



# Culture and Empathy

International Journal of  
Sociology, Psychology, and Cultural Studies



ISSN: 2635-6619 (Online) Journal homepage: <https://culturenempathy.org/>

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To cite this article: Charles Hampden-Turner, Raymond Ferris Abelin. 2020. “How Might Culture Hinder or Help Innovation? The Culture Clash between the Formality and the Informality Needed to Innovate.” *Culture and Empathy* 3(1-2): 3-22, DOI: 10.32860/26356619/2020/3.12.0002.

To link to this article: <https://doi.org/10.32860/26356619/2020/3.12.0002>



Published online: 30 Jun 2020.



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## How Might Culture Hinder or Help Innovation?

### The Culture Clash between the Formality and the Informality Needed to Innovate

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#### Abstract

The informal operates outside of established formal and more organized methods of innovation. The dynamics between the informal and formal is particularly challenging to Western cultures due to increased competition outside of the well-defined rules, regulations, and guidelines intended to sustain organizational development. Innovation is a key driver of the informal economy, but we contend that, since formal economies have become heavily reliant on technological innovation, the resulting rapid, sometimes radical, systemic changes are the result of informal economic forces. We provide 20 illustrative examples and different approaches to the clash of formality and informality to analyze how the latter comes to the rescue of the former within the context of culture and innovation.

#### ARTICLE HISTORY

Received May 12, 2020

Revised June 4, 2020

Accepted June 8, 2020

#### KEYWORDS

Culture, Economy,  
Formality, Informality,  
Innovation

#### Introduction

The origins of all human culture are informal. Behavior, whether human or organizational, becomes codified and formalized over time. As a consequence of successful practice, it is repeated and after repetition it also becomes habitual and formalized. Anything new, creative, innovative, or experimental is informal by definition in these earliest stages. To the extent that formal systems are experienced as unsatisfactory, informal activities will qualify them and render these more palatable. Some formalities become obsolete and informalities may cut them back. Formalities tend to be overruled by the exercise of commonsense and personal judgement and if reimposed, reduce output.

We examine several different approaches to this clash of formality with informality to analyze how the latter comes to the rescue of the former within the context of culture and innovation. When the formal and informal converge, as they do in many of our illustrations and

examples, they can become cultural and social change agents. With a focus on innovation, we address the role of informal processes in establishing effective formal procedures. These are seen as the informal preludes to more systematic conduct. We will trace some major conflicts between informality and formality in the field of management studies, cite some relevant theories, and discuss the work needed to help address the research gap.

Our research question is broad: What is the role and importance of informal social processes in innovation? There is mounting pressure on developed economies to innovate. Innovation has very informal, difficult to verify, origins. There is a research gap as many researchers prefer phenomena that stand still and have clear definitions, while informal processes are dynamic and blur at the edges. The closer we come to the innovative fountainhead, the harder it becomes to grasp what is occurring. Csikszentmihalyi's (1990) work on flow states is the exception. This shows that when the *challenges* faced by a group almost exactly match its *skills*, then these competing processes suddenly join in a rush of excitement and high performance as they synergize. Hampden-Turner (2009) and Trompenaars and Hampden-Turner (2009) show that laws and exceptions typically "annoy" each other and conflict, but there comes a moment of mutual engagement wherein the exception (im)proves the rule and the rule is successfully revised.

### **Culture and Innovation**

Culture has been seen in a variety of ways (see Hofstede, 1980; Redding, 1990; House et al., 2002). For example, six of the seven culture value dimensions articulated by Trompenaars and Hampden-Turner (1997) can lead to *both* adversarial debate and conflict *and* to reconciled integrity. Deming (1982), for example, showed that errors and corrections led to continuous improvement, with each error corrected in turn and the whole organization learning. Yet how often is error abused by those eager to correct? Hudson (1966) detailed the endless rivalry between the two cultures of the liberal arts and the sciences and pointed out that in an innovative breakthrough, science joins with art in a single thrust. Kohlberg (1981) showed that confronting a moral dilemma stimulated higher stages of moral development, and he posed several dilemmas to those he was researching. Innovation, integrity, and development occur when values suddenly fuse and integrate, but there remains the danger that they will come apart.

### **The Origins of Informality: 20 Illustrations**

The informal economy is both a prelude to and a corrective impulse to the formal economy. It asks whether existing procedures are fit for human beings and contribute to their happiness and development as people. When people engage in informal activities, this is done to restore conviviality and creativity, which may otherwise be missing. Activities found to be valuable will be formalized over time but will lose their spontaneity.

We now list, with short descriptions, our 20 illustrations, examples of how informality originates, criticizes, and modifies new formal systems so as to renew these and render them more effective. Following this, we detail each of them. The rest of our paper will probe more deeply into the claims made above and will cite research that supports this.

