Themes of the Skilled Craft of Innovation & Entrepreneurship

Prepared initially 2010 and 2011 (with updates where noted).

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"(T)o create objects which have any kind of utility, is to create wealth; for the utility of things is the ground-work of their value, and their value constitutes wealth. …(T)here is a creation, not of matter, but of utility; and this I call production of wealth."

-- Jean Baptiste Say, 1821

Introduction

The narrative account below of themes and sources related to the skilled craft of innovation/entrepreneurship, prepared mainly during 2010-2011, is framed by a series of questions: ***"what is innovation, why does it matter, how does it happen (as skilled craft)."*** Within the account, the answers to these questions begin with early voices (e.g., Say and Schumpeter), followed by modern voices, which reinforced and built upon early themes.

This narrative account marked the first step of an unfolding process of considering the feasibility of articulating a framework of innovation's organizing principles, or fundamentals. Why would this feasibility matter? In my mind, it mattered because multiple resources led me to believe it could open up significant opportunities for innovation *instruction* within K-12 schools, with the potential result of more engagement of human talent, for more of innovation's benefits for society

Subsequent discovery of an organizing framework for understanding the creativity of *Science*[1] provided inspiration for a way to organize this narrative of overall themes about innovation and entrepreneurship: within a ***table*** that compares and contrasts the creativity of Innovation with that of Science and Invention.

The themes and sources also led to development of a **"social innovation differential,"** which is included at the end of this narrative account to preserve its content even though it became fully embedded within the table, rather than serving as a "differential."

In this document, the narrative account of themes and sources is organized as follows:

- Innovation's Function -- What & Why (Early Voices, Modern Voices)
- Innovation as Skilled Craft -- Overview of How
- Innovation as Skilled Craft -- Detailed How
    - Practitioner Purpose
    - Knowledge
    - Creativity
    - Action
- Organization of themes within a table comparing Innovation's creativity to that of Science and Invention
- Social Innovation Differential

Themes & Sources

A. Themes of Function -- "What" and "Why"

Addressing the “what” of innovation and entrepreneurship involves definition, which is a necessary but challenging starting point. That's because the most enduring aspect of definition for innovation and entrepreneurship may be elusiveness, including an absence of consistent distinction between the two terms. Each term has been associated with a large genus. However, when it comes to what has made each term most meaningful, or noteworthy, thought and action leaders have spoken consistently to the *function of resource leverage* -- that is, generating more value from the same resources or the same value from fewer resources.

The following stood out as early themes:

- *A large genus united by result of "resource leverage"*
- *Means to leverage is new customer utility, or "value," (and/or production efficiency)*
- *Standard of performance is “large” – high leverage and broad scale*
- *Developed in the commercial sector but pertinent broadly, including all economic sectors (e.g., private vs public)*
- *Precursor to knowledge-based economy*
- *An imperative within sustainable development*

1. From early thinkers: a large overall genus united by the hallmark function of "resource leverage"

In the first half of the twentieth century, economist Joseph Schumpeter described entrepreneurship as a “large genus”: “(S)pectacular instances” such as “railroad construction in its earlier stages,” the “motorcar,” and “colonial ventures” fit within “a large genus which comprises innumerable humbler” instances “down to such things as making a success of a particular kind of sausage or toothbrush.”[1.5]

Further, a large genus is consistent with what Jean Baptiste Say had established a century earlier. When Say coined “entrepreneur” as an economic term, his first example was of a knife grinder who undertook to produce without land (“self industry”).[2] However, throughout his early nineteenth century treatise, Say cast entrepreneurship as the human (or knowledge) equivalent of a new tool or machine that creates a positive shift in productivity. Instead of machinery, the entrepreneur provides “the application of acquired knowledge to the creation of a product for human consumption.”[3]

Say made limited use of the label, "innovation," typically discussed separately from entrepreneurship and without explication regarding the separation. However, Say made it clear that the function of a positive shift in yield on resources (resource leverage) is what matters most to production. This is “the acme of industry”:

