities, and creativity/innovation capacity to turn them into lucrative commercialisation. Later Nonaka (1991) affirms that the most single lasting competitive advantage is knowledge, especially “in an economy where the only certainty is uncertainty”. In light of this, if a company wants to survive and pursue business success then its ‘sole business’ must be ‘continuous innovation’. The continuance of being innovative requires making creativity an applicable and teachable process that this paper is to investigate.

Academic and practitioner interest in organisational creativity has grown in the last two decades (e.g., Runco and Richards, 1997; Napier and Nilsson, 2008), in large part because leaders have begun to see creative outputs as essential for sustainable advantage. As organisations seek novel products, services, processes or business models, the ability to assess information and come up with ideas that can be implemented becomes more critical. The connection, then, between information process and creativity and how they may work together in creating a process for improving outcomes is what this paper will explore.

The paper has five parts. First, we discuss the underlying rationale of this research with emphasis on preliminary assessment of its importance in today's business environment. Second, we review literature on creativity, especially the process of generating and choosing ideas, and its role in organisational pursuit of advantage. Third, we propose a conceptual framework of entrepreneurial information process of creativity and discuss how it could contribute to helping organisations use creativity as a

'productive engine'. Forth, qualitative discussions and some reported empirical evidences are presented to reinforce the bonding of building blocks of the framework. Finally, we close with insights and implications for further practical and theoretical directions.

2 Underlying rationale and critical questions

Creativity and innovation have gained increasing attention within countries and organisations, especially as more leaders see it as a renewable resource. Despite the variations in definitions of creativity, many researchers (e.g., Klein, 1982; John-Steiner, 1997; Runco and Richards, 1997; Sternberg, 1999) agree that creativity is typically characterised by notion of something that is novel or new, fits its context, and has value. Runco and Jaeger (2012, p.2) affirm that "creativity requires both originality and effectiveness". Indeed, those components really do matter. For instance, when an interactive television service, called QUBE, emerged for the US public in the mid 1970s, it was novel, but did not fit the context because people were not ready for it, did not quite understand what to do with it, and thus it had little value beyond being seen as a fun game. Conversely, when Southwest Airlines introduced its new business model of low cost, direct flight service in the USA in 1971, it was novel, fit the context in which oil prices were forcing large airlines to boost prices dramatically, and thus had real value for travellers looking for a good deal.

In addition, creativity has long been studied as a concept in psychology and management (e.g., Runco, 2004; Sternberg, 1999), and more recently in terms of its relationship to neuroscience and brain research (Joseph, 2011). But in practice, creativity is often appreciated 'after the fact', when some concrete outcome or idea emerges, whether as something tangible, in oral or written form or as an action. For too long, as well, managers and or employees have regarded creative outcomes (e.g., products, solutions, process) or performance as the natural outcome of only certain types of people – those who are 'creative' (Unsworth and Clegg, 2010). Furthermore, despite widespread discussion, research and evidence to the contrary (Barczak et al., 2010), many organisational members continue to assume that creativity requires complete work place freedom, that creativity arrives unexpectedly or in a flash rather than after hard work, or that it demands a certain life style, like that of 'a starving artist'.

For instance, many people count Google as among the world's most creative companies. To explain the outstanding performance, they may look to photos or stories about how Google provides a great work environment: free food, playful settings, an informal dress code, an in-house spa and fitness centres. Such explanations may be a result of the firm's success, rather than the drivers that the founders used to come up with Google in 1997. Yet recent research counters the notion that creativity thrives (only) under freedom with no boundaries or that simply having an engaging work environment will generate new ideas. In fact, some argue for the converse, specifically that structure and certain types of discipline matter, and that a willingness to use trial and error and learn from mistakes is fundamental to the process of emerging novel ideas. Inventors epitomise this notion. Well known physicist Michael Faraday conducted a staggering number of experiments – some estimate more than 16,000 (Guilmette, 2012). Thomas Edison is attributed to have said that he did not 'fail' when he was developing new inventions; he just needed to try 1000 times before he got it right (Axelrod, 2008).

Information and the way it spreads thus deserves examination in terms of its role in analysing creativity processes with emphasis on management implications. Every enterprise, from tiny start-ups to multinational companies likely use information for scanning an environment, managing effectively, or employing high-profile business intelligence with a goal of gaining some competitive edge that adds value. A desire to understand the connection between information and creativity better raises two questions:

- 1 What is or would an information-based creativity process look like?
- 2 How might information and creativity factors jointly generate creative outcomes?

Within the creativity literature, the role of information and information processing has received generally less attention, but that is growing. For example, Chiu and Kwan (2010) suggested a process model of creativity by examining cultural impacts on three stages of the way new ideas emerge: selecting, editing and marketing ideas, and acceptance. Information, of course, has often been an instrumental turning point that has dramatically shifted economies dramatically. Gutenberg's printing press in 1436 (Vander Hook, 2009) illustrates this as it triggered changes in 15th century Western Europe from social mobility and education, to science and technology, to the attitude toward the Papacy. In the late 20th and early 21st centuries, the use of the internet generated similar paradigm shifts in the way the economy, social interaction and political engagement occurs, including political shake-up in the world such as the outbreak of the Arab Spring in 2011.

This paper assumes that information comes in various forms. Once collected it needs to be assessed or filtered. In addition, there may be different levels or stages of this assessment or filtering process and that at each stage, there could be an addition to the creative process.

3 Literature review of creative process and information process

This section first provides definitions of creativity and innovation applicable to the following discussions. Scholarly works on creativity then are reviewed at individual and organisational levels. Linkage between entrepreneurship and creativity is also discussed since the former is supposed to provide the latter with favourable environment. Three methods of making creativity based on the three-discipline process introduced by Napier and Nilsson (2008) are also summarised to grasp the basis of a conceptual framework proposed in the next section. A subsection on managing information flows in relation to creativity making then follows in order to help build critical blocks of the proposed process.

3.1 Creativity and innovation

In this paper, creativity and innovation are often interchangeable except where the former is referred to an intangible activity and the latter a specific output. It is hard to describe creativity. [Taylor \(1960\)](#) defines creative thinking with a narrow view toward new products, and suggest that his view does not conflict with the key ideas of novelty and worth. Taylor sees creativity as a complex undertaking, and included many variables, from products, processes, people, tasks, to environment as well as their interaction. Bohm

(1968) even argues that it is impossible to define creativity in words while necessary to be more precise about “What is order? What is structure? What is process? [of making creativity]”. Researchers, therefore, whenever possible, have tried to provide intuitive illustrations of creativity behaviour (Klein, 1982), process (McAdam and Keogh, 2004), and approach to creativity (Udwadia, 1990).

Udwadia (1990) defines innovation as “the successful creation, development and introduction of new products, processes or services” and “the genesis of innovation lies in creativity in functional areas, and across different disciplines”. Thus, innovation is closely related to creativity which is the generation of novel and useful ideas (Amabile et al., 2005).

Kaufmann (2004) distinguishes between reactive and proactive creativity because their difference in style is consistent and methodologically and empirically proven as against the adaptor-innovator theory of creativity. Gilson and Shalley (2004) proposes that team members who perceive their job as one that demands high creativity, high interdependence and shared goals tend to value participative problem-solving and a climate supportive of creativity. As a matter of fact, those creative team members have tendency to spend more time and effort socialising with each other. If such attitudes emerge from an entrepreneurial workplace setting, perhaps they could be extended to other settings, such as in economic development.

Kronfeldner (2009) uses novelty (i.e., original, unexpected) and appropriateness (i.e., useful, adaptive concerning task constraints) in defining creativity. Novelty leads to originality and spontaneity. The former explains why something must be novel in order to be a product of creativity. The latter answers why ‘unexpected’ and ‘surprising’ are needed. Further, Kronfeldner defines originality as a specific double causal independence – learning from others and learning from individual experience. “A potter is creative only if he does not copy the activities of others or an original pot [even the pot was made by himself]”. However, “training in pottery does not make it the case that a trained potter cannot be creative”. The knowledge which the potter accumulated over the years [from others and himself] is necessary for him to be able to come up with the [new] idea as well as allows him to judge it appropriate.

Originality is not the only essential characteristic of creativity. When learning and experience diminish originality, there will still be spontaneity. Kronfeldner argues that creativity comes in degrees. Although a child obtains a lot of information from his teacher, as long as the teacher is not presenting the solution directly, “the child has to be creative to some degree”. The teacher defines the problems and gives the child almost everything he needs but the teacher withholds the answer. “Creativity does not react to orders. It occurs spontaneously, if it occurs at all”.

Glaveanu (2010) defines creativity as capacity to bring about the new, especially the creative product, which is new, useful, appropriate or meaningful. He argues that creative expression is a form of cultural expression and, ultimately, one of the most illustrative forms of cultural participation. He uses Yin and Yang symbols to describe the interdependence of culture and creativity: “Culture is not only a resource but also a directing force”. Therefore, “the ‘richer’ the contact with cultural elements, the more remarkable the creations”. On the other hand, creativity is “the main engine behind cultural change and transformation”.

Chiu and Kwan (2010) also point out that culture has profound impact on real-world knowledge creations. In addition, culture is the key factor that helps explain the complex creativity-culture relationship. Erez and Nouri (2010) examine the influence of cultural,

social and work contexts to creativity of individuals and organisations. Since creativity could be viewed as having one of the two, or both, key components of idea novelty and usefulness, they suggest that depending on what cultural milieu one lives in, the person could have tendency toward one type of creativity or another.

3.2 *Creativity at individual level*

Research on creativity has long tended to focus on individuals (e.g., [John-Steiner, 1997](#); [Runco and Richards, 1997](#); [Runco, 2004](#); [Sternberg, 1999](#)). [Klein \(1982\)](#), for example, conducted a survey on words and phrases that people – ranging from novelists and musicians, to social scientists and high school students – use to define creativity. The result was a diverse set of words and phrases, demonstrating that creativity is a catch all term. Some characteristics and behaviours were similar across groups, however, including the following:

- 1 Ability to maximise options and broaden perceptions of behavioural alternatives.
- 2 Ability to defer judgement, accept all ideas as plausible and eliminate prejudice on all levels.
- 3 Being inconsistent, or “more primitive and more cultured, more destructive and more constructive, crazier and saner than are average people” ([Barron, 1963](#)).
- 4 Ability to seek freedom from conventions and habits
- 5 Being oriented with a focus on not just thinking of good ideas but acting on them.
- 6 Being aware of inner and outer worlds, in terms of where people are, whether they want to be there, where they do want to be, how they are going to get there.
- 7 Being responsible/responsive to his/her needs and to the world.
- 8 Having a positive orientation that increases self-concept and confidence.
- 9 Willing to take risks: Risk avoiding can result in a lack of growth, limited horizons, and a boring daily life.

[Klein \(1982\)](#) offers a three-dimension model for identifying factors comprising individual creative behaviour, including modes of behaviour (subconscious, imagistic, cognitive, and actualising), contents of behaviour (perceiving, affecting, intellecting, and responding), and processes of behaviour (fluency, flexibility, elaboration, and originality).