*Informal System as a Critique of the Formal System in the Factory*

As early as the 1930s, Mayo and his colleagues drew attention to the clash of the formal with the informal system within the factory (Roethlisberger, Dickson, and Western electric company, 1934). While the formal system individualized each employee, offering them piecework incentives for meeting and exceeding standards, workers devised an informal system whose function was to subvert these aims and substitute preferred norms. This took the form of work restriction norms aimed at “rate-busters,” those who exceeded standards and might lead these to be raised in future. They came under informal pressure to slow down and protect the jobs and comfort of fellow workers.

The researchers regarded this informal system as a *critique* of the formal system. While the formal system was manual, the informal was verbal. The former was competitive, the latter cooperative. The formal system was individualized and motivated by fear. The informal system sought solidarity and security through socialization. In many factories, piecework has been long abandoned, and time and motion studies are described as the problem. Worker participation and problem solving is today’s so-called “best practice,” together with quality circles with workers thinking and improving on the job in one continuous process of learning.

*Trade Unionism as a Response to Formal Industrial Management*

Great Britain and the U.S. were the first to industrialize, but as others followed with lower wage rates, wages were held down or even reduced (Blackford, 1988). One result was bitter industrial strife and use made of Pinkerton detectives and industrial spies so that workers spoke in a so-called “Ford whisper” to avoid being denounced to managers (Meyer, 1981). Industrial relations became politicized with the U.S. Democratic Party and the U.K. Labor Party allied with the union movement and the Communist Party tracing its origins to the revolt of the industrial proletariat.

Part of the problem lay in the way industrial disputes were formalized. In the U.S., the National Labor Relations Act gave unions the right to bargain over pay and conditions of work, enshrining the zero-sum conflict between management and labor. Today, manufacturing constitutes only about 11%-12% of the U.S. and British economies and a major source of faster economic growth may have been lost. In contrast, China’s manufacturing expansion has rescued some 600 million people from poverty.

What unions stood for, higher degrees of participation in the workplace, workers’ rights and social engagement with their fellows, have been adopted by some major competitors and harnessed to productivity. For example, when Japanese managers rehired workers fired by

General Motors for the joint venture NUMMI in the U.S., the plant went from the company's worst to the best with most of the same workers. Similarly, Nissan's car plant in Sunderland, U.K. is one of its most productive. The U.S. and the U.K. have repeatedly failed to offer workers the psychological satisfactions their unions gave them. In contrast, in Germany unions are a major source of inspiration on what cooperative industrial relations can accomplish. Management provides them with offices, and they have legal representation on company boards.

*Immigrant Communities and the Informalities of Networked Relationships*

One of the abiding puzzles of innovation is the extraordinary, but rarely explained, contribution of the networked families of recent immigrants. The Chinese *diaspora* would, if combined, constitute the fourth largest economy in the world, ahead of Germany. In the Philippines, a Chinese population of around 3% contributes about 70% of wealth, which is similar in much of the Asia Pacific (Chen, 2001). When Indian immigrants were expelled from Uganda, the economy came close to collapse and the U.K. benefitted from giving them refuge. As recently as 2000, one-third of Silicon Valley's entrepreneurs were found to be Chinese and Indian immigrants entering the U.S. since 1971 and who contributed U.S.\$50 billion to the economy (Saxenian, 1999).

It is not simply immigrant groups, but minority sects and groups within the nation which are important. The English Quakers contributed to the industrial revolution 40 times more than their numbers warranted (Hurst, 1995). Over half of Britain's great entrepreneurs were nonconformists in a nation where only 6% were thus affiliated (Everett Hagen and Massachusetts Institute of Technology Center for International Studies, 1962). French Huguenots, although only 10% of the population, were at one time forbidden to emigrate so substantial was their economic importance.

Why this outsize contribution by foreigners, dissenters, and informal rebels against the nations' formal rules? What is it that "strangers-in-a-strange-land" possess which is so precious? One reason is that in order to survive, such people need products in addition to their personalities. The latter will not suffice among strangers. Another reason is tightly networked communities as there are only a few others on whom their economic survival depends. Were they to cheat any of these or even get into a dispute, it would quickly be all around the community? It is for such reasons that debts incurred by a Chinese father will be paid off by his children; the honor of the family is at stake. Furthermore, such networks may have their own credit unions and highly respected elders to resolve disputes, thereby saving on lawyers and bankers. The discrimination such groups suffered served to tighten their bonds and increase the fairness of their dealings with each other.

In some cases, group norms seem to have made much difference. Quakers refused to shed their hats to dignitaries, tithed themselves to train apprentices, had women run meetings, and declared: "My word is my bond." This allowed them to found many financial institutions, where Barclays and Lloyds were Quakers, as were Cadbury, Rowntree, Fry and Terry in a

virtual monopoly of U.K. confectionary, Bryant & May matches, Clarks shoes, and the biscuit firms Huntley & Palmers. and Carrs. Yet less than 0.1% of British people in 1851 were Quakers.