> (The new tool or machine's) obvious effect is to make less labour requisite for raising the same quantity of produce, or, what comes exactly to the same thing, to obtain a larger produce from the same quantity of human labour.— And this is the grand object and the acme of industry.[4]

Further, like Schumpeter, Say's examples made clear that the highest standard for the genus of entrepreneurship was large, or "spectacular," shifts in productivity. Schumpeter described the standard as "reforming or revolutionizing" the production system, or "creative destruction."[5] Especially at this high end of the large genus, "the entrepreneur acts with confidence beyond the range of familiar beacons and overcomes resistance to change."[6]

Charting the large genus of productivity advances, with one positive axis for amount of leverage and another for extent of scale, the early, highest standard of success -- whether for a single enterprise, an industry, or an overall economy -- would seem to be high leverage and broad scale.

2. Resource leverage by way of customer-determined "utility" or production efficiency

Within Say's treatise, shifting resources from lower to greater yield occurs through:

- expanding "utility," or value, to customers with newly conceived offerings
- or increasing efficiency.

Say offered the example of silk fabric, which provided new value to customers and thereby generated the yield of more wealth from the resources used to produce silk fabric (a sum greater than the parts). New tools offer the example of a shift in efficiency, by producing the same value with fewer resources.

Say noted that aspects of each means to greater commercial yield – utility and efficiency -- placed the function of the market in the context of a broader set of societal functions. For example, when advances in utility are the source of realizing greater economic yield from resources, Say clarified that utility is determined fully by customers, leaving it to "the moralist and the practical man the several duties of enlightening and of guiding their fellow-creatures."

> "… It is universally true, that, when men attribute value to any thing, it is in consideration of its useful properties; what is good for nothing they set no price upon. To this inherent fitness of capability of certain things to satisfy the various wants of mankind, I shall take leave to affix the name of utility."
>
> "(T)o create objects which have any kind of utility, is to create wealth; for the utility of things is the ground-work of their value, and their value constitutes wealth. …(T)here is a creation, not of matter, but of utility; and this I call production of wealth."[7]

> … *It would be out of place here to examine whether or not the value mankind attach to a thing be always proportionate to its actual utility. The accuracy of the estimate must depend upon the comparative judgment, intelligence, habits, and prejudices of those who make it. True morality, and the clear perception of their real interests, lead mankind to the just appreciation of benefits. Political economy takes this appreciation as it finds it – as one of the data of its reasonings; leaving to the moralist and the practical man, the several duties of enlightening and of guiding their fellow-creatures, as well in this, as in other particulars of human conduct.[8]

Similarly, Say noted that it is a function of public management to steward a nation's *natural resources*. And for efficiency-based advances in the production system, Say noted that the advantage to the nation's "wealth," or overall standard of living, could represent temporary disadvantage to a set of individuals, as machines reduced the need for human labor. Compensating for this displacement might occur within the production system itself (e.g., via advances in total production). However, on the whole, Say depicted important complementary dynamics between a market-based production system and a broader societal system.

3. Modern Voices - Preserving Fundamentals

Modern voices have largely reinforced the continuing pertinence of Say and Schumpeter's fundamental ideas (see modifications addressed in subsequent sections). The voices of Peter Drucker and C.K. Prahalad stand out:

Drucker's 1985 primer, *Innovation and Entrepreneurship*, opens by quoting Say:

> "'The entrepreneur,' said the French economist J.B. Say around 1800, 'shifts economic resources out of an area of lower and into an area of higher productivity and greater yield.'"[9-1]

Then Drucker ends that same initial chapter with his own words repeating this same fundamental notion of the essential function of resource leverage:

> "Entrepreneurs by definition, shift resources from areas of low productivity and yield to areas of higher productivity and yield."[9-2]

With reference to definitions, Drucker also stated that the resource-leverage *change* "constitutes innovation":

> "(W)hatever changes the wealth-producing potential of already existing resources constitutes innovation."[9-3]

Similarly, Drucker reinforced Say's concept that the resource-leverage shift is made possible by customers (or "users") who determine what constitutes "utility," or value, as the basis for the shift:

> "An innovation is a change in market or society. It produces greater yield for the user, greater wealth-production for society, higher value or greater satisfaction. The test of an innovation is always what it does for the user."[9-4]