[Miron et al. \(2004\)](#) show that although critically important to organisation’s innovations, creativity alone does not suffice to achieve innovative performance. Creative people are not necessarily the most innovative ones in terms of performance, partly because innovative behaviours are influenced greatly by the degree of supportiveness that specific organisational culture values exhibit. Work by [Peters \(2009\)](#) helps explain the point by dealing with the so-called ‘economy of passions’ in a close relationship with education and creativity. [Peters \(2009\)](#) confirms that human creativity is the ultimate resource for economic development. However, the ‘personal anarcho-aesthetics’ traits of creativity – believed to have emerged from German idealism and Romanticism – tend to advocate a generally accepted hypothesis that sources of creativity power emerge from deep subconscious processes, involving imaginations, are deeply rooted in personal

passions. They could hardly be directed or controlled by others and even the creative person herself. Properties of such as a person naturally fit well with an opening business settings, where constructive brainstorming, open strategic planning and entrepreneurial risk-taking capability are accepted and encouraged.

Going deeper into the advances of creativity research, McAdam and [Keogh \(2004\)](#) further elaborate on implement ability of creativity and innovation in business conducting. The process model represents a complex mix of elements constituting the so-called 'transitional dynamics' from creativity to innovations.

McAdam and Keogh (2004) also suggest that innovation cannot be seen as obvious even in those highly creative organisations, with talented and creative people. Innovations are not events taking place at separate points in time, but instead should be regarded as outcome of a constant change management process, where creative ideas serve as an important input in the first place only.

However, evidence from Egan (2005) suggests that creative people belong to a rare breed, and thus innovations are the scarce ultimate resources, which explain why firms have to spend a lot of money to acquire. There is evidence confirming the proposition that creativity tends to be enhanced with positive role-modelling, non-controlling feedback behaviour, and supported by people's perceptions that creativity is valued. In short, when creativity and innovations become a strategic goal, they could at the same time become values and resources in appropriate settings.

The work of McAdam and Keogh (2004) can be combined with West (2002) to show conditions for successful implementation of innovations from initial creative ideas, namely: Characteristics of task, knowledge and skill diversity, external demands, integrating group processes and intragroup safety. In West's examination, although diversity of knowledge and skills is a powerful predictor of innovation, processes employed by groups and core competency are factors that determine the success of innovation.

[Barczak et al. \(2010\)](#) survey a group of 82 student teams at a large US university and yield findings suggesting that team emotional intelligence promotes team trust. Trust, in turn, fosters a collaborative culture which enhances the creativity of the team.

3.3 Creativity at organisational level

While many researchers still focus on creativity at the individual level, in the last two decades some have moved toward how organisations can develop and use it ([Amabile, 1996](#); [Amabile and Conti, 1999](#); [Degraff and Lawrence, 2002](#); [Napier and Nilsson, 2008](#); [Paulus and Nijstad, 2003](#); [Unsworth, 2001](#)). Creativity increasingly has been considered a resource, potentially useful even beyond organisational competitiveness to include countries ([Napier et al., 2006](#)) and communities as well ([Florida, 2002, 2005](#); [Kao, 2007](#)).

Creative performance has been elusive due to the common confusion of adaption and origination concepts, and that is why Udwardia (1990) focuses on '3P' aspects of creativity, namely process, person and product. Udwardia explicitly states creativity as the production of novel/original ideas of useful value, which shows the tendency of associating creativity with innovation capability.

In Udwardia's view, creativity can be regarded as a basic element in a model of generating innovations in a broader macro-level consideration, where one can see contributions of each aspect of creativity to the innovation process. Udwardia also notes

the followings: “The blocks shown above are by no means meant to be exhaustive and pertinent to all situation. They are merely indicative”.

Udwadia’s innovation process ties to the idea of Lumpkin and Dess’s (1996) about establishing connection between the entrepreneurial orientation (EO) to firm-level performance. They link the EO to firm performance through clarifying its construct and propose different dimensions of the EO, namely autonomy, innovativeness, risk taking, proactiveness, and competitive aggressiveness. A typical EO construct is one that represents a new venture, but not limited to that. An EO can serve as a source of competitive advantage not only for an entrepreneurial firm, but also established businesses. Lumpkin and Dess suggest that no universal relationship should be articulated between an EO and firm’s performance, and such relationship has to be observed in specific context. Also the above-mentioned EO dimensions are not equally influential across phases and places of business, but vary in different contexts.

De Dreu (2010) draws on a representation of $C(reativity) = N(ovelty) \times U(sefulness)$ to postulate that for creativity to take place, both novelty and usefulness are needed. More interesting, Dreu’s work remarks that culture may influence the assessment of novelty, of usefulness, or both. The reasons for that critical role by culture are because “*individuals have strong incentives to stick to the status quo, to engage in habituated action, to follow the well-trodden path, and to conform to the views and perspectives of the majority*”. Therefore, it is logical that businesses have little choice but to nurture factors that could exert their own ‘exogenous influences’ on innovative capacity of an organisation, namely organisational structures, group pressures and normative social influences relevant to cultural backgrounds of individuals.

Unsworth and Clegg (2010) examine the motivation for people to undertake creative actions at work: “... General work motivation, creativity requirements, cultural support for creativity, time resources, and autonomy were all used as cues in deciding whether undertaking creative action would be worthwhile via judgemental processes of expectancy and instrumentality”. This finding can be seen as a bold step toward practicality and usability of creative forces at work, from the previous seminal work by [Unsworth \(2001\)](#) ‘Unpacking Creativity’. In [Unsworth \(2001\)](#), the assumption of creativity as a homogenous construct is challenged by proposing dimensions of ‘Why engage in creativity?’ and ‘What is the initial state of the trigger?’ to construct a matrix of creativity types, where main types of creativity provided – namely responsive, expected, contributory, and proactive – gives rise to a re-consideration of practicality of creativity in workplace.

Bissola and Imperatori (2011) show that creativity is not only about creative genius. Enhancing creativity requires, obviously, creative skills, and also team dynamics and organisational solutions. An organisation’s collective performance that produces creativity and innovations should be an interaction between the above key elements.

3.4 Creativity and entrepreneurship

Scholars, like Amabile (1996), suggest that entrepreneurship is typically defined in terms of innovations but still others, including Kirzner (1973), defined them in terms of being alert to an unexploited or new opportunity in the marketplace, and have the kind of risk appetite that allows them to go ahead with that venture pursuit.

When Day (1995) discusses entrepreneurship and innovation, he stresses the importance of ‘economic creation’ to managerial systems, at the heart of which are the

elements of invention, innovation and diffusion. Both inventors and entrepreneurs have to imagine new things that do not exist, and also formulate operational steps, which enable them to successfully implement creative ideas and produce useful innovations. Their imagination, innovation and imitation transform societies. The co-existence of management, entrepreneurship and act of imitation proves the bounded rationality on one of the key functions of any economic system, which is an economical allocation of resources.

Day (1995) also argues that the logic of necessity of entrepreneurship rests with rigidity created within established corporations, and also social institution and authorities, by applying rules, and requesting people to 'obey the rules'. Economising the increasingly complex systems naturally leads to adoption of the so-called 'standard operating procedures' that institutionalise habit and inertia, thus add inflexibility and reduce responsiveness. As a consequence, the creativity exercise is further confined to a somewhat rational choices existing in a limited scope. Thus, by building inertia to stabilise an enterprise, rules at the same time hamper creative and inventive acts, and cause the scarcity of imagination, hence intelligence.

Entrepreneurship is a useful apparatus for liberating creative activities from rigid bonds of overdeveloped infrastructure, the same way capitalism did to the feudal system. Through entrepreneurial endeavours, entrepreneurs can stimulate a radical change in invention and innovation, and simultaneously destabilise forms and substance of an existing economic system, pushing it to a more radical transformation. Further, entrepreneurial efforts could only work effectively in an environment where the market mechanism exists and its price system helps coordinate economic activities in ways so that existing market participants can reasonably attain their commercial benefits above their costs. When this happens, prospective entrepreneurs should be able to enter likely profitable ventures. Of course, economic competition should drive loss-making (i.e., inefficient and incapable) entities out of the market, too. The takeover of resources and profits in the market game typically exemplifies entrepreneurial pressures caused by asymmetric rewards and punishments in a market system.

The turn of New Millennium has proven to show also a remarkable turn to a natural nexus between creativity/innovation and entrepreneurship (e.g., [Brown et al., 2001](#); [Kaufmann, 2004](#); [Gilson and Shalley, 2004](#); [Miron et al., 2004](#); [McAdam and Keogh, 2004](#)). [Brown et al. 2001](#)) emphasise the need for empirically verifiable strategies to further advance the proposition stating that "Entrepreneurial management, defined as a set of opportunity-based management practices, can help firms remain vital and contribute to firm and societal level value creation". Practically, their operationalising paradigm is not ready for an empirical implementation. Their contribution is in pointing out issues in translating theoretical propositions and conceptual frameworks into more practical insights – and perhaps preferably applicable to managers, which bolsters the need of empirical evidence toward practicality in management settings and real-world business operations.

Changes that entrepreneurship brings about do not stop with influences within the startup and venture circles, but trigger a contagion to the community of well established corporations, including MNCs, through the notion of 'international entrepreneurship' reported by [McDougall and Oviatt \(2000\)](#). In addition, [Ahuja and Lampert \(2001\)](#) deal with such important and highly practical issues of whether and how established corporations could make breakthrough innovations occur, by relying on the concept of 'entrepreneurial corporation.' When successful firms re-establish the entrepreneurial

spirit, thus enhancing creativity capability, they work hard to avoid the so-called familiarity trap, maturity trap and propinquity trap. These traps have been along the earlier successes of accomplished businesses and inhibit the activating of entrepreneurship inside corporations, thus impede creative breakthroughs from happening, when and where they are most needed.

Historically cultural differences play a significant role in defining the deviation of progress and prosperity between the East and the West. If [Birzer \(1999\)](#) tells about the entrepreneurial spirit embedded in even system value of both society and Government of the USA, [Worris and Leung \(2010\)](#) showcase that differences in creativity between the East and the West do exist and could be examined based on cultural differences and society's stress more on novelty/originality or usefulness/appropriateness when dealing with creativity matter.

Social norms and actual contexts also help predict cultural differences. Looking back upon the late 19 century's colonisation of East Asian countries (e.g., China, Vietnam, and South Korea), lower ranking of entrepreneurial classes in the societies exhibit a key difference, which hinders entrepreneurial undertaking and impedes innovations, even adaptation of existing innovations, from occurring. Vibrant transition taking place in then more powerful East Asian economies, such as Japan, in fact benefits from an ideological change of the elite circle, whose senior members recognised values of entrepreneurship and tried to institutionalise a civil society where innovations and creative performance were desired ([Isaksen and Ekvall, 2010](#)).

At a societal level, [Bohm \(1968\)](#) raises the question of what may prevent the vast majority of people in a country from being creative: "The creative possibilities of the mind are generally dormant" as a result of a widespread confusion between 'the creative' and 'the mechanical.' This confusion is so persistent and deep that one could hardly perceive one's lack of creativity. Awakening that entrepreneurial power requires creative performance of entrepreneurs.

Innovations at private entrepreneurship firms as shown in history of China and Vietnam occur only in the right environment, where private ownership of properties is fully recognised and markets exist to allow for real competition ([McMillan and Woodruff, 2002](#)). Going back to the early days of private entrepreneurship in Vietnam's economic reform, right in the critical phase of crisis from 1988 to 1992 – indeed on the verge of a devastating collapse – private-sector employment, then mostly entrepreneurial firms in micro-scale, added 6.4 million jobs to the economy (jumping from 3.8 to 10.2 million), while the state sector shed 1.1 million jobs (from 4.1 to 3.0 million), and state-managed cooperative sector slashed 2.1 million jobs (from 20.7 to 18.6 million). In the subsequent period from 1992 to 1995, 2.4 million jobs were further created by Vietnamese private SMEs.