*Family as the Origin of New Business and Its Guiding Metaphor*

Most new businesses originate with families and they are the means by which families survive. Companies started by individuals with the help of venture capitalists are a small, even if important, minority. Even where a company is publicly owned, its family origins may loom large and its norms may be those of a family. Companies like DuPont and Johnson & Johnson retain family-type cultures, as do many of the large *chaebols* in South Korea and companies in other parts of Asia (Rowley, 2013). In Asia especially, the family spirit is a major source of informality (Redding, 1990). In Chinese and Japanese companies, the metaphor of the family is everywhere with elder and younger “brothers,” “fathers,” “uncles,” and “aunts,” etc. Indeed, the nickname of Japan’s Ministry of International Trade and Industry (MITI) is “worried auntie.”

One advantage of informal family networks is that they greatly reduce the role of the welfare state and cultures of entitlement in much of Asia. Communities arrange for members who would otherwise be destitute to supply them with some useful service and coach them into doing this well so as not to become a disgrace to their family. The isolated dependent person is rare. Cross-shareholding in your neighbor’s business is common and so there are many with a stake in your survival that will help if needed.

The idea that business is an exercise in impersonal and calculated rationality, made famous by Weber, turns out to be a largely Western conviction (Weber and Parsons, 1930). The contrast between *gemeinschaft*, the primary group of intimate, informal, family cooperation and *gesellschaft*, the secondary group of detached, strategic, formal competitiveness, is a stereotype largely confined to Europe and North America. While much of the West regards innovation as being motivated by the desire for gain and personal fulfillment, for much of Asia it is a matter of family survival.

*Informalities of Lending Relationships*

Such popular movies as “It’s a Wonderful Life” reveal that lending relationships in an intimate community were once the bedrock of retail banking. The lender needs to know and care about the borrower and whether they are able to repay the loan plus interest. Personal knowledge as to the good character of the borrower is a vital ingredient without which systemic collapse occurs, as happened in the post-2008 subprime mortgage disaster where lending relationships were predatory and deceitful and led to the Global Financial Crisis. As Tett (2009) reminds us, the word “credit” comes from *credire*, to believe and without genuine belief the system cannot stand. The fact that formal relationships are rooted in informal knowledge and in mutual understandings, has rarely been better illustrated.

In large parts of the developing world, banks cannot afford to deploy loan officers. There is not the volume of business to pay their salaries, the lending is too little, and the information

too sparse. What has happened instead is that local members of the community organize networks of borrowers and recommend these to the bank as a group of persons prepared to underwrite each other's debts and guarantee the integrity of their membership (see Prahalad, 2005). Similar informal groups of guarantors were organized by the Grameen Bank in Bangladesh and became the basis of microfinance (see Yunus and Jolis, 2001). This went to considerable lengths to persuade poor Muslim women to take out microloans in a country where even approaching them is taboo. However, the informal support group of local women plays an active role. If the first woman to borrow repays on time, then others in the group will become candidates for similar loans. The money is only given to those who keep their dwellings in good repair, provide outdoor toilets, and send their children to school. It is very much in the interest of these groups of supporters to ensure the loan is repaid on time and 97.5% of loans are repaid, allowing the bank to profit, award scholarships, distribute mobile phones, etc. However, much microlending can fail, especially where these informal relationships are not in place and where the bank's chief concern is to make money, rather than "right wrongs."

#### *Role of Human Emergencies in Formal Wealth Creation*

Developing countries face a constant stream of emergencies with which both communities and authorities must try to deal with on an urgent basis. Such desperate expedients nearly all start as informal reactions. In large parts of India, sizable numbers suffer from cataracts and the lack of iodine in sea salt, which is lost during distribution. Yet, if we look at Prahalad (2005), we find opportunities even here. As the bottom of the pyramid is very broad and consists of millions, a product affordable to this group is affordable to everyone else and has near universal appeal. Since a few seconds of laser surgery can remove cataracts, India now does this on an industrial scale, using thousands of surgeons and charging U.S.\$50 to those who can afford it, while those who cannot are treated free. There is huge "profit" in this to the nation, if not to shareholders, since those formerly blind and dependent on others are freed to work, which also frees their careers. Similarly, Hindustani Lever treats sea salt to preserve its iodine, and inexpensive ice cream nourishes the calcium in the bones of millions of children.

Indian pharmaceutical companies are in many cases the world's chief bastions against pandemics which North American middle-class medicine is not geared to meet. Getting enough generic drugs to enough people in time is the aim of public policy. Once again, the looming threat of global epidemics has triggered formal profit-generating activities.

#### *Town and Village Enterprises (T.V.E.s) in China*

The real success story for China since the mid-1980s was not the State-Owned Enterprise sector that shrank and struggled (although a handful deemed strategic have prospered) nor transplanted Western companies, but T.V.E.s. These began as informal trading relationships at the level of the small town or village, which then grew larger and were legitimized, after the fact, by local officials who frequently acquired stakes in them and awarded contracts to them on behalf of the

community. In this way, enterprises tend to shape regulations rather than regulations shaping enterprises. What is convenient for the family and locality comes first.