Throughout his 1985 primer, Drucker treated "innovation and entrepreneurship" as directly related to the extent that they sound mutually necessary — almost as if those three words should be read as one. Drucker casts "innovation" as a result but also as a practice, or discipline. For example:

- "Entrepreneurs innovate. Innovation is the specific instrument of entrepreneurship."[10]
- Innovation is a "diagnostic discipline" and the "knowledge base of entrepreneurship."[12]
- To move from incidental to systematic innovation and entrepreneurship involves active "search for and … exploitation of new opportunities for satisfying human wants and human needs."[13]
- "Entrepreneurs need to search purposefully for the sources of innovation …"[14]

At the same time, Drucker speaks to what he calls "total confusion" over the definitions of "entrepreneur" and "entrepreneurship" "since Say coined the term nearly two-hundred years ago."[9-5] In particular, Drucker addresses the mistakenly widely-used U.S. definition of an entrepreneur "as one who starts *his own, new* and *small business*." [9-6]

Drucker argues that none of these terms – personal ownership, new, small -– speaks to what Say described as entrepreneurship: "But not every new small business is entrepreneurial or represents entrepreneurship."[9-7] For example, opening "another delicatessen store or another Mexican restaurant" does "what has been done many times before"[9-8]:

> These new "ventures" "create neither a new satisfaction nor new consumer demand." [9-9]

In contrast, Drucker points to McDonald's as a definitive example of entrepreneurship:

> "(B)y applying management concepts and management techniques (asking, What is 'value' to the customer?), standardizing the 'product,' designing process and tools, and by basing training on the analysis of the work to be done and then setting the standards it required, McDonald's both drastically upgraded the yield from resources and created a new market and a new customer. This is entrepreneurship."[11-1]

Drucker also distinguished innovation from invention or technology:

> The container ship “did not grow out of technology at all but out of a new perception of the ‘cargo vessel’ as a materials-handling device rather than a ‘ship.’“ … “But this humdrum innovation roughly quadrupled the productivity of the ocean-going freighter and probably saved shipping.”[11-2]

> “‘Innovation,’ then, is an economic or social rather than a technical term. It can be defined the way J.B. Say defined entrepreneurship, as changing the yield of resources. Or as a modern economist would tend to do, it can be defined … as changing the value and satisfaction obtained from resources by the consumer.”[11-3]

John Seely Brown made a similar distinction in an edition of the Harvard Business Review, dedicated to the topic of innovation:

> And this is what we mean by “innovation”: invention implemented.”[101]

Prahalad elaborated on the centrality of resource leverage:

> "All entrepreneurship is about aspirations greater than resources."[16]

> "It’s not enough to get to the future first, one must also get there for less."[17]

Also, in *The New Age of Innovation*, Prahalad and co-author M.S. Krishnan not only reinforced the enduring principle that customers determine utility, they extended it to the degree of “N=1,” where the variable “N” represents the customer, and “N=1” means that production must consider every individual customer’s needs (along with the full set of global resources as the relevant set of resources).[18] Most noteworthy, Prahalad and Krishnan described N=1 as representing "a movement in process," "not a choice."[19]

Both Drucker and Prahalad called for practicing innovation and entrepreneurship both broadly and systematically, including arguing that the practice pertains at least as much to large and existing enterprises as to small and/or new enterprises (as did Say and Schumpeter). Drucker held that larger, existing organizations have more resources for innovation and entrepreneurship, and Hamel and Prahalad declared a fundamental premise that the “the age of incrementalism is over.”[20]

4. Modern Voices - Beyond standard commercial system

In addition to preserving fundamentals, modern voices have offered new perspective regarding where innovation and entrepreneurship can (and should) occur.