With respect of job insecurity, we can learn some useful insights from [Probst et al. \(2007\)](#) who look at productivity, counter productivity and creativity through the lens of 'job insecurity' to conclude that job insecurity can possibly hamper personnel's creative power. However, since insecurity may have some moderately beneficial effects on productivity, the balancing between negative effect on creativity and somewhat positive on productivity should be relevant to a business operation, especially in entrepreneurial stage of growth and in turbulent economic changes.

This transition tends to lead to the so-called knowledge society, which should inherit from the idea of [Murphy \(2005\)](#) that the arts and the sciences serve to be the basis for the notion of 'Knowledge Capitalism', where the role of creativity and intelligence is

essential to modes of production built upon intellectual capital. Entrepreneurs have to play an important role, following their innovations as major contribution and due to their boundless influence, as the entrepreneurial spirit is not limited in the form of startup ventures. To this end, Stevenson and Jarillo (1990) emphasise the management aspect of entrepreneurship that goes beyond the meaning of corporate venturing. By nature, it represents the quest for growth through innovations, with both technological and managerial inventions being a means. In light of this whether the pursuit of a new opportunity for growth is done through a corporate form or not does not matter much, but the path to the end itself already constitutes the core of entrepreneurship.

3.5 The three-discipline creativity process

Napier and Nilsson first introduced a three-discipline method of creativity in 2008, employing

- 1 out-of-discipline insights
- 2 best expertise within the discipline
- 3 a disciplined process of putting together methodology and inputs in a consistent manner to strive for creative performance and innovations.

Since this is a process, nesting activities (including thinking) in a disciplined and consistent way, it relies mostly on all types of information, and a system of evaluation and measurement for both inputs and outputs of the system. Disciplinary employment of the method resulted in two other methods of creativity – insight or Aha! Moment ([Napier et al., 2009](#); [Napier, 2010](#)) and serendipity ([Napier and Vuong, 2013](#)).

3.5.1 The 3D method of creativity

Napier and Nilsson (2008) describe three disciplines (i.e., 3D creativity) as critical for implementation of creativity. They include ‘out of discipline’ thinking, ‘within discipline’ expertise, and a ‘disciplined process’.

First, out of discipline thinking involves looking beyond a discipline or field for ideas. Out-of-discipline thinkers absorb information from sources beyond their normal boundaries and fields and then seek to understand how the ideas might apply in their situation.

Second, within discipline expertise focuses on how individuals become the best in their fields and then, with that fundamental expertise base, move onto thinking more creatively. The notion is that when the best in a field work (or compete) together, they can learn and improve faster from each other, allowing them to come up with new ideas in the process.

Third, a disciplined process means that organisations use routine and structure to allow more creativity. The process also combines the two above-mentioned disciplines.

The 3D method suggests a consistent way of pursuing creative performance. That is, as long as one – individual or organisation – patiently and strictly employs the three disciplines a novel and valuable outcome is highly likely to occur.

3.5.2 *Insight or Aha! Moments*

Insight or ‘Aha! Moments’ is typically defined as the *sudden awareness of a problem solution or understanding of some idea* (e.g., learning a language, realising a life lesson). The process, which can be mapped, generally consists of several stages (Napier, 2010; Wallas, 1926).

First, an individual (or in the case of a group moving toward a ‘collective Aha! Moment’) gathers or receives overwhelming amounts of information on the topic of interest or problem to be solved. This ‘sort stage’ beings, then, with a sense of too much dispersed and unconnected information, and then moves into a period which involves chunking and sorting the information into understandable categories. At this point an insight – ‘connecting the dots’ – may occur but if it does not, the next phase should begin.

During the ‘spark stage’, individuals and groups can use several techniques to generate the sudden awareness or understanding. Such techniques include, for example, looking at a problem ‘in reverse’, or from an unusual angle, bringing together ideas from very different domains, and allowing for ‘simmering’ or some time to pass when the ‘unseen mind’ works subconsciously on the problem.

Once insight occurs, a final ‘checking stage’ to verify the result is critical to be sure that the ‘Aha! Moment’ lesson can be generalised beyond a single incident. Aha! Moment method suggests that solution to a tough and long-standing problem will finally arrive if one persistently employs the three disciplines.

3.5.3 *Serendipity*

The concept of serendipity is similar to insight in that it typically involves integrating sometimes diverse ideas but there are distinct differences. Typical characteristics that emerge in the definition of serendipity are:

- 1 unsought, unexpected, unintentional, unanticipated event or information
- 2 something out of the ordinary, surprising, anomalous, inconsistent with existing thought, findings or theory
- 3 an alertness or capability to notice what others do not, to recognise, to consider, and to connect previously disparate or discreet pieces of information to solve a problem or find an opportunity.

Napier and Vuong (2013) define serendipity as an ability (that can be developed) to *notice, evaluate, and take advantage of unexpected information better or faster than competitors*. An important distinction is that information appears unexpectedly and only within the context of a problem or opportunity does it come together to create something of value. Further, the ability to notice the information is also key. Unexpected information appears regularly at the doorstep of individuals and organisations, but if it goes unnoticed, it never has the chance to be leveraged. Thus, the ability to notice, the ability to evaluate, and the ability to turn that information into something of value are key to the process.

Serendipity method suggests one – individual or organisation – to develop ability to absorb and sort large amounts of information, spark insight and check for reliability, which is as important as observing useful – but unexpected and unexploited –

information and insights, then evaluate them to decide whether an emergent opportunity should be considered worth pursuing.

3.6 Information and information processing in relation to creativity

Knowledge sources – consisting of knowledge stocks and information flows – are instrumental to innovative activities according to a number of research streams (e.g. [Allen, 1971](#); [Cohen and Levinthal, 1990](#); [Henard and Szymanski, 2001](#); [March, 1991](#); [Moorman and Miner, 1997](#); [Starbuck, 1992](#)). The two are both inputs to the processes of organisational learning that acquire information, then disseminate, interpret, utilise, and store them.

They exhibit, however, three key differences. First, information is ‘data that give meaning by reducing ambiguity, equivocality, or uncertainty’ whereas knowledge involves ‘more complex products of learning, such as interpretations of information, beliefs about cause-and-effect relationships or more generally know-how’ [[Huber, \(1991\), p.89](#)]. If organisational learning is to occur, information should be converted into knowledge following the learning processes and partly stored in organisational memory ([Akgün et al., 2003](#); [Day, 1994](#)). Albert Second, though both form an input to the learning process, knowledge stocks carry assumptions about how the world around and within a firm works ([Hedberg, 1981](#)), thus, they are imbued with legitimacy ([Walsh and Ungston, 1991](#)). But information is open to interpretation typically conditioned by these ‘worldviews’ – as [Hedberg \(1981\)](#) names the assumptions. The third difference is tied to information on market development. Specifically, information flows refer to recent or ongoing issues in the market while memory (a sort of knowledge stocks) describes past experience in general ([Kyriakopoulos and De Ruyter, 2004](#)).

As Albert Einstein reminds that ‘information is not knowledge’ the former transforms into the latter by proving its value. Such transformation is consider a creativity making process that generates useful and appropriate understanding.

The work of [Tarafdar and Gordon \(2007\)](#) focuses on two sources of market information flows: internal and external. The distinction between the two sources is a matter relative to the information receivers ([Kyriakopoulos and De Ruyter, 2004](#)). Internal information flow occurs when a project team relies on market information from internal sources in the focal firm including internal experts, concurrent projects, R&D department or sales department ([Huber, 1991](#)). External information flow refers to the extent to which the project team relies directly on external sources involving customers or lead users ([Von Hippel, 1988](#)), supply chain partners ([Day, 1994](#)), alliances ([Inkpen and Dinur, 1998](#)), and outside experts ([Huber, 1991](#)).

Gathering and using information during the innovation process are equally important according to the information view of product innovation (e.g., [Allen, 1971](#); [Ancona and Caldwell, 1992](#); [Moorman, 1995](#)) and research on adoption of innovations ([Rogers, 1983](#)). [Tarafdar and Gordon \(2007\)](#) suggest that information system (IS) competencies in knowledge management, collaboration, project management, ambidexterity, IT/innovation governance and business-IS linkages affect the conception, development and implementation of innovation processes.

Recognising the importance of information, many have devoted to investigate ways to manage it and relationship between information flow management and innovation/creativity, namely [Choo \(1996\)](#), [Teece \(1996\)](#), [Shneiderman \(2000\)](#), [Wilson \(2002\)](#),

Chapman et al. (2003), Gloet and Terziovski (2004), Batallas and Yassine (2006), and De Dreu (2007).

Experiments illustrate that controlling over the information flow shows a substantial impact on consumers' ability to integrate, remember, and understanding inputs to their judgements (Ariely, 2000). The ambition to support evolutionary creativity led to the four-phase generator of excellence: collect, relate, create, and donate (Shneiderman, 2000). Each consists of primary activities and is reversible to the previous phase. Integrating the phases and their activities is challenging but such combination could produce an environment that greatly facilitates creativity.

At group level, Sosa (2000) suggests that workgroups with higher levels of communication are more successful in the creativity process of innovation. Task-dependencies between groups must be recognised beforehand in order to stimulate information exchange among them. De Dreu (2007) also points out that perceived cooperative outcome interdependence increases team effectiveness only when team members engage in systematic information processing. In view of the fact that product development deals with information exchange within and between groups, then some teams are dominant in terms of information control and flow. Therefore, identification of high central teams, grouping them as information leader team and assigning them specific roles as system integrators and information diffusers for potential innovation can greatly enhance product development information exchange (Batallas and Yassine, 2006).

In addition, Teigland and Wasko (2003) stress that organisations concerned with knowledge management and creative solutions should focus on balancing knowledge integration structures that support efficiency with flexibility, emphasising boundary spanning and informal information trading through both personal and electronic networks. Nevertheless, depending on the type of experiences and sources of information flows, firms could develop profitable and creative products (Kyriakopoulos and De Ruyter, 2004).

In the context of manufacturing firms, a knowledge management model based on IT and human resource management (HRM) focuses is a reliable and valid instrument for measuring and predicting the relationship between knowledge management practices and innovation performance (Gloet and Terziovski, 2004). Also this study shows a significant and positive relationship between knowledge management practices based on a combination of IT/HRM and innovative performance. However, there is a significant and negative relationship between elements of IT focus on technological advancement (e-commerce) and innovative performance. On the other hand, regarding service firms, external information flows are a significant factor of innovation. But innovation *per se* only benefits the firm if it manifests superior value in the customer-driven marketplace and service innovation results only when a firm is able to focus its entire energies to think on behalf of the customer (Kandampully, 2002; Chapman et al., 2003).

A model of a 'Knowing Organisation', in which information processing is at the heart of effective integration of sense-making, knowledge creation, and decision making demonstrates that such organisation benefits from both external and internal knowledge sources, thus, possesses "a special advantage, allowing it to maneuvers with intelligence, creativity, and occasionally, cunning" (Choo, 1996). It is also worth noting that firm organisation is not the only determinant of the rate and direction of innovation. In fact, market structure, firm boundaries (the level of integration), the structure of financial markets, and formal and informal organisational structures must be recognised as major determinants (Teece, 1996).

The following section proposes that when seeking useful insights, flows of info – including data, information, and primitive insight – should go through a filtering process that combines creativity making disciplines, understanding and expertise.