The process began when families of farmers wrote a petition in their own blood (or perhaps red ink) and offered to face punishment rather than continue with collectivization. Local communist officials backed them, and the Confucian family ethic resurfaced after years of suppression (Chang, 2011). That businesses were established before they were regulated and taxed meant that informal, spontaneous, family-based initiatives were in the driving seat of the burgeoning local economy. This is a very similar process to which Chinese ethnic communities faced in many other countries. Most got on with business in a social context that was grudging at best. In many cases such businesses are partly owned by their customers who guide the nature and quality of what is supplied, while local officials help with governance. As new and unregulated traders are constantly joining, every company must remain flexible and agile since resourceful, would-be competitors are everywhere. Shareholding is widely distributed through the neighborhood to keep customers and suppliers loyal. The secret of economic achievement has always been family nurturance in which you are loved if you excel, as pointed out many years ago (McClelland, 1958).

#### *Academic Entrepreneurs - A Roundabout Route to Riches*

One major flaw in the conventional wisdom that the world belongs to those inducted into high finance is that an increasingly important source of industrial knowledge is largely informal and derives from education, not the machinations of “moneymen.” In order to profit from science, it is usually necessary to immerse yourself in it for decades or more and exploit this knowledge. Of course, knowledge taught in universities is a formal, not an informal, activity, but in practice very few projects started within a university are spun out from there. In fact, most new enterprises originate not from *inside* a university, but from *outside* and its vicinity. Academic innovators cherry pick from neighboring universities the cross-disciplinary teams required. Most universities lack such teams, organized as they are into narrow, inward looking disciplinary silos, often with increasingly tall and thick sides, despite the rhetoric of the opposite (Rowley, 2014). It is the informal mixing and matching of different disciplines that drives innovation. Universities have the knowledge, but rarely deploy it in ways that might solve problems, although the new Allston campus at Harvard plans to change this, as does Oxford’s Martin School.

In the meantime, the growth of science-based enterprises around universities is largely an informal, emergent development. Only 75 of the 1,400 enterprises around Cambridge University are formally sanctioned university spinouts, the rest “just happened” to people who saw the chance to make ideas come alive.

#### *Cooperating with the Critics of Business*

Another kind of spontaneous informality, stimulating new business, derives from criticism by environmental campaigners. Markets are not very effective at solving environmental problems because they tend not to see much further than the short-term costs of reducing energy, pollution, and waste. Required to compete rather than cooperate, firms are unable and unwilling to meet with competitors and share the costs of complying with targets. Indeed, those who renege on promises may steal a march on rivals, as in the “Prisoners’ Dilemma” game that rewards cheating (Cassidy, 2009).

Indeed, what criticism about the limits to growth can do is to uncover ways of innovation and growth that enhance the environment. For example, it has become possible to separate organic from physical waste when a product is returned to its maker and recycled separately (McDonough and Braungart, 2002). The organic waste can be fed to microorganisms, which return it to the environment, while the physical waste goes into new, recycled products. If the ownership of the product remains with the suppliers, they can sell the use of the product by lease or rental and then have these returned to them at the end of their lives. This system is dubbed “Cradle to Cradle” as opposed to “Cradle to Grave.” The product is reborn and such products could be cheaper for the customer in addition to being less wasteful.

Another example is that while harnessing energy from the wind, sun, and tides are costlier today, the price in the future will fall as these sources are inexhaustible and renewable. So, the means of harnessing such energy can only improve over time. Energy prices, once they dip, will reduce so that we are in a race to the “tipping point” (Gore, 2009). The critics of waste, of an automobile that expends 99% of its energy moving itself, are in reality the midwives of a new generation of planet-saving products. Although it is not easy, we must detect new ways of turning crisis into opportunity amid these noisy denunciations. Once again, the informal noisemakers are an incentive to innovate.

#### *Bath Time for Archimedes*

One of the oldest stories of scientific inventiveness tells of Archimedes, scientist to the King of Syracuse, confronted by his sovereign with the problem of discovering if the gift of a crown was silver or base metals. He knew the cubic weight of silver but could not melt the crown without spoiling its filigree ornaments. How could he estimate its volume? He pondered long and hard and growing weary by the end of the day decided to take a bath and go to bed. As he immersed his body in the water, the level in the tub rose and in a flash he saw the solution to his problem. He could immerse the crown and measure the volume of water displaced and then estimate what the crown should weigh were it pure silver. He jumped from the bath shouting “Eureka, I have found it.” This story, retold by Koestler (1964), prompts us to ask if creativity is not in some part an informal activity. Archimedes could not solve his problem by staring at it in his laboratory, only by relaxing informally and taking a bath. It was when he ceased to focus on his problem in a formal manner and took time out that the answer came to him.

Claxton (1999) cites research showing that we have a clever, quick, “hare-like” brain comprised of the neocortex and a slower, ruminative, “tortoise-like” brain stem below and behind this. The relaxed, more informal brain can solve problems while we relax, sleep, or bathe so that the answer suddenly surfaces. Einstein reported cutting himself while shaving when an idea suddenly popped up. John Cleese, the actor and comedy writer tells of numerous cases where inspiration came as he and his colleagues relaxed (Cleese, 2009). You must in some degree share the mood of your audience, which is one of informal enjoyment.