In addition to all sizes of business, Drucker and Prahalad argued for including the practice of innovation and entrepreneurship beyond the standard commercial system. With the conception of the “base of the pyramid,” Prahalad presented a vision of viable commercial potential within the developing world, as one intelligent means to economic development.[21]

Drucker departed in yet another way, by holding that the *yield* from resource leverage does not need to be economic – only the *resources*:

> "Say was primarily concerned with the economic sphere. But his definition only calls for the resources to be 'economic.' The purpose to which these resources are dedicated need not be what is traditionally thought of as economic. Education is not normally considered 'economic' … But the resources of education are, of course, economic." [22-1]
>
> "Hence entrepreneurship is by no means limited to the economic sphere although the terms originated there. It pertains to all activities of human beings other than those one might term "existential" rather than 'social.'"[22-2]

Drucker used the term "social innovation" throughout his 1985 primer and argued generally for broad pertinence of the practice of innovation and entrepreneurship:

> "… (I)nnovation is an effect in economy and society, a change in the behavior of customers, of teachers, of farmers, of eye surgeons – of people in general. Or it is a change in how people work and produce something."[23]
>
> "There may be greater scope in the U.S. for social innovation in education, health care … than in business."[24]
>
> "What we need is an entrepreneurial society, in which innovation and entrepreneurship are normal, steady, and continuous."[25]

Echoing Drucker's observation that Say only called for the *resources* to be economic, Stephen Goldsmith published in 2010 a book called *The Power of Social Innovation*, in which he spoke of the "social production system."[25.5]

5. Modern Voices - In Knowledge-based Economy, Capitalism and Society are Interrelated

By 1993 Drucker strengthened his admonitions for broad and systematic applications of innovation and entrepreneurship within the context of a "post capitalist" society, in which knowledge is the only meaningful resource. His essential message: Learning to use knowledge toward advancing productivity, which all organizations must do, means learning to practice innovation.

The skilled-craft practice of innovation and entrepreneurship might be viewed as the precursor to knowledge work practiced effectively in the post capitalist society:

> "(K)nowledge is the only meaningful resource today … The resource we now consider knowledge proves itself in action … These results are seen outside the person – in society and economy, or in the advancement of knowledge itself.

> The traditional ‘factors of production’ – land (natural resources), labor, and capital – have not disappeared, but they have become secondary. They can be obtained … provided there is knowledge. And knowledge in this sense means knowledge as a utility, knowledge as the means to obtain social and economic results.
>
> Every organization of today has to build into its very structure the management of change…
>
> Every organization … will have to learn how to innovate – and to learn that innovation can and should be organized as a systematic process."[26]

Drucker’s words might be seen also as a precursor to Clayton Christensen’s later description of innovation as *“integrating and applying knowledge*.”[26.5]

In this work, Drucker was explicit in reinforcing and even strengthening his case for innovation in the social and public sectors, as he held that the post-capitalist stage “changes fundamentally the structure of society.” “It creates new social and economic dynamics. It creates new politics.”[27] Capitalism and society are fundamentally interrelated. *Note the relative contrast on this point with Say from a century earlier,* where Say described complementary but separate dynamics between a market-based production system and a broader societal system. Drucker wrote:

> "Social innovation is as important as new science or new technology in creating new knowledges and in making old ones obsolete. Indeed, social innovation is often more important."[28]
>
> "Government … is going to be the most important area of entrepreneurship and innovation over the next twenty-five years."[29]

Drucker’s ideas from the 1990s and early 2000s heralded dynamics that have been associated increasingly with challenges of U.S. capitalism in relation to society (e.g., in 2011, increasing circulation of ideas such as Michael Porter’s conceptualization of “shared value” within the context of “rethinking capitalism” and McKinsey & Company global managing director, Dominic Barton’s, view regarding capitalism for the long term).[30] Similarly, designer Roberto Verganti has advocated for moving beyond user-centered design to what amounts to forward-centered design. Similarly, from Mihaly Csikszentmihalyi:

> "The changes technological inventions have brought about have increased the range of our options, but each has presented a bill that must be paid. The most important challenge that confronts us now is learning how to assess the pros and cons of the fruits of our imagination."[30-5]

(Update: By ~2013, the related notion of “responsible” innovation had taken hold – e.g., used by Michael Crow at Arizona State University.)