4 A conceptual framework of entrepreneurial information process of creativity

This section is to construct a conceptual framework of process of creativity. First, random information goes through a filter where the banks of knowledge, experience, skills, a desire for seeking insight, and the three disciplines [introduced by Napier and Nilsson (2008)] are employed to evaluate, connect, compare data, information, even primitive insight in order to produce creative quanta of useful insights. Then, the quanta are consistently absorbed by an integrated process of three methods of creativity – i.e., 3D, Aha! Moment, and serendipity – into innovations of products, services, and processes that sharpen competitive edge and improve productivity. Entrepreneurship nurtures the circulatory process by desires to success and become self-motivated and self-reliant as well as risk-taking.

4.1 The ‘creative quantum’

Neuroscience studies suggest that the brain can absorb and process several types of input, especially through the senses – sight, hearing, taste, smell, and touch. Information is then compared to existing knowledge in a ‘permanent bank’ of understanding and experience. The brain evaluates the information, connects separate pieces of info for future response or reaction – which is also affected by surrounded social environment. The speed and quality of information ‘digestion’ depend on not only the size of the permanent bank (understanding and experience) but also on what might be called a ‘soft bank’ of skills (Purves, 2010).

Figure 1 illustrates the process more conceptually in terms of the inputs of information and filtering process. Several ‘steps’ exist in this initial processing and filtering procedure within an enterprise’s management IS. First, information is collected and contributed in by clients, staff members, or suppliers, and is then stored in the hardware or the ‘permanent bank’. In a firm, this would be a normal server, which authorised people access to find needed information for making decisions. Analytical software (the ‘soft bank’) helps them gain insights more efficiently. The expectation is that when the filter is the conceptual ideas of the three disciplines (Napier and Nilsson, 2008), creative outcomes may come more readily.

To support the creative process, information and the way it is filtered or processed, organisations and individuals could receive and process at least three types of input into the creativity process. They are:

- 1 data or quantifiable facts
- 2 information, or qualitative evidence, events or anecdotes that are less quantifiable and perhaps less tangible

- 3 basic or ‘primitive’ insights, or initial connections drawn between or from the first two types, which can result in new bit of knowledge that completes some understanding or solution to a problem.

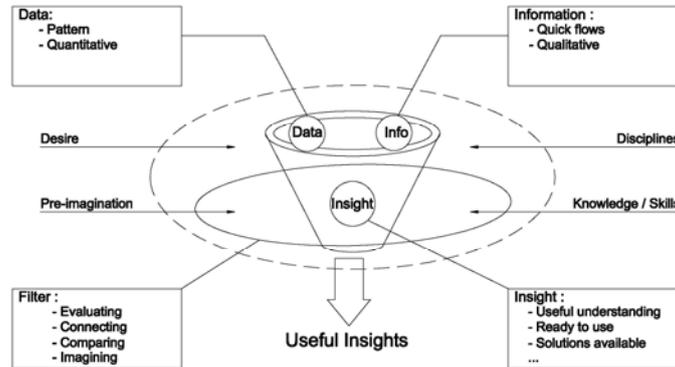
Such primitive insights are useful in understanding but just create marginal or incremental knowledge or adjustment.

In Figure 1, inputs (data, information, and primitive insight) enter the organisational members randomly and equally but are not digested in the same way. Only self-motivated person whose desire is to success and become self-reliant, turns the radar on. For instance, a news of corporate tax adjustment vibrates an accountant who is willing to improve the corporation’s tax shield while just being ignored by his colleague totally focusing on making correct accounting records.

All sorts of knowledge, experience, skills, and disciplines help one digest the inputs faster and better. A legal counsel, who is knowledgeable about judicial system, may classify a tax adjustment proposed by an accounting expert as possibility in future. A manager, who has experienced the experts those are highly appreciated by lawmakers, may consider a higher chance that the tax adjustment will be legally introduced if it is proposed by an influential name. An expert opinion is regarded as a primitive insight. A Microsoft Excel-proficient financial analyst may figure out how much the adjustment affects the corporation’s P&L accounts.

In an ideal situation, the vibrated accountant looks out of his discipline, then talks with the counsel, the manager, and the analyst. When the dots are connected by a disciplined routine for noticing, assessing, seeking opinions, analysing and double checking, it is expected that the corporation will enjoy handsome profits resulted from an innovative process of accounting.

Figure 1 Filtering information for useful insights



When the disciplined procedure (illustrated in Figure 1) filters information and produces useful insights – for instance, an innovation of accounting process – a ‘creative quantum’ is considered generated. It is likely that the more creative quanta are generated, an organisation has more inputs for its later filtering process aiming at making creative performance.

The term ‘creative quantum’ is borrowed from quantum theory of physics that represents main ideas as follows:¹

- 1 Energy is not continuous, but comes in small but discrete units.

- 2 The elementary particles behave both like particles *and* like waves.
- 3 The movement of these particles is inherently random.
- 4 It is *physically impossible* to know both the position and the momentum of a particle at the same time. The more precisely one is known, the less precise the measurement of the other is.

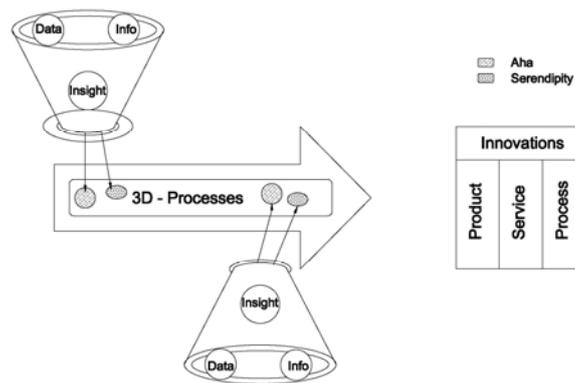
In light of the theory, useful insights are regarded as energy for making creativity. Such insights arrive neither continuously nor regularly. One hardly knows where the right insight – that helps in solving a critical problem, for instance – is and when it comes. The problem solver is just likely certain that it follows patiently practicing the above-proposed information filtering procedure. People – with various personal characteristics, levels of understanding, experience, and skill – have their own ways of perceiving the ‘energy of creativity’ and transforming the energy into idea, response, and action in specific social context.

4.2 *A conceptual design for creativity process*

To better appreciating the role of information in a typical creativity process, we propose an initial set of factors or major blocks that link information and creativity:

- a an input (data/information/primitive insight; each singleton is called a ‘creative quantum’) block
- b a creativity processing block
- c an innovation outcomes block, as shown in Figure 2.

Figure 2 A conceptual design for creativity process



The input block, which is comprised of informational creative quanta together with the relevant ‘filtration system’, helps one spot and select useful insights as they engage in a disciplined process of creativity. The filtering function also helps in sorting input and

identifying (and tossing) ‘garbage’ so that the system will not have to expend energy for ‘waste treatment’. Input, consisting of qualitative fast-moving information, data and primitive insights, flows into a main processing system, which incorporates several aspects that support a creative process.

A disciplined creative process includes reviewing/generating/testing and implementing ideas. Using these factors, the process plays an integrating role, by bringing together inputs and a set of techniques and methods to generate creative outcomes and innovations. For a disciplined creative process to be a permanent part of any management system, an organisation needs to have an innovative, supportive culture to promote useful insights, and a way of identifying and using best practices. Thus, creativity, when pursued in a disciplined way, comprises activities that include finding useful information, data and insights to processing them in a systematic manner so they become significant inputs for key decisions to evaluating them in terms of whether they have the newness and added value of creative outputs.

Part of the disciplined process includes encouraging and taking advantage of both Aha! Moment and serendipity, which Figure 7 tries to incorporate as well. Insight or Aha! Moment is sudden awareness or understanding, involves gathering, absorbing and sorting information before using common techniques to spark new ideas, and then validating the idea to see if it is generalisable (Berkun, 2007; Napier, 2010; Wallas, 1926). Serendipity (Napier and Vuong, 2013; Runco, 2004) is similar except that the information is unanticipated. Because of not expecting the information, the receiving agent may not take advantage of it. The person who is open and recognises possible benefits in unexpected information, then, can perhaps tap and use it to her company’s advantage.

In exploratory studies in Vietnam that bring national culture and business stage come into play (Napier et al., 2012; Vuong et al., 2013a), the three factors – creativity, culture and business stage of development – appear to be related. Of the elements relating to creativity, it appears that having a disciplined process is important for business organisations in the early ‘entrepreneurial phase’.

Perhaps unexpectedly, it appears that serendipity can represent a useful way to capture or observe unexpected and often unexploited inputs (i.e., information, data and primitive insights). An open manager or entrepreneur spots information, relates it to her situation or problems, evaluates its usefulness (often in terms of an opportunity) before deciding to take advantage of it.

During the process of a typical Aha! Moment, a manager absorbs and sorts what might seem like an overwhelming amount of input, and then uses simple techniques to spark new ideas (e.g., connecting odd dots, looking at an idea in reverse), before validating the idea to see if it is generalisable.

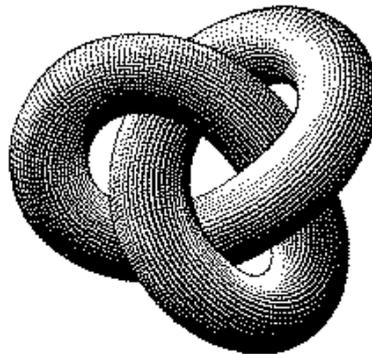
To evaluate the inputs and measure the innovativeness of an output, the three-discipline creativity process (Napier and Nilsson, 2008) may employ critically important ‘mathematical’ ideas such as: differences (good vs. bad, small vs. big, old vs. new, and so on), limits (how far the process can go toward the ultimate end), and relationships between opportunities to spot, methods to be developed, and outcome to be generated.

Information and information processing play a pivotal role in all three methods and is a natural connection among these methods, especially when the shared goal is innovation. Each of the three methods of creativity has a unique strength, thus it makes sense to use

all. Serendipity, on the one hand, demands an ability to spot unexpected information and then tap that for advantage; it may not, however, be enough for making consistent and substantial innovations. The Aha! Moment approach, conversely, could be useful for solving a particular problem, but also may not be the best approach for consistent innovation if it focuses solely on solving immediate or smaller problems. The 3D process, though, builds a unified system for taking into account production opportunities, methods and solutions, and disciplines to make insights and related effort to succeed the production process until the innovative outcome.

In Figure 2, the three methods are shown as separate elements of a system, but in reality, separating these three is almost impossible as they are so seamlessly and closely connected. A better view about their relationship may be illustrated in a trefoil knot in Figure 3, although degree of reliance on each method could vary between organisations or industries or timing.