### *Playing Very Seriously*

If seriousness has everything to do with formality, then surely play is informal, fun, and indulged in for sheer enjoyment. To play at something is not to confront its reality, but to simulate it. According to Schrage (2000), innovation is all about “Serious Play” or as we prefer to call it “Playing Seriously” because the play comes first. Play has a second meaning, one which is less childish and frivolous, which is play as if in a theatre or on stage. This may be one of the hallmarks of civilization since it enables us to examine matters of life and death without the reality of dying. Events that might traumatize us were they real can be examined without suffering, save vicariously. We can see appalling scenes and ask how and why these happened and consider how best to avoid them. Tragedy evokes protest against certain aspects of the human condition. This process examines some the deepest questions of human existence.

What playing does is permit us to rehearse for “the real thing.” What might we do if faced with this situation? It also enables us to prepare a new product or service and see if we would fail if we launched it without further alterations. It is much better to fail while simulating than during the final launch and having customers reject you. Not only should playing be fun, mistakes should also be as inexpensive as possible. Simulating reduces this cost. At the rehearsal stage, mistakes can be instructive and teach you much.

Playing and watching plays allows us to learn from mistakes others have made. Since only a few new businesses make it to success, learning why most failed can prevent repeating at least the more common errors. To experience these in our imaginations may be to avoid committing them. Reportedly, the Dyson vacuum cleaner went through 2,000 prototypes until James Dyson was satisfied. Also, Thomas Edison is credited with the remark about his light bulb: “I have not failed. I have discovered one thousand ways in which it will not work.” Failures are the informal preludes to success.

### *Errors that Precede Corrections*

One way in which the logic of business differs from science where propositions are tested and face falsification, is that business cannot avoid making mistakes. Business is forced to take action before all the information is in and then corrects errors after-the-fact. Business cannot afford to await the certainty of what it proposes and must risk being wrong and then pick up the pieces afterwards. If you wait until you are completely sure, then a competitor may make the

first move and gain advantage. Even an imperfect product may mean you win over competitors and are seen as leading the industry.

The process of making errors will inevitably be seen as informal. You err privately in order to be correct before the public gaze. No one rejoices in being wrong yet being confounded may be a vivid and memorable way of learning. To be surprised, even shocked, by events is a mind-altering experience. “We only learn from negative feedback” (Hampden-Turner, 1981) is a statement not without insight. While being vindicated can be satisfying, it is our mistakes which alter our perspectives. There is a lot to be said by increasing the number of events described as “errors.” If your mistakes are one in a million, you may fall asleep before an error is encountered. If your mistakes are one in three, you are constantly struggling to reduce these and remain fully alert to the challenge.

It is a simple matter to increase the number of “errors.” You can raise your standards so high they are difficult to attain consistently. Also, you can innovate constantly, which means you are rarely right the first time. Indeed, the process of continuous improvement advocated by Deming (1982) and his followers requires continuously raised standards and unending experiments aimed at improvements. There is no end to quality improvement. Shrage (2000) quotes the verse.

“The road to wisdom, yes it’s plain  
And easy to express  
You err and err and err again  
But less and less and less.”

This is the logic of successive informal approximations to an ideal. Yet, we must be careful not to assume that the ideal is always right and the deviation always wrong. Maruyama (1963) speaks on a deviance amplifying feedback. In this event, you introduce a random element to produce a scattershot of evolutionary differences, some of which may be selected by customers, a deliberate introduction of informality into the system.

*Happy, Informal Accidents and Formally Prepared Minds*

Yet another source of informality that shapes innovation is sheer chance. The Theory of Evolution has impressed upon us “chance” through the random mutation of genes and accidents. Except that it is not accident alone. Beautiful and powerful creatures are selected as mates. Darwin was more comfortable with selection by tooth and claw than selection by sexual appeal, but the latter is decisive. It makes as much sense to say we choose as that our fates are decided. In practice nature throws up myriad forms from which we are enabled to choose “the best,” so that fate and choice complement each other, thus we formalize the informal through selection.

However, there is a tendency to downplay the role of chance, especially in the West. Here we tend to think that free choice should take all the credit and that we denigrate this by

emphasizing fate. Yet, if chance enriches variety and variety stimulates choice, then both these values promote each other. Once we choose our most attractive companions, their genes are likely to be passed on to offspring so that chance becomes choice, nature and nurture intertwine. This is never truer than when we are innovating. If we examine accounts of how new ideas were hatched and products developed, the role of sheer luck looms large. You are in the right place at the right time, a book falls open on just the right passage, an investor helps you start your car on a cold night, you sit down on a test tube by accident and it sizzles, a reaction you have long sought.