6. Emergence of Social Entrepreneurship Movement

As of the 21st century, within the context of recent broad visibility of activity labeled “social innovation” and “social entrepreneurship,” leaders of thought and action have reinforced both urgency and the crucial and fundamental function of resource leverage within the “social production system”:

> "The social entrepreneur asks, 'What is the most highly leveraged way that you can help speed up the change process?'"[31]
>
> "The (social) entrepreneur engineers a permanent shift from lower-quality equilibrium to a higher quality one."[32]
>
> "(High-impact) non-profits use the power of leverage to create tremendous change …They influence and transform others in order to do more with less."[33]

The measure of “doing good” is creating resource leverage – where the societal benefit may or may not include wealth. Organizational form is secondary: “These approaches could be pursued through for-profit, nonprofit, or hybrid organizations.”[34]

7. Innovation within Sustainable Development and “Renewal”

Finally, the societal issue of *sustainable development* prompted a global-level imperative of innovation, which by virtue of its size alone blurs boundaries between the commercial and social production systems. Within a 2007 panel discussion held at the University of Michigan, entitled, ”Is Consumerism Sustainable?” the panelists concurred that “innovation” is the answer … “either gradually or by crisis.”[35] It is up to innovation to advance yield on natural resources to at least maintain the standard of living among developed populations while also improving the standard of living among developing populations. Together, these can be viewed as opposing imperatives, and Jeffrey Sachs adds that “political will” will need to complement innovation.[36]

John W. Gardner and others used the term “renewal” in the second half of the 20th century to refer to “not just innovation and change”… but “also the process of bringing the results of change into line with our purposes.” Gardner noted too: “The only way to conserve is by innovating.”[37] In 2011, the notion of renewal became an active element of dialogue among leading voices regarding sustainable development.

As society at large began acknowledging an overarching and pressing need for resource leverage, it seemed that one important, if not essential, lever for addressing the need would be deep and shared understanding of the practice of innovation and entrepreneurship and its relation to resource leverage. Instead, the terms have become omnipresent, but fundamental and shared understanding has not.

B. Themes of "How" – Methodology as Skilled Craft

[Note, this section begins to use "innovation" in place of the combination of "innovation and entrepreneurship."]

What are the fundamental aspects of what leading practitioners do as skilled craft – likely tacitly – to offer new value to customers as a catalyst for resource leverage? How and why do they do it?

Enduring, thematic *fundamentals* of the practice of Innovation as skilled craft include:

- *Innovation's "medium of expression" is generating and acting on ideas for compelling new customer value (value that achieves resource leverage).*
- *Practitioners seamlessly integrate a set of fundamental elements in the work of generating and acting on ideas for new customer value for customers.*
  Day to day, as a way of life, action is informed by purpose/motivation; knowledge; and cognitive/creative processing.
- *The particularities of each element seem as important as their integration.*

To inform action, key elements of innovation's practice as skilled craft are integrated: purpose/motivation, knowledge, and cognitive/creative processing:

Purpose/Motivation – Successful practitioners achieve resource leverage, but the conscious purpose that guides their work may be more about achieving positive "change" in a specific domain by way of putting new "value" (e.g., a new approach to housing or news or matchmaking or learning or voting, etc.). Typically, the domain of change reflects *practitioner* values or interests.

Knowledge -- Pertinent knowledge is not necessarily elite or even consciously held; it might be ordinary and/or tacitly held. Four thematic strands of knowledge are pertinent:

- *industry/domain*
- *customers*
- *general human and social dynamics*
- *"anything and everything*."

Cognitive/Creative Processing -- In contrast to wide variation in pertinent knowledge, the thinking in innovation's practice draws fundamentally upon higher-order processing. Critical, creative, and practical thinking are combined, including within a type of imagination that features "the ability to see possible … connections [of existing knowledge] before one is able to prove them in any way."[38] New connections amount to *hypotheses*, such that innovation practiced as skilled craft shares with science and invention the *essential creative structure* of hypotheses.

Given innovation's function of resource leverage and catalyst of new value, its hypotheses speak to “what could be as new value to customers” and "how it could become (an offering that catalyzes the change of resource leverage in the production system). Innovation’s hypotheses fit within its “medium of expression” – generating and acting on ideas for compelling new customer value. This contrasts with hypotheses of science, aimed at advancing knowledge about “what is” and with invention's hypotheses regarding "what could be as new technical capability."