Figure 3 Trefoil knot



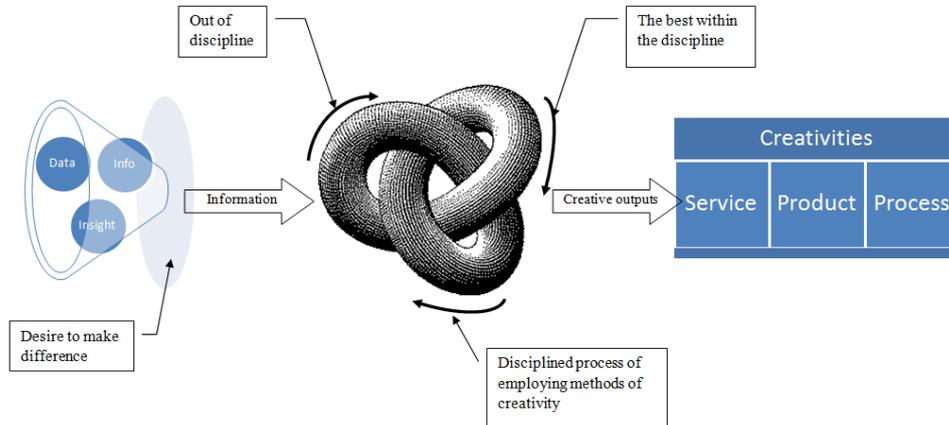
Source: Adapted from [Courant et al. \(1996\)](#)

In fact, information, data and insights can be regarded as forming the so-called ‘creative quantum’ that should travel to processors (using the creativity methods of serendipity, Aha! and 3D) in discrete (not continuous) packets, in diverse forms (e.g., a dream can give a good hint for a problem-solving process), and unexpected timing. Without a real discipline in place and performs consistently, serendipity and Aha! Moment, perhaps, hardly fully employ the value of ‘creative quanta’ to produce genuine creativity and innovations.

4.3 A simplified diagram of 3D information process of creativity

Considering the 3D process a generalised methods of creativity – perhaps, consisting of both Aha! Moment and serendipity – a simplified 3D information process of creativity is presented in Figure 4.

Figure 4 Diagram of 3D information process of creativity (see online version for colours)



Given their desires to make difference, creativity pursuers (individuals and institutions) typically first seek information. As inputs arrive, the process activates simultaneously three disciplines of creativity proposed by Napier and Nilsson (2008). As mentioned above, the disciplines are

- 1 being the best expertise within the discipline in order to identify useful insights and or ‘primitive solutions’ available
- 2 connecting the best expertise out of the discipline to work out a somewhat (near) optimal solution
- 3 strictly following disciplined process of permanently employing methods of creativity until innovations arrive.

Although one discipline often prevails in a creative outcome it is impossible to separate the information process into an order of disciplines, i.e.,

- 1 is followed by
- 2 then by
- 3 or different pairs of disciplines, i.e., (1) and (2).

Here an analogy to the theory of knots is of help (Courant et al., 1996). Flows of information continuously enter the process. Discipline (1) helps spot insightful information or assess which input is already an insight. Discipline (2) helps connect separate insights logically/optimally to work out a solution. At its most basic, more than two insights are needed to connect a line and the more insights/dots we have the better logics and connections are possible. Therefore, discipline (3) is needed to produce the insightful dots. Connecting the dots is also trial-and-error efforts. The discipline of employing methods of creativity is everywhere. In light of this, creativity, which is often perceived as a qualitative concept, can be measured by popular algebraic difference and/or standard error.

5 Qualitative discussions and empirical evidences

It is hard to notice in-process creativity. That explains why creative outcomes are lately perceived in tangible forms of written or spoken ideas, presented products, and introduced services as well as very often come with surprise. While the conceptual framework proposed in the previous section may intuitively uncover the process of making creativity, the following qualitative discussions and empirical evidences are expected to help better understand the framework as well as reinforce its building blocks.

5.1 3D process of creativity that works

A recent example comes from a Vietnamese firm that provided the country's economic insights and business advices. To differentiate from rivals, the research team of Hanoi-based DHVP research follows a disciplined process.

First, the team scans news from public media worldwide to identify possibly useful information, grasps the main points of those articles, and then creates very targeted and concise syntheses and analysis. The result may consist of a few sentences or a paragraph. To use the analogy, the original news article would be considered qualitative information (e.g., description of consumer preference) or data (e.g., GDP figure) or primitive insight (e.g., an expert opinion).

For example, a source article may report on a conference that seeks solutions to curb inflation in Vietnam and closes with no clear conclusion; the article incorporates opinions from many participants and thus would be considered qualitative information input. The team's conclusion would report that "following many discussions, the conference reached no solutions". A second source article might include 'data', in terms of numerical or quantitative information. For instance, perhaps during the same above-mentioned conference, an expert mentions the increasing pace of prices over a 60-month period. It would report a series of CPI data and mention that the 24th month (of the 60 month period) had the highest CPI. These initial two summary reports represent primitive or basic insights that form the 'dots' for subsequent analysis.

In the next job is to 'connect the dots' – the insights from two articles – as a way to generate more useful insights that business readers could use. In this case, the team would make a connection between the two articles and report: "Although the current CPI is approaching its peak of the 24th month in the previous 90, experts are still fighting each other and there is no solution". This would suggest to businesspeople what they may have feared: inflation is rising and yet, no decisive solution is likely in the near term; as a result, the businesspeople need to find ways to protect and hedge against future inflation dangers. A creative quantum is generated.

On a daily basis, the team produces and collects numerous 'creative quanta' which are critical elements for its weekly reports on geopolitics provided to subscribed clients. Such routines help the firm secure the brand of being a reliable source of market insight and analysis, even to international media such as *Wall Street Journal* and Stratfor Global Intelligence. To keep it up, the firm continues to enlarge its storage of useful insights, networks of contacts, which in turn enable it to be able to serve ad hoc requests from clients.

5.2 *Aha! Moment is when... a long-standing problem is solved*

In another case, attempts to place separated dots in a logical order finally arrive at an Aha! Moment – the sudden awareness of a problem solution or understanding of some idea (Napier, 2010). The discipline of connecting the dots shows its value. However, before the dots are connected, discipline (1) should be employed to make the dot appeared. The first connection may be not the most reasonable. So is the second, the third and the followings. This is a trial and error process. Then the handsome solution is badly in need of a discipline of employing methods of creativity.

When Mallaby uncovered the mystery of hedge funds in *More Money Than God* his discussion of first hedge funds revealed that the ‘godfather’ of the industry, Alfred Winslow Jones (1900–1989), exemplified some of the creative discipline aspects this paper has described. Jones did many out-of-the-box actions while building success on ‘connecting separate dots’: from spotting good stocks, to collecting information on them and managing his portfolio, to privately raising funds, to designing performance-based profit sharing schemes (Mallaby, 2010). Jones’s example offers an illustration of Figure 4.

First, Jones had a desire to make a difference. He changed the way of thinking about hedge funds in 1949 when the job of most fund managers was to ‘conserve capital, not to grow it’. To this end, fund managers were conservative trustees. Jones was not. He made handsome profits from hedging financial techniques.

Before being a financier, Jones was America’s vice-consul to Berlin, a member of a secret Leninist Organization against Hitler, an alleged participant in US intelligence operations, a sociologist, a Fortune magazine journalist, and a failed magazine owner. In his forties, his motivation to join the industry was to money to support his family (wife and two children) in expensive New York City.

Jones explained his investment techniques in a 1961 prospectus sent privately to outside partners. Essentially, he used both leverage and short-selling for hedging his fund. Whereas an ordinary fund manager split US\$100,000 80% to 20% (\$80,000 into blue chip best stocks and \$20,000 into safe bonds), Jones acted differently. He raised and borrowed a total of \$200,000, then bought \$130,000 good stocks and put \$70,000 into short sells of bad stocks. To Jones, more exposure was not necessary riskier, but rather could be more profitable. His own ‘net exposure’ was \$60,000, compared to \$80,000. Whatever the market situation was, this investment strategy allowed Jones to enjoy above-average gains. If the composite index goes up by 20% then the best stocks assumedly go up by 30%. Ordinary fund managers gain \$24,000 ($= 30\% \times \$80,000$). Managers who follow Jones’s strategy gain \$32,000 ($= 30\% \times \$130,000 - 10\% \times \$70,000$). The short sells made a loss of \$7,000 because the prices of the worst stocks go up just by 10% instead of 20%.

Jones’s hedge fund also involved looking out of his discipline or connecting dots in new ways. First, while Jones was not good at picking stocks, he was good at encouraging the best stock pickers to work for him. Jones invited brokers to run ‘paper portfolios’ by selecting their favourite shorts and longs then phone in changes. Although it was a fun game, Jones nevertheless compensated the players according to their performance earnings and used what he learned from as a source for stock-picking ideas. As a result,

brokers phoned Jones with hot ideas before passing them on to Jones's rivals. Today's online foreign exchange trading websites offer investors what Jones did six decades ago: simulative demo trading.

Jones was excellent at gathering critical information, which his competitor could not tap. And in the financial world, having information in advance of the others puts fund managers ahead of the markets. Not only did the 'paper portfolio' managers send hot tips to Jones, but his in-house staff members "scrambled for gossip and insights" [Mallaby, (2010), p.23]. One of them, Alan Drescher, went to the Securities Exchange Commission offices to read company filings as soon as they appeared while his Wall Street peers waited for the postal service to deliver those reports. The result: Jones had critical information sooner than peers.

Jones made profits from tax loopholes, too. Again, Jones was not an accountant but he was smart enough to find a good one. Richard Valentine, who was described 'cartoonishly absentminded' showed Jones that if managers took a share of a hedge fund's investment profits rather than a flat fee, they could be taxed at the capital-gains rate of 25% rather than 91% of personal income tax (this was in middle of the 20th century). When Jones duly charged his investors 20% of the upside, he termed it 'performance reallocation' to separate from "an ordinary bonus that would attract normal income tax".

He spotted many pivotal 'dots' for his industry, although simply spotting them did not make the leap he was known for. Jones needed to connect those separated dots into an efficient business model. Jones was neither good stock picker nor proficient tax-shield accountant nor a money-making portfolio manager. His major Aha! Moment (from connecting dots) came when he connected and integrated those talents into the hedged fund that accumulated a return of just under 5,000% in the 1949–1968 periods. Whether it was his intention or not, Jones absolutely had to follow a discipline of spotting the dots and trying many different ways to draw the most beautiful picture of those spotted dots.

Finally, Jones and his team had strong discipline and an approach to their work. To implement his investment strategy of selling short for hedging, Jones had to detect bad stocks (actually harder than finding good ones). Jones compared the volatility of all stocks, which he called 'velocity', with S&Ps 500 Index and in the process figured out the measurements for about two thousand firms' stocks at two-year intervals. This was done in the pre-personal computer era. Three years after the launch of Jones's fund, Markowitz (1952), published his paper called 'Portfolio Selection', in which he discussed how difficult it was to calculate correlations for just 25 stocks, because it demanded more computer memory than the Yale economics department could provide for him [Mallaby, (2010), p.21]. His ultimate success is rooted from tedious works on finding the most insightful information about different expertise and never-ending efforts to make the best use of these insights together.

When studying the case of Alfred Winslow Jones, it is noted individual innovations – many are resulted from out-of-box discipline – are prevailing and intuitively. The other two disciplines of connecting the dots, and consistently and patiently employing methods of creativity are behind the scene. However, the inter-correlation of the three creative disciplines are obvious because any innovative outcome/performance, whether an intermediary or ultimatum, is resulted from collaboration of the three.

5.3 *Serendipity is... not serendipitous*

Once inputs arrive, the importance of out-of-the-box discipline comes into play. People who are able to look at information from different viewpoints may be able likely to spot an opportunity for a creative outcome which is

- 1 out of the ordinary
- 2 unintentional
- 3 something others have not noticed.

Next, those from different disciplines may have the ability to connect previously discrete pieces of information to solve a problem or to uncover an opportunity. Napier and Vuong (2013) suggest that organisations and individuals who tap serendipity, which is ability to notice, evaluate, and take advantage of unexpected information better or faster than competitors, may build or develop this as an advantage.