However, these random and informal events are not the sole reasons for success. You must know what you are looking for. “Fortune favors the prepared mind” as Pasteur put it. You need to recognize luck when it arises and unless you are alert to its significance it will pass you by. We often see things without discovering them. In one sense we make our luck through our determination and the lucky break comes only to determined persons. Yet, there is no doubt that innovation is messy, and the mess derives from a host of fortuitous circumstances.

#### *Reconstructed Logic Versus the Logic of Discovery*

Kaplan’s (1964) classic work contrasts two logics, a very formal one and a quite informal one. The scientific method, or hypothesis and deduction, are not in his estimate how things are actually discovered. They are reconstructed *after* the fact in order to *verify* that what we believe we have discovered is actually true. Our discovery must meet the test of falsification and be capable of replication by others so they can see for themselves the claims made and achieve the same results.

Nevertheless, many write Ph.D. theses as if the scientific method were the only way to proceed and cold precise logic and procedure our only guide. Some books expose the truth, such as Watson (1968), which tells of the workplace culture, with all its backbiting and petty jealousies, which discovered the DNA molecule. This revelation was deemed so shocking that even 10 years later the President of Harvard prevailed on Harvard University Press not to publish it. Among the controversial issues the book exposed was that the double helix was a vision in the minds of the model makers some time *before* it was proved to account for all the observations. Insight, guesswork, faith, belief, and aesthetics had all played a part in the discovery. It was not a simple extrapolation from the facts. It was an intuitive leap, an inspired hunch.

Many useful products are never properly formalized in scientific terms and when or if they are formalized, this used as an excuse to take them away from 800 years of practice by folk practitioners as an infringement of patents. We may know that something works, like aspirin, but not know *why*. Too often we confuse verification with discovery and because holistic medicine is very hard to verify, since there are too many variables, it tends to be discounted despite centuries of use.

### *Diverging Informally and Converging Formally*

The psychological researchers Getzels and Jackson (1962) compared the thought processes of students and discovered that “creative” students *diverged* in their thinking processes. Asked about “the uses of a brick,” those thinking in convergent styles would give formal answers like “building a house or wall” while those thinking divergently would respond “a tombstone for a mouse.” It was among divergent thinkers who *later converged on something new* that innovation was found. If we examine a problem-solving team, their members first brainstorm or free associate with multiple ideas and then reach a solution before the time runs out. This is a process of diverging informally and then converging formally.

Hudson (1966) traced this difference to the “two cultures” described by C.P. Snow. Students of liberal arts tended to diverge in their thinking and students of the sciences tended to converge. This was because there were known answers in the hard sciences, but not in the liberal arts. However, innovation requires both kinds of thinking, reformulating basic questions to derive new answers. Nevertheless, it is clear that informal divergence must *precede* formal convergence in the same way that discovery preceded verification in our previous point and accidents preceded seizing upon these in the 13<sup>th</sup> illustration. Informality comes first.

### *Formal Economies of Scale and Informal Economies of Scope*

Economies of scale have had a large influence and produced huge payoffs through the formal design of the workplace as a giant machine. The more products that could be mass produced and mass marketed, the lower their costs and the more people could afford them. Ford said famously that customers could have any car color so long as it was black. By doubling wages, his workers could afford to buy the cars they made. China’s competitive national advantage is not unconnected to its mass market of 1.2 billion people. It is a low-cost producer, but this is not the only competitive advantage.

There is a second, more informal advantage, that of producing a unique premium product that no else can match (Porter, 1980). Here the supplier creates something so rare, personal, and customized that its equivalent exists nowhere else and the supplier has a virtual monopoly. This is accomplished through economies of scope. While Porter (1980) urged us not to confuse these two but to concentrate on one or the other, closer examination shows that they can be advantageously combined with one another. Standardization is, indeed, powerful, but so is customization and personalization.

The first point to grasp is that economies of scale do not necessarily obviate economies of scope. These operate at different levels of abstraction. At the *component* level it is possible to order standard components by the million and standard bricks for a house and build these into unique architectural designs. The fact that the pieces are uniform does not mean that the completed structure at the level of *configuration* cannot be original, unique, and customized.

Indeed, were the components not standardized, this customization would cost the customer considerably more.

The finished product may be the only kind in the world and so completely informal, while the bits and pieces from which it is made are all formal routine items that can be picked up from most distributors. An example of this process is Dell, which does not make computers but assembles them to order. It orders components in huge quantities to keep costs low and a complete IT system monitors its strategy, every part having been joined to this larger, purposive system, with websites that record and describe all transactions and inventory levels replenished just-in-time. Economies of scale and scope have been fused in an informal synthesis of formalities. Production of a Toyota Lexus follows a similar procedure. The basic chassis and wheelbase are mass produced and standardized for all its vehicles, but the Lexus is customized after being ordered from a showroom. The precise combination of optional features is assembled to order within days and then delivered, a near unique synthesis of standard components.