Innovation’s hypotheses, which may originate in early, undeveloped form and may even be subliminal, serve as a bridge to action:

Pertinent Knowledge --> Vision of What Could Be & How --> Action

The vision may change or adapt, even frequently, but there is, whether tacit or explicit, a vision informed by hypotheses about new customer value.

Further:

- Because an hypothesis for new value incorporates industry/domain knowledge and customer knowledge, initial ideas may imply at least a foundation for how to realize the vision. For example, when Wendy Kopp conceived of Teach for America, she realized that the idea would rely on a college recruitment model that would feature the early, aggressive, and selective characteristics of investment bank and consulting firms' recruitment of the same talent pool.

- Because the cognitive processing that leads to such a vision is based on new connections of existing knowledge, an “effective” new connection can be as compelling to others as it is to the conceiver. Bruner described that new connections are “beheld” commonly; anyone who understands the elements connected can see the new combination.[39] It is both new and noteworthy: “The triumph of [paradigmatic imagination] is that it takes one beyond common ways of experiencing the world.”[40] However, in short order the surprise takes on a quality of obviousness.[41]

With the example of Facebook (in ~2010), Time Magazine noted: “Facebook employees get treated well … but make no mistake: the main attraction is Zuckerberg’s vision.” Time quotes a current vice president “who was doing a master’s in artificial intelligence” and initially thought Facebook would be a waste of time:

> "And the interview completely changed my mind. I saw the vision. I came in, and I saw it on a whiteboard."[42]

Bill Drayton, to whom the term “social entrepreneur” is attributed, describes any entrepreneur’s vision as an active process of “how tos”:

> "Take a how-to issue – “How are you going to solve this problem?” – and push them from the first to the second to the third to the fourth level of the challenge. The real entrepreneurs love that. Because that’s what they

> spend their time thinking about in the shower in the morning and they don't have anyone else they can talk to about it."[44]

The "how to" attributes can make an idea all the more lifelike and guiding to all who participate in acting on it. Clayton Christensen and Michael Raynor describe that "innovative ideas emerge in half-baked formed," but a deliberate vision is underway.[45]

Although the highest standard for results is high leverage and broad scale, the same fundamental integration of elements generates any amount of leverage, from modest amounts to "creative destruction."[46] Again, Drucker argued that innovation and entrepreneurship "pertains to all activities of human beings other than those one might term "existential" rather than 'social.'"[22-2]

Even if a new innovation hypothesis (either "what" or "how") emerges in a flash of insight and even if only tacitly held, it is grounded in pertinent knowledge. Hypotheses constitute innovation methodology's basic structural unit (essential creative structure). These hypotheses suffuse the skilled craft throughout all phases and tasks – not only for breakthrough ideas about "what could be" (as new customer value) but also for "how it could become," including the day-to-day tasks that turn an idea into a reality.

For example, "LSD millionaire" and entrepreneur, Augustus Owsley Stanley III, is said to have built his (at-first legal) business on the initial, foundational insight (hypothesis) that others would share his personal interest in knowing the source of the product. But this essential "what could be" hypothesis for value to Stanley's customers was integrated with wide-ranging how-to ideas that led one observer in 2011 to compare Stanley's "entrepreneurial qualities" to those of Steve Jobs:

> "Like Mr. Jobs, Mr. Stanley was fanatical about quality control. …
> Owsley LSD was curated like a varietal wine and branded as evocatively as an iPod — "Monterey Purple" for a batch made expressly for the 1967 Monterey Pop festival …"[47]

Integration as "Style of Thought" --

The integration of the fundamental elements of innovation practiced as skilled craft may amount to what educational psychologist Jerome Bruner called a "style of thought":

> "It may well be that the style of thought of a particular discipline is necessary as a background for learning the working meaning of general concepts."[48]

Bruner offered the example of "function" as an organizing concept in biology, where increasing experience with the subject can bring the meaning of function increasingly to light.[49] For innovation, "change by way of value" or "leverage" may represent a similar organizing concept, where increased experience with the practice could bring the meaning of resource leverage increasingly to light, including its dependence on customers' perception of new value.