But, despite its benefits, serendipity is not serendipitous. The former is a method of making creativity. The latter describes unexpected exploration of an opportunity which seemingly appears out of the blue. For instance, when the exhausted Cannon engineering team, who had been stuck on making easy-and-cheap, disposable copier drums, went out for some beer, a beer can led Canon to the development of aluminium copier drums by analogy [Nonaka, (1991), p.101]. Serendipity – as a method – offers innovation capacity improvement by increasing awareness of the existence of unlooked-for but valuable possibilities (Napier and Vuong, 2013). Therefore, there cannot be such a serendipity-based approach of making creativity that is serendipitous. In reality, although hard to plan, but much of the serendipity-based approach's outcome is expected, accepting the varying forms and specifics of the emergent outcome.

While it seems that successes of creative performance are most often reported and praised, numerous mistakes and missed opportunities, which may be ignored, are critical for ultimate success. A person able to spot opportunities needs practice in the process and admits how tedious the innovation process may be. Such stories can be learned from champion entrepreneurs in Vietnam who joined a well-known inclusive innovation capacity survey commencing in early 2014 (the i2Metrix, in short) (Vuong et al., 2014b).

Minh Long I is now famous for capacity to bake ceramic and porcelain products at temperature as high as 1,380°C while the best producers in France and Japan can only meet 1,360°C and 1,320°C. Ly Ngoc Minh – founder of Minh Long I – unveils that the success was rooted in an unexpected chance to visit the factory of German kiln manufacturer Reidhammer in 1996. Minh participated the most expensive Abiente Frankfurt Fair, not for selling his products but investigating how world-class ceramic and porcelain were made. He tried to visit Reidhammer but was not allowed to get inside the factory. On the way back to hotel, Minh met a German friend who convinced him to return. After driving hundred miles again, his friend helped Minh eye-witness entire manufacturing process as well as take photos as much as he can. Few years later, Reidhammer installed the hottest kiln in the world in Minh Long I Factory in Binh Duong, Vietnam.

At Vinamit, Nguyen Lam Vien – the inventor of dried jackfruits – learned that frozen jackfruits can produce better fried products by accident. “When the business grew up we had to purchase more fresh jackfruits. To keep the fruits fresh longer we put them in freezer storage. Then we realised that fried jackfruits made from frozen jackfruits tasted

much better”, Vien told the i2Metrix researchers. But it was not that easy. Vien and his team had to enter a trial-and-error process in months before knowing how long should the fresh jackfruits be kept in freezer and which level of temperature is the most appropriate.

In addition, Brown (2014) is impressed by the serendipity-based success of Kao Sieu Luc – founder of Vietnamese ABC Bakery – who is making burger buns for all major fast food chains in Vietnam including Starbucks, Burger King, and McDonald. The Chinese-origin Luc was among thousands of Cambodian refugees fleeing to Vietnam to escape the bloody Khmer Rouge in 1979. He knew no Vietnamese word nor how to make bread. Luc started as a flour delivery boy to bakeries and 30 years later people call him the ‘Bread Great Master’. One reason for the title is Luc’s invention of ‘*instant*’ bread. Despite not drinking alcohol, Luc imitated fermentation of winemaking in flour-preparation for making bread. Then his fermented flour can be kept in 24 to 36 hours. “Then you bake the flour when you need bread. Its smell and taste are even more delicious”, Luc ensures.

Rare, lucky and probably unrealistic, is the ‘only-one-time serendipitous person’. Also, to be so fortunate on a first try may in fact dampen resilience to try again after such a windfall. Focusing on spotting opportunity to escape from the other creative disciplines, perhaps, results in a popular mistake in relationship-based and rent-seeking economies, such as Vietnam. That is, increasing the chance of meeting serendipity by trying to enrich information inputs and quickly make decision on any spotted point. That results in a contingent strategy. Even when there are many insightful points, the process that transforms insights and creative ideas into new product, service, and solution still needs a logical connection and a disciplined process of employing methods of creativity. Here, there is a dilemma. People try to collect information as much as possible in order to make well-informed decisions. Meanwhile, if they are lack of methods to digest the information then the more they get the more confused they are. In light of this, the bunch of valuable information is worthless.

There are also serendipitous outcomes but without creativity. For instance, a veteran accountant finds a way to cheat tax collectors and in the process make a lot of money. Although his solution is novel and creates pecuniary value, it is not appropriate. One of the two pivotal characteristics of creativity is not satisfied.

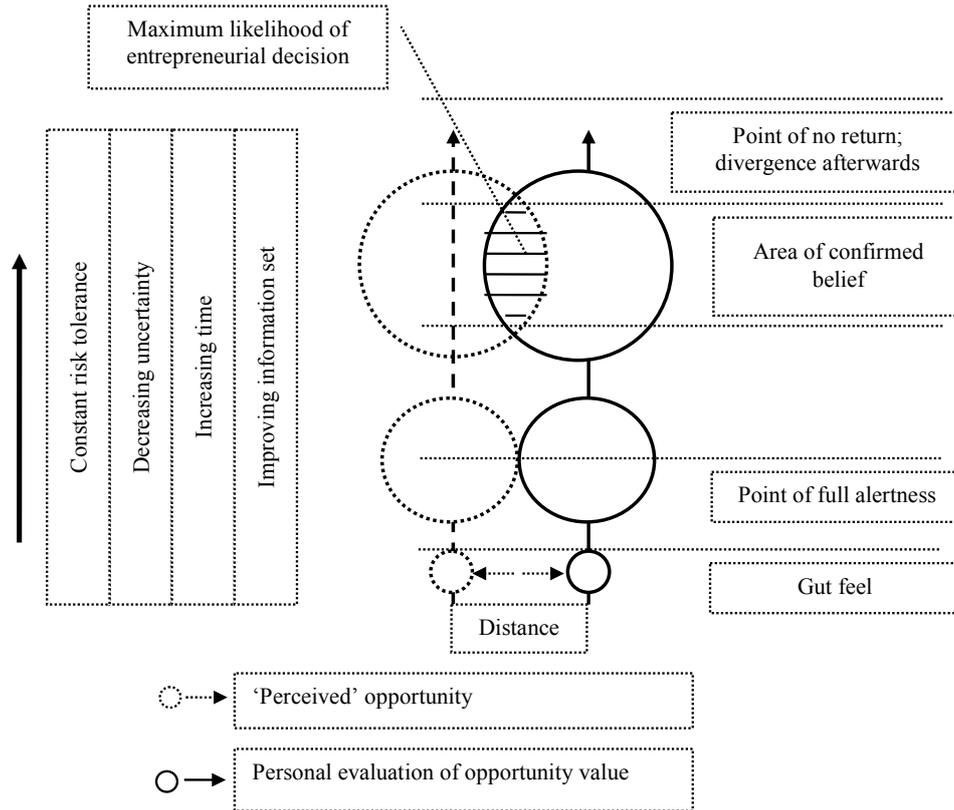
5.3.1 Critical elements to make serendipity valuable

Taking advantage of unsought/unexpected inputs (i.e., serendipity) works under certain conditions. First, the user needs to have a desire to make a difference. The ‘owner’ of serendipity typically has a decision or problem that is festering and, when the unexpected information arises, is able to see its value and use it to make a positive difference for an organisation, such as finding new business opportunities. Then, evaluation is similar to the filtration approach described above. The ‘permanent bank’ of experience and understanding of a market situation and management theories, in conjunction with entrepreneurial alertness and risk tolerance, helps entrepreneurs evaluate how their readiness to move from the ‘observed’ insights to a valuable innovation in the marketplace, or in our view the distance from his personal evaluation and the ‘perceived’ opportunity.

Second, a manager who wishes to tap serendipity needs to be willing and able to reach out of own discipline. For many people, if the ‘distance’ between disciplines is large, then the manager may forget (or not understand) the information. The

serendipity-based innovator, instead, sees value in the information and a potential opportunity; then may gather additional helpful inputs through discussions with friends or experts, or simply by surfing the internet on something else, always storing unexpected initial information somewhere in mind.

Figure 5 Information process of serendipity



Third, the person attuned to serendipity is able to connect (odd) dots. Systematic collection of external information provides the serendipity maker with a number of separate dots of inputs and information, which, if connected could become a solution or new level of understanding. Then the left dashed circle (Figure 5) becomes larger and larger. In parallel, the 'internal' information, in the right hand circle, consists of knowledge, capital, business relations, production capacity, and even willingness and imagination is improved as results of education and learning by doing. The two sets of information (external and internal) are correlated. The more external dots the serendipity maker spots, the better he could become at evaluating opportunity. The more efficiently he connects the dots, the better he is at detecting missing points. For example, when public media reports an increasing number of securities-investment success stories, business people start paying more attention to securities market, enriching their set of internal information by reading news, watching market movements, or enrolling evening classes on securities businesses.

Last is the routine or discipline a person needs to employ methods of boosting creativity. The disciplined process of spotting and connecting the dots creates the shaded area where two sets of information intersect. This is when the serendipity maker can use the insights to make decisions. Even so, the two sets must not always overlap for a decision to emerge. This is where the role of entrepreneurial spirit helps decide to move or not.

5.4 *Some related empirical evidence*

The entrepreneurial information process of creativity which is conceptualised and virtualised in previous section suggests possibility of designing empirical exploration of creativity making process. Although it is hard to quantify intangible concepts of creativity and innovation, success and failure, risk appetite, and quality level of information, the methodology of categorical data analysis is of help. There are attempts to statistically examine creativity's relation to culture and business development stage (Vuong et al., 2013a) as well as causality between creativity, capability of making creativity/innovation and reliance on physical resources (Vuong and Napier, 2014), corporate performance after M&A transaction (Vuong et al., 2014a), financial failures of collapse and fraud (Vuong, et al., 2013b).

Viewing creativity/innovations as methodological process, Vuong et al. (2013a) suggest that there is a relationship between creativity, culture and business development stage. An investigation of 115 individual respondents into their business successes is designed to examine relationships between three methods of creativity (i.e., 3D process, Aha! Moment, and serendipity), cultural aspects (i.e., reliance on personal relations, level of risk tolerance, and ability to tap available resources), and stage of business development (i.e., start-up, and well established operation or widely recognised brand). Empirical evidence supports the idea that creativity plays a critical role in the 'entrepreneurial stage' of a business lifecycle, when cultural values and entrepreneurship pursuit in specific contexts help determine goals, plans and methods to implement. To a certain extent, this complements well to Vuong et al. (2011), which develops a framework considering political decisions of major changes as an 'entrepreneurial process' that adopts useful new ideas of economic management, builds foundations and lines up for political supports. The investigation also unveils that among the three methods of creativity, 3D process plays the most significant role in the entrepreneurial stage.

Vuong and Napier (2013) provide a counter-example of creative performance as empirical evidence suggests that Vietnamese corporate sector is addicted to capital and physical asset endowments while downplaying down the capability of making creativity and innovation. The addiction is named 'resource curse' that "becomes identical to 'destructive creation' implemented by *ex ante* resource-rich firm and worsens the problem of resource misallocation in transition turmoil." Statistical examination of 154 firms – of which, 150 are randomly selected from approximately 700 listed firms on Vietnamese stock exchanges – finds with the absence of creative discipline, a successful Vietnamese firms typically relies on "either abundant capital resources or favourable conditions tapping physical asset endowments". In addition, reliance on resources and adoption of creativity are likely mutually exclusive.