#### *Shock of Recognition - Freshly Configured Formalities*

Koestler (1964) famously observed that innovative and creative activities give to us a *shock of recognition*. This is a paradox, but an important one. At one level we get a shock because this has never been seen before, and at another level we recognize its value and, therefore, wish to acquire it. Without the shock, our interest would not be aroused and without the recognition, our wallets would not be opened. Were it something wholly new, the chances are we would not recognize it at all as being of value and were it wholly familiar we might not notice it at all.

We provide another example of this. Suppose a few years from now an electric car came on the market with the range, speed, and performance of a piston-engine car, but at significantly lower cost to the environment. The recognition would come from these equivalent performance characteristics; the shock would come from the fact that an electric car can now deliver this with significantly lower pollution levels. If we did not know what an electric car was or could do, this lack of recognition would kill it. Part of the recognition comes from knowing yourself. If saving the planet is important to you, then this is part of the recognition. Innovation is in part strange and in part familiar.

#### *Informalities of the Creative Class*

There is a growing body of evidence that North America and some other parts of the world are developing informal cultures that support a creative class of innovators and high tech industry generally (see Florida, 2004). About one dozen urban centers provide around 70% of North America's innovation. Without Seattle, Silicon Valley, the Bay Area, Cambridge-Boston, Austin-Texas, Boulder, Colorado, New York City, and parts of Los Angeles, there would be very little innovation.

What characterizes these parts of North America are highly informal, liberal-minded, egalitarian and cosmopolitan, diverse and highly educated, urban environments. Toleration and

equality are high among these cultures. Without these values, people will not want to inhabit such areas and there will be no high-skilled creative workforce from which companies could recruit. The companies appear to be following the people, who mostly eschew formalities, save those of education and professional skills. There is a tendency to tolerate new ideas and lifestyles in general and on principle as a prelude for evaluating them.

What is increasingly clear is that values originate within key clusters in the vicinity of certain urban centers and that creatively oriented companies are obliged to locate in such communities to attract the right people. These in turn know their value and demand informal kinds of management, which encourages high freedom of expression. Loyalty is less to companies than to sets of ideas informally shared. It is “coffee bar creativity,” wherein people meet in coffee bars, share experiences, and decide to go into business together on the spur of the moment because their visions are similar.

Startups of the kind around Cambridge in the U.K., Boston-Cambridge, and Palo Alto in the U.S. are of course informal by definition. Employees may have no salaries and simply share the fate of a new technology they are each taking a part in. People in such companies are typically on a first-name basis and cohere informally through personal knowledge. It is no coincidence that these are much more innovative than larger companies.

It is widely canvassed that Silicon Valley grew out of the Berkeley student revolt of 1964. Certainly, Steve Jobs made no secret of his hostility to IBM and its mainframe computer. The Apple 1 was a tool of personal liberation that gave power to the person, as was “management by wandering about” in Hewlett Packard, a process of canvassing the best ideas among creative employees. Once again we see that informality is a major seedbed of innovation.

#### *Closed, Internal, Formal, R&D Versus Open, External, Informal Relations with the Wider Ecosystem*

The conventional view of innovation is via R&D. This made a lot of sense when IBM employed the majority of computer scientists in the U.S. and could afford to pay them better than anyone else. It makes less sense when 95% of the experts are outside. Formal R&D grows out of formal education and tries to extend this. To call this “closed innovation” is perhaps unfair since all innovation is open at the moment of conception. However, closure comes soon after the innovation because the company wishes to keep its new developments secret from competitors. Even suppliers may not be told what will be done with what they supply, lest information leak out. The result is that they can do little to help customers who have kept them in the dark about daring plans.

There are several problems with innovation driven largely by R&D. One is the “Not Invented Here” syndrome, a tendency to overvalue what is done internally and undervalue what is done externally. This is particularly serious where the output of small creative companies is ignored. These are usually more generative of innovation than larger companies, as we noted

earlier. A second problem is that R&D comes to be regarded as the sole repository of “genius” in the company, with everyone else in a supportive role. R&D may even forbid entry by other members of the company. The third problem is that innovation is seen as something pushed inside out, not outside in. A fourth problem is the relative neglect of *process* innovation, making the same product but in better, cheaper ways. R&D typically concentrates on product innovation alone.

In contrast to closed innovation is open innovation (see Chesbrough, 2003). This is far more informal and may include numerous suppliers who are told what the company plans to do in enough detail to know what they might contribute to this, including their own R&D expenditures. For example, a manufacturer of solar roof panels needs to know the prospects for greatly improved photovoltaic cells or a new form of heat-absorbing raw material better able to convert sunlight. Contributions from suppliers are especially important where these are in electronics since many innovations in many different industries derive from new electronic devices. New robotics or LEDs may also revolutionize the appeal of a product. To keep suppliers in ignorance is to miss many opportunities for product improvement, even radical transformation, and innovation.

If we define innovation as a novel combination among components, then a supply chain provides hundreds of these and their numbers greatly increase the chances of new combinations being found. The place to innovate is where all these ingredients meet. Suppliers cannot know of their potential to assist unless they are informed of their customer’s vision, however risky this might be.