“How to” is another possibility for a distinguishing style of thought:

> Zell observed: “An entrepreneur is capable of looking at a situation and envisioning how to get from here to there. An entrepreneur sees opportunities and solutions.”[50]
>
> Gregory Dees, founder of Stanford University's Center for Social Innovation, noted: “An entrepreneurial mindset is always asking ‘how to’ make something happen.”
>
> Richard Clarke, former U.S. counter-terrorism czar, may have been describing an entrepreneurial style of thought, or something akin to it, when he asserted that the difference between “geeks” and “nerds” is that “Geeks get it done.”[51] With technology as an increasing element in innovation’s practice, there may be an increasing “geekepreneur” species of entrepreneur. However, the knowledge required goes well beyond the technical (e.g., beginning with adding customer knowledge).

Whatever the label for innovation's style of thought, it seems linked to a *developing intuitive familiarity* with the practice. Successful practitioners of the skilled craft describe early and regular experiences with the practice and its effects as what led them to pursue increasingly larger projects.

Similarly, David Kelley, a founder of the design firm IDEO and founding figure within Stanford University’s Hasso Plattner Institute of Design (d.school), describes “creative confidence” as an element of practitioner development and effectiveness.

Collaborative and Cross-Functional --

From teams to organizations practicing innovation as skilled craft, the need for shared understanding of innovation’s underpinnings is reinforced broadly. For example:

> "If one of your employees doesn’t know why they’re doing their job, then you’re really losing out."[52]
>
> "The strategy must make as much sense to all employees as it does to top management."[53]

What is not said is *how* this shared understanding is to be developed. Within a global, knowledge-based economy and an overall ingenuity epoch, innovation’s fundamentals may represent what needs to become for society overall the equivalent of an orchestra’s shared score. No matter what one’s version of participation, from creator of vision to support figure, an understanding of the score seems pertinent at every level: individual, team, organization, industry, production system, and society. For decision makers regarding deployment of resources there may be no more important understanding.

If innovation’s practice is to be converted from skilled craft to methodology, establishing a high-quality framework of innovation’s fundamentals and providing regular opportunities to practice using the fundamentals (ideally during schooling years) might be essential to developing broad understanding in the workplace.

C. Themes of Methodology as Skilled Craft -- More Detail

This section, which adds relative detail to the above overview, remains about fundamental drivers of innovation practiced as skilled craft. It remains about themes that span and unite the work of practitioners throughout the large genus of practice.

1. Purpose

Successful practitioners achieve resource leverage, but the more conscious purpose that guides their work may be about achieving a specific type of “change” by way of putting new “value” out into the world (e.g., a new approach to housing or news or matchmaking or learning or safety or voting, etc.). Typically, the domain of change reflects *practitioner* values or interests.

Within innovation practiced as a skilled craft, the pathways that practitioners take toward “what could be” hypotheses vary significantly. Examples of starting points that have been articulated:

- perceiving a suboptimal equilibrium and "embedded within it an opportunity to provide a new solution, product, service, or process" [34-1]
- personal connection to a specific purpose (e.g., humane treatment of animals)
- initial focus on opportunities to apply new technology or new knowledge
- desire to start a scalable business
- initial focus on agenda (e.g., enterprise strategy)
- initial focus on perception of a problem and wanting to address it

Domains of application tend to reflect an innovator/entrepreneur’s personally held values and interests. Drucker held that:

> "Innovators … need to be temperamentally attuned to the innovative opportunity. It must be important to them and make sense to them. Otherwise they will not be willing to put in the persistent, hard, frustrating work that successful innovation always requires."[66]

Consonant with this view, Steve Case, co-founder of AOL and chair of the Startup America Partnership, has described entrepreneurship as a model of “people, passion, and perseverance.”[64] “People” refers to a team’s shared belief in, and passion for, the particular vision of what could be. And perseverance includes all that goes into the “overnight success” that is “ten years in the making.”[65]

Similarly, intrinsic motivation is viewed as fundamental to any creative practice. "A creative product is never random or arbitrary; it must be true to something deeply sensed or felt within the person.” [65-5]

At the same time, since change requires that others adopt what is introduced, and as Say established, utility is determined fully by the adopters, “belief” in a vision must include sensibility, or discernment, about the marketplace (about users). This may be similar to Drucker’s view that “(the innovative opportunity) must make sense to them.”