Moreover, when examining 256 cases of financial collapse in 2007–2013 period, Vuong et al. (2013b) suggest that the association between business approach (i.e., rent-seeking vs. creativity making) and corporate orientation (i.e., tapping out resources or seeking prospective markets) is the best-fit predictor. Financial failure and fraud, which become rampant when Vietnam enters an economic turbulence, are eroding trust in the economy. The work also points out that the cause of financial collapse is not asymmetric information (Pressman, 1998) but “the lack of cost-benefit consideration and multi-layer filtered information”, or lack of a functioning appropriate 3D process in both pre- and post-M&A phases.

Employing a categorical data sample of 212 M&A cases conducted from 2005 to 2012, Vuong et al. (2014a) investigate the relationship between determination of controlling an acquired firm’s capital, assets, and brand versus its capability of innovation and *ex post* performance. Empirical evidence suggests negative performance of post M&A operations is likely rooted in an overwhelming ‘resource acquiring’ strategy and negligence on innovation factor – for instance, a human resource, especially corporate leaders, willing and able to make creativity. Indeed, many sellers consider M&A an exit or even an end of their entrepreneurial endeavours (Vuong et al., 2010). In a post M&A period, some enjoy comfortable lives of wealthy retired businesspeople while others start new venture of being capitalist.

6 Concluding remarks

This paper seeks to build on previous work relating to creative disciplines by adding the idea of information processing as a critical component and input. As a form of ‘dot connecting’, it seeks to synthesise entrepreneurship and creativity as well. Examples from business and other disciplines – for instance, physics and history – was used to illustrate in the exploratory framework.

The filtration mechanism is also an information process of creativity. Permanent bank needs to be enriched continuously. Richer knowledge and experience brings more opportunities for the soft skills to evaluate information and efficiently connect the insights. This implies that there is a discipline of teaching creativity.

The conceptual paper offers an applicable and practicable, framework of information process of creativity with intuitive illustrations. It also provides opportunity to design empirical investigation into creativity’s relations and causality.

So what can business leaders and academics take away from the discussion?

Firstly, from a production point of view, innovative production systems may be seen as ones that employ conventional production inputs, namely labour (L), capital (K), to produce desired outputs. To stress the importance of innovation, in replacement of the ‘technology factor’, information should be a production input of significant importance, which is denoted as Ω . Meanwhile, a set of creativity methods following the principle of ‘disciplines’ is denoted as 3D.

Naturally, human wants a transformation that brings innovation into the value of output (V), which is measured and justified by both the market pricing, sales information, and valuation of the innovativeness, and with the 3D being parameters/benchmarks for measurement. Thus, one can symbolically write that process in the following expression:

$$f(K, L, \Omega; 3D) \rightarrow V(\Omega_{\text{Innovations}}; 3D)$$

This ‘nominal’ representation can be modelled in some ways for economic insights, such as the modelling attempt in Vuong and Napier (2013).

Secondly, there are likely more important implications for HRM and change management practices if a team or an organisation aims to improve its creative performance. The most direct implication is about facilitating access to sources of expert information (including market insights), writing clear rules about limits of risk tolerance for personnel, installing “disciplined process for productive performance”, and diagnosing ability to learn and make creativity, especially that of key managers and corporate leaders.

Last, recent empirical studies (e.g., Napier et al., 2012; Vuong et al., 2013a, 2014a) report that creativity methods, particularly 3D method, lend themselves well to the entrepreneurial stage of a business operation. Indeed, multi-filtering information process is employed as one of the ten dimensions that help measure corporate innovation capacity successfully in the i2Metrix Program (Vuong et al., 2014b). These results together with relevant discussions about conditions and the limit of impact also suggest the existence of a creativity enabling setting we define as ‘entrepreneurial space’ in which individuals and teams know how to increase the flows of useful information for decision of making innovations and are able to do that when they have motivation. They can do that only with an appropriate organisational structure, cultural values and with clear orientation to and determination of pursuing creative performance as a strategic goal.

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References

- Ahuja, G. and Lampert, C.M. (2001) ‘Entrepreneurship in the large corporation: a longitudinal study of how established firms create breakthrough inventions’, *Strategic Management Journal*, Vol. 22, Nos. 6/7, pp.521–543.
- Akgün, A.E., Lynn, G.S. and Byrne, J.C. (2003) ‘Organizational learning: a socio-cognitive framework’, *Human Relations*, Vol. 56, No. 7, pp.839–868.
- Allen, T.J. (1971) ‘Communication networks in R&D labs’, *R&D Management*, Vol. 1, No. 1, pp.14–21.
- Amabile, T. (1996) ‘Creativity and innovation in organizations’, *Harvard Business School Lecture*, Note 9, pp.396–239.
- Amabile, T. and Conti, R. (1999) ‘Changes in the work environment for creativity during downsizing’, *The Academy of Management Journal*, Vol. 42, No. 6, pp.630–640.
- Amabile, T., Barsade, S., Mueller, J. and Staw, B. (2005) ‘Affect and creativity at work’, *Administrative Science Quarterly*, Vol. 50, No. 3, pp.367–403.
- Ancona, D.G. and Caldwell, D.F. (1992) ‘Bridging the boundary: external activity and performance in organizational teams’, *Administrative Science Quarterly*, Vol. 37, No. 4, pp.634–665.
- Ariely, D. (2000) ‘Controlling the information flow: effects on decision making and consumer preferences’, *Journal of Consumer Research*, Vol. 27, No. 2, pp.233–248.

- Axelrod, A. (2008) *Edison on Innovation: 102 Lessons in Creativity for Business and Beyond*, Jossey-Bass, San Francisco, CA.
- Barczak, G., Lassk, F. and Mulki, J. (2010) 'Antecedents of team creativity: an examination of team emotional intelligence, team trust and collaborative culture', *Creativity and Innovation Management*, Vol. 19, No. 4, pp.332–345.
- Barron, F. (1963) 'Needs for order and disorder', in Taylor, C.W. and Barron, F. (Eds.): *Scientific Creativity: Its Recognition and Development*, John Wiley & Sons, New York.
- Batallas, D.A. and Yassine, A.A. (2006) 'Information leaders in product development organizational networks: social network analysis of the design structure matrix', *IEEE Transactions on Engineering Management*, Vol. 53, No. 4, pp.570–582.
- Berkun, S. (2007) *The Myths of Innovation*, O'Reilly, Sebastopol, CA.
- Birzer, B. (1999) 'Expanding creative destruction: entrepreneurship in the American West's', *The Western Historical Quarterly*, Vol. 30, No. 1, pp.45–63.
- Bissola, R. and Imperatori, B. (2011) 'Organizing individual and collective creativity: flying in the face of creativity clichés', *Creativity and Innovation Management*, Vol. 20, No. 2, pp.77–89.
- Bohm, D. (1968) 'On creativity', *Leonardo*, Vol. 1, No. 2, pp.137–149.
- Brown, M. (2014) 'Ho Chi Minh City bakery figures out the ABC of burger bun success', *The Guardian*, 12 April [online] <http://www.theguardian.com/world/2014/apr/12/ho-chi-minh-city-vietnam-bakery-abc-burger-bun> (accessed 15 August 2014).
- Brown, T.E., Davidsson, P. and Wiklund, J. (2001) 'An operationalization of Stevenson's conceptualization of entrepreneurship as opportunity-based firm behavior', *Strategic Management Journal*, Vol. 22, No. 10, pp.953–968.
- Chapman, R.L., Soosay, C. and Kandampully, J. (2003) 'Innovation in logistic services and the new business model: a conceptual framework', *International Journal of Physical Distribution & Logistics Management*, Vol. 33, No. 7, pp.630–650.
- Chiu, C. and Kwan, L. (2010) 'Culture and creativity: a process model', *Management and Organization Review*, Vol. 6, No. 3, pp.447–461.
- Choo, C.W. (1996) 'The knowing organization: how organizations use information to construct meaning, create knowledge and make decisions', *International Journal of Information Management*, Vol. 16, No. 5, pp.329–340.
- Cohen, W.M. and Levinthal, D.A. (1990) 'Absorptive capacity: a new perspective on learning and innovation', *Administrative Science Quarterly*, September, Vol. 35, No. 1, pp.128–152.
- Courant, R., Robbins, H. and Stewart, I. (1996) *What is Mathematics? An Elementary Approach to Ideas and Methods*, Oxford University Press, New York, NY.
- Day, G.S. (1994) 'The capabilities of market-driven organizations', *Journal of Marketing*, Vol. 58, No. 4, pp.37–52.
- Day, R.H. (1995) 'Rationality, entrepreneurship and institutional evolution', *Revue économique*, Vol. 46, No. 6, pp.1473–1485.
- De Dreu, C.K. (2007) 'Cooperative outcome interdependence, task reflexivity, and team effectiveness: a motivated information processing perspective', *Journal of Applied Psychology*, Vol. 92, No. 3, p.628.
- De Dreu, C.K. (2010) 'Human creativity: reflections on the role of culture', *Management and Organization Review*, Vol. 6, No. 3, pp.437–446.
- Degraff, J. and Lawrence, K.A. (2002) *Creativity at Work*, Wiley & Son, New York, NY.
- Egan, T. (2005) 'Factors influencing individual creativity in the workplace: an examination of quantitative empirical research', *Advances in Developing Human Resources*, Vol. 7, No. 2, pp.160–181.
- Erez, M. and Nouri, R. (2010) 'Creativity: the influence of cultural, social, and work contexts', *Management and Organization Review*, Vol. 6, No. 3, pp.351–370.
- Florida, R. (2002) *The Rise of the Creative Class. And How It's Transforming Work, Leisure and Everyday Life*, Basic Books, New York, NY.