Open innovation is much more than opening up to members of the supply chain. Proven innovators may be allowed to examine patents, as Philips did with thousands of its unexploited ideas. Small, innovative companies may be acquired and supplied with patents. The company may agree to co-invest or act as a customer of the products developed or simply charge a royalty. It is better that something be done with these ideas than nothing. In addition, co-creation with customers may be proposed. Plotting the future with customers tends to bind them to the organization. Even joint ventures with competitors may be tried. In all such cases the most valuable resource is the wider ecosystem, not the R&D department, although the latter may be rejuvenated by a development outside that is brought back in-house.

An increasing number of companies have directors of internal and external innovation who meet regularly to cross-fertilize ideas. The point is that new opportunities may arise from anywhere in the ecosystem and many consultants have arisen. These arrange informal meetings, interactions and build new bridges between ever wider memberships.

#### *Advent of Crowdfunding for New Ideas*

A relatively new and informal way of investing in companies is by crowdfunding. Internet based platforms like Kickstarter inform their followers of a new idea and the crowd either subscribes

startup funds or declines the offer. The medium of this exchange is creative ideas. The proposer can seek support for an environment-saving device, for employing environmentalists, for paying suppliers within a week, for training and developing its own employees, for co-creating with its customers, and generally conferring upon the community multiple benefits. Since investors were initially attracted by these promises, they can be expected to keep the company up to the mark.

Such movements emerge from informal discussions of what is right and wrong and what more a company might do for its society. It is completely open-ended and stands to discover that where stakeholders are well-treated, a company will prosper. The wealth creating unit has expanded. Originally individual proprietors created most wealth. Then came the age of the corporation where cooperating people were found to better generate wealth. Today is the age of the industrial ecosystem wherein all stakeholders are needed to generate profits while sustaining the environment. Informal relationships among these “crowds” are what is urgently needed. Their motives are informal, prosocial, and passionate. You do well by doing good. The B-lab or Benefit Corporation is an example as is the “Conscious Capitalism” movement wherein companies pledge themselves to serve in exchange for investor and customer support (Mackey and Sisodia, 2013).

## **Discussion and Conclusion**

Virtually anything that is innovative, which is corrective, which aims to qualify the *status quo* of a culture or an organization in its early manifestations, also represents the informal. These informal currents constitute a powerful aspect of socioeconomic development even where conditions display a lack of direction or leadership or seem to offer no clear solution. We now look for sustainable development, but we can find the opposite. The anger often displayed by developing nations and the world’s poor, should be enough to tell us something is wrong. Sooner or later this informal, free-flowing lawlessness of regions under development, or in decline, will be formalized and the skill with which this is done will prove decisive in remedying or perpetuating our malaise.

We have noted that the emergent norms of factory workers were remedial and constructive in their impact, that trade unions created systems, that the networked survival systems of immigrant and sectarian communities may create new wealth on an unexpected and prodigious scale, and that the ethic of the extended family can boost rather than detract from wealth creation. We saw that bank lending relationships require an active concern and caring for the borrower and for repaying the lender or these fail, and credit is exhausted. All this draws upon on informal relationships of affection within communities. Predatory lending from exclusively selfish sources is corrosive of trust. Many opportunities to render aid both effective and profitable are possible. There are potential fortunes to be made even at the base of these pyramids and remedies there can elevate millions in dire want. Examples of what is possible

are exemplified by the success of T.V.E.s in China as well as the millions rescued from poverty by manufacturing expansion. We also considered the role of academic entrepreneurs whose knowledge-intensive innovation could yet rescue advanced and affluent economies from the cost-cutting strategies of developing nations and their low labor costs. The challenge now is to *listen* to those critics of business and devise ways of rescuing the planet. The first companies to achieve this will prosper. It is a race to the tipping point of declining energy costs. The key is to innovate.

Innovation has always had major informal components. Archimedes had to relax informally before he could solve his problem. Innovators play informally and in rehearsals for so long as this is the preparation before they finally succeed and so many errors must they correct along the way. Accidents, which are manifestly informal, are seized upon by prepared minds and discovery is a messy process. It is verification that is formulaic. Those who would create must diverge beyond the formal boundaries of their region, discipline, or profession, yet they will later converge on a new solution, which is formalized in its turn.

Of the two socioeconomic paths to wealth creation only economies of scale, with characteristic falling costs, is formal. The economies of scope, rather than scale, of the enterprise seek after the uniqueness of the customized product and cost savings (Panzar and Willig, 1981). They possess characteristics associated with the informal. So-called novelty is rarely new in its entirety since innovation needs to be recognized and must be partly familiar. Like a grammatical English sentence, old words may take on new meanings in a “shock of recognition.”

There is increasing evidence that more innovative aspects of the North American culture draw on a set of norms high in informality and liberality in which great diversities of values are still tolerated and sampled. This seems to be an essential prerequisite for an innovative mindset. Innovation today is advanced less by formal R&D and more by exploiting the hundreds of cross-connections within the industrial ecosystem in a series of fortuitous encounters. We appear to be entering an age of informality.

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