- Florida, R. (2005) *Cities and the Creative Class*, Routledge, New York, NY.
- Gilson, L.L. and Shalley, C.E. (2004) 'A little creativity goes a long way: an examination of teams' engagement in creative processes', *Journal of Management*, Vol. 30, No. 4, pp.453–470.
- Glaveanu, V.P. (2010) 'Creativity as cultural participation', *Journal for the Theory of Social Behaviour*, Vol. 44, No. 1, pp.48–67.
- Gloet, M. and Terziovski, M. (2004) 'Exploring the relationship between knowledge management practices and innovation performance', *Journal of Manufacturing Technology Management*, Vol. 15, No. 5, pp.402–409.
- Greenfield, S.M. and Strickon, A. (1981) 'A new paradigm for the study of entrepreneurship and social change', *Economic Development and Cultural Change*, Vol. 29, No. 3, pp.467–499.
- Guilmette, L. (2012) *The History of Maxwell's Equations*, WAC Prize Winners, paper 3.
- Hedberg, B. (1981) 'How organizations learn and unlearn', in Starbuck, W.H. and Nystrom, P.C. (Eds.): *Handbook of Organizational Design*, pp.3–27, Oxford University Press, London.
- Henard, D.H. and Szymanski, D.M. (2001) 'Why some new products are more successful than others', *Journal of Marketing Research*, Vol. 38, No. 3, pp.362–375.
- Huber, G.P. (1991) 'Organizational learning: the contributing processes and the literatures', *Organizational Science*, Vol. 2, No. 1, pp.88–115.
- Inkpen, A.C. and Dinur, A. (1998) 'Knowledge management processes and international joint ventures', *Organization Science*, Vol. 9, No. 4, pp.454–468.
- Isaksen, S.G. and Ekvall, G. (2010) 'Managing for innovation: the two faces of tension in creative climates', *Creativity and Innovation Management*, Vol. 19, No. 2, pp.73–88.
- John-Steiner, V. (1997) *Notebooks of the Mind: Explorations of Thinking*, Oxford University Press, Cambridge, MA.
- Joseph, R. (2011) *Neuroscience: Neuropsychology, Neuropsychiatry, Brain & Mind*, University Press/Amazon Digital Services, digital/internet.
- Kandampully, J. (2002) 'Innovation as the core competency of a service organisation: the role of technology, knowledge and networks', *European Journal of Innovation Management*, Vol. 5, No. 1, pp.18–26.
- Kao, J. (2007) *Innovation Nation: How America Is Losing Its Innovation Edge, Why It Matters, and What We Can Do to Get It Back*, Free Press, New York, NY.
- Kaufmann, G. (2004) 'Two kinds of creativity – but which ones?', *Creativity and Innovation Management*, Vol. 13, No. 3, pp.154–165.
- Kirzner, I.M. (1973) *Competition and Entrepreneurship*, University of Chicago Press, Chicago, IL.
- Klein, R.D. (1982) 'An inquiry into the factors related to creativity', *The Elementary School Journal*, Vol. 82, No. 3, pp.256–265.
- Kronfeldner, E.M. (2009) 'Creativity naturalized', *The Philosophical Quarterly*, Vol. 59, No. 237, pp.577–592.
- Kyriakopoulos, K. and De Ruyter, K. (2004) 'Knowledge stocks and information flows in new product development', *Journal of Management Studies*, Vol. 41, No. 8, pp.1469–1498.
- Lumpkin, G.T. and Dess, G.G. (1996) 'Clarifying the entrepreneurial orientation construct and linking it to performance', *The Academy of Management Review*, Vol. 21, No. 1, pp.135–172.
- Mallaby, S. (2010) *More Money Than God: Hedge Funds and the Making of New Elite*, The Penguin Press, New York, NY.
- March, J.G. (1991) 'Exploration and exploitation in organizational learning', *Organizational Science*, Vol. 2, No. 1, pp.71–87.
- Markowitz, H. (1952) 'Portfolio selection', *Journal of Finance*, Vol. 7, No. 1, pp.77–91.
- McAdam, R. and Keogh, W. (2004) 'Transitioning towards creativity and innovation measurement in SMEs', *Creativity and Innovation Management*, Vol. 13, No. 2, pp.126–139.
- McDougall, P.P. and Oviatt, B.M. (2000) 'International entrepreneurship: the intersection of two research paths', *The Academy of Management Journal*, Vol. 43, No. 5, pp.902–906.

- McMillan, J. and Woodruff, C. (2002) 'The central role of entrepreneurs in transition economies', *Journal of Economic Perspectives*, Vol. 16, No. 3, pp.153–170.
- Miron E., Erez, M. and Naveh, E. (2004) 'Do personal characteristics and cultural values that promote innovation, quality, and efficiency compete or complement each other?', *Journal of Organizational Behavior*, Vol. 25, No. 2, pp.175–199.
- Moorman, C. (1995) 'Organizational market information processes: cultural antecedents and new product outcomes', *Journal of Marketing Research*, Vol. 32, No. 3, pp.318–335.
- Moorman, C. and Miner, A.S. (1997) 'The impact of organizational memory on new product performance and creativity', *Journal of Marketing Research*, Vol. 34, No. 1, pp.91–106.
- Murphy, P. (2005) 'Knowledge capitalism', *Thesis Eleven*, Serial No. 81, pp.36–62.
- Napier, N.K. (2010) *Insight: Encouraging Aha! Moments for Organizational Success*, Praeger, Westport, CT.
- Napier, N.K. and Nilsson, M. (2008) *The Creative Discipline: Mastering the Art and Science of Innovation*, Praeger, Westport, CT.
- Napier, N.K. and Vuong, Q.H. (2013) 'Serendipity as a strategic advantage', in Wilkinson, T. (Ed.): *Strategic Management in the 21st Century*, Vol. 1, pp.175–199, Praeger, Westport, CT.
- Napier, N.K., Bahnson, P.R., Glen, R., Maille, C.J., Smith, K. and White, H. (2009) 'When 'aha moments' make all the difference', *Journal of Management Inquiry*, Vol. 18, No. 1, pp.64–76.
- Napier, N.K., Dang, L.N.V. and Vuong, Q.H. (2012) 'It takes two to tango: entrepreneurship and creativity in troubled times – Vietnam 2012', *Sociology Study*, Vol. 2, No. 9, pp.662–674.
- Napier, N.K., Leonard, N.H. and Sendler, Z. (2006) 'Facilitating management and marketing creativity in global markets', *Organizational Dynamics*, Vol. 35, No. 3, pp.220–236.
- Nonaka, I. (1991) 'The knowledge-creating company', *Harvard Business Review*, Vol. 69, No. 6, pp.96–104.
- Paulus, P.B. and Nijstad, B.A. (2003) *Group Creativity: Innovation Through Collaboration*, Oxford University Press, Cambridge, MA.
- Peters, M.A. (2009) 'Education, creativity and the economy of passions: new forms of educational capitalism', *Thesis Eleven*, Serial No. 96, pp.40–63.
- Pressman, S. (1998) 'On financial frauds and their cause', *American Journal of Economics and Sociology*, Vol. 57, No. 4, pp.405–421.
- Probst, T., Stewart, S., Gruys, M. and Tierney, B. (2007) 'Productivity, counter productivity and creativity: the ups and downs of job insecurity', *Journal of Occupational and Organizational Psychology*, Vol. 80, No. 3, pp.479–497.
- Purves, D. (2010) *Brains: How They Seem to Work*, Person Education, Inc., Upper Saddle River, NJ.
- Rogers, E. (1983) *Diffusion of Innovations*, Free Press, New York.
- Runco, M.A. (2004) 'Creativity', *Annual Review of Psychology*, Vol. 55, No. 3, pp.657–687.
- Runco, M.A. and Jaeger, G.J. (2012) 'The standard definition of creativity', *Creativity Research Journal*, Vol. 24, No. 1, pp.92–96.
- Runco, M.A. and Richards, R. (1997) *Eminent Creativity, Everyday Creativity, and Health*, Praeger, Greenwich, CT.
- Schumpeter, J.A. (1942[1994]) *Capitalism, Socialism and Democracy*, Psychology Press, NY.
- Shneiderman, B. (2000) 'Creating creativity: user interfaces for supporting innovation', *ACM Transactions on Computer-Human Interaction (TOCHI)*, Vol. 7, No. 1, pp.114–138.
- Sosa, M.E. (2000) *Analyzing the Effects of Product Architecture on Technical Communication in Product Development Organizations*, Unpub. PhD dissertation at M.I.T.
- Starbuck, W.H. (1992) 'Learning by knowledge-intensive firms', *Journal of Management Studies*, Vol. 29, No. 6, pp.713–740.
- Sternberg, R.J. (1999) 'The theory of successful intelligence', *Review of General Psychology*, Vol. 3, No. 4, pp.292–316.

- Stevenson, H.H. and Jarillo, J.C. (1990) 'A paradigm of entrepreneurship: entrepreneurial management', *Strategic Management Journal*, Vol. 11, No. 1, pp.17–27.
- Tarafdar, M. and Gordon, R.S. (2007) 'Understanding the influence of information systems competencies on process innovation: a resource-based view', *Journal of Strategic Information System*, Vol. 16, No. 4, pp.353–392.
- Taylor, D.W. (1960) 'Thinking and creativity', *Annals of the New York Academy of Sciences*, Vol. 91, No. 1, pp.108–127.
- Teece, D.J. (1996) 'Firm organization, industrial structure, and technological innovation', *Journal of Economic Behavior & Organization*, Vol. 31, No. 2, pp.193–224.
- Teigland, R. and Wasko, M. (2003) 'Integrating knowledge through information trading: examining the relationship between boundary spanning communication and individual performance', *Decision Sciences*, Vol. 34, No. 2, pp.261–286.
- Udwadia, F.E. (1990) 'Creativity and innovation in organizations: two models and managerial implications', *Technological Forecasting and Social Change*, Vol. 38, No. 1, pp.65–80.
- Unsworth, K. (2001) 'Unpacking creativity', *Academy of Management Review*, Vol. 26, No. 2, pp.289–297.
- Unsworth, K. and Clegg, C. (2010) 'Why do employees undertake creative actions?', *Journal of Occupational and Organizational Psychology*, Vol. 83, No. 1, pp.77–99.
- Vander Hook, S. (2009) *Johannes Gutenberg: Printing Press Innovator*, Abdo Publishing Co., Edina, MN.
- Von Hippel, E. (1988) *The Sources of Innovation*, Oxford University Press, New York.
- Vuong, Q.H. and Napier, N.K. (2013) 'Anatomy of the 3D innovation production with the Cobb-Douglas specification', *Sociology Study*, Vol. 3, No. 1, pp.69–78.
- Vuong, Q.H. and Napier, N.K. (2014) 'Resource curse or destructive creation in transition: evidence from Vietnam's corporate sector', *Management Research Review*, Vol. 37, No. 7, pp.642–657.
- Vuong, Q.H., Dam, V.N., Van Houtte, D. and Tran, T.D. (2011) 'The entrepreneurial facets as precursor to Vietnam's economic renovation in 1986', *The IUP Journal of Entrepreneurship Development*, Vol. 8, No. 4, pp.6–47.
- Vuong, Q.H., Napier, N.K. and Tran, T.D. (2013a) 'A categorical data analysis on relationships between culture, creativity and business stage: the case of Vietnam', *International Journal of Transitions and Innovation Systems*, Vol. 3, No. 1, pp.4–24.
- Vuong, Q.H., Napier, N.K., Tran, T.D. and Nguyen, H.K.T. (2013b) 'A categorical data analysis on financial failures in Vietnam, 2007–2013', *International Journal of Business and Management*, Vol. 8, No. 18, pp.87–94.
- Vuong, Q.H., Napier, N.K. and Samson, D.E. (2014a) 'Relationship between innovations, capital expenditures and post-M&A performance: evidence from Vietnam, 2005-2012', *IUP Journal of Business Strategy*, Vol. 11, No. 1, pp.34–41.
- Vuong, Q.H., Napier, N.K., Vu, K.H., Nguyen, M.C. and Tran, T.D. (2014b) 'Measuring corporate innovation capacity: experience and implications from i2Metrix implementation in Vietnam', *ASEAN Journal of Management and Innovation*, Vol. 1, No. 1, pp.1–17.
- Vuong, Q.H., Tran, T.D. and Nguyen, T.C.H. (2010) 'Mergers and acquisitions market in Vietnam's transition economy', *Journal of Economic Policy and Research*, Vol. 5, No. 1, pp.1–54.
- Wallas, G. (1926) *The Art of Thought*, Harcourt, Brace & Co., New York, NY.
- Walsh, J.P. and Ungson, G.R. (1991) 'Organizational memory', *Academy of Management Review*, Vol. 16, No. 1, pp.57–91.
- West, M.A. (2002) 'Sparkling fountains or stagnant ponds: an integrative model of creativity and innovation implementation in work groups', *Applied Psychology: An International Review*, Vol. 51, No. 3, pp.355–424.

Wilson, S. (2002) *Information Arts: Intersections of Art, Science, and Technology*, The MIT Press, Boston, MA.

Worris, M. and Leung, K. (2010) 'Creativity East and West: perspectives and parallels', *Management and Organization Review*, Vol. 6, No. 3, pp.313–327.

Notes

1 <http://library.thinkquest.org/3487/qp.html>.