For a connections-based practice, the ultimate, most powerful connection may be between a practitioner's personal values and interests (or passion) – and the external world's values and interests, as manifested by the marketplace.[62] This connection may be captured most succinctly by Robert Quinn's conceptualization of the "fundamental stance of leadership" as "inner-driven and other-focused."[61].

Successful practitioners have an "action bias"[54]; however, their sensitivity to, and sensibility about new value as a change catalyst (for resource leverage) supports effective action. For example, in a 2010 publication, the Drucker Institute quoted Drucker:

> "The characteristic of the innovator is the ability to envisage as a system what to others are unrelated, separate elements. It is the successful attempt to find and to provide the smallest missing part that will convert already existing elements."[152]

Steve Jobs and the introduction of iTunes with iPods might be seen as an example of Drucker's perspective. The iPod was not the first portable music player to employ the then-new MP3 technology; however, Jobs was the first to acknowledge the "missing element" of ease of access to digital music. It was the combination of the iPod and iTunes that enabled successful application of MP3 technology, changing the market equilibrium for portable music players.

Motivational profiles vary according to research findings and other resources about practitioners. However, again, as a creative practice, intrinsic motivation is fundamental, and personal financial gain is described as secondary to other motivators.

> "The truth is that entrepreneurs are rarely motivated by the prospect of financial gain, because the odds of making lots of money are clearly stacked against them. Instead, both the entrepreneur and the social entrepreneur are strongly motivated by the opportunity they identify, pursuing that vision relentlessly, and deriving considerable psychic reward from the process of realizing their ideas."[58]
>
> "Of three dominant motivations … power, affiliation, achievement … entrepreneurs are motivated primarily by achievement."[59]
>
> "Most successful entrepreneurs say that their primary motivation has been to build something lasting, not to make a lot of money."[60]

Drive to change the world? --

Among the themes of practitioner motivation described by thought leaders, there is a sub-theme of "quest to change the world." As one example:

> Why Serial Entrepreneurs Can't Stop --
> "Their secret? In a word: purpose."
> "Serial entrepreneurs want to make a buck, sure. … But what they really want, above all, is to change the world. (In psychiatry this attribute is known as generativity--a passion to improve the planet for successive

> generations.) Revolutionizing industries might be one approach; combating an injustice or influencing policy are two more.
> Changing the world is a quest. And that work is never done."[68]

Also, from a late 2009 cover article of the Harvard Business Review:

> "What motivates innovators to question, observe, experiment, and network more than typical executives? They want to make history … put a ding in the universe … disrupt in the cause of making the world a better place."[73]

Remarks of Bill Drayton, to whom origination of the term "social entrepreneur" is attributed and whose work generally emphasizes bringing about a *better* world (not just a *changed* world), sound similar as he speaks to the notion of "the highest caliber of entrepreneurial talent," or those who catalyze the greatest change:

> "What differentiates the entrepreneur who is going to change a pattern at the scale we're looking for from other people? I think the heart of it is that entrepreneurs, for some reason, deep in their personality know, from the time they are little, that they are in this world to change it in a fundamental way. They will not be satisfied expressing an idea. … Entrepreneurs have in their heads the vision of how society will be different when their idea is at work, and they can't stop until that idea is not only at work in one place, but is at work across the whole society. And in business, this is called marketing – going beyond the invention in the garage. The same thing is true in the social arena."[74]

What's interesting though is that Drayton's personal vision for changing the world is rooted in establishing *a society of changemakers* and doing so by first establishing a fellowship of those who represent "the highest caliber of entrepreneurial talent." Although Drayton's vision resembles Drucker's notion of "an entrepreneurial society," Drayton includes a fundamental "how" hypothesis. Drayton described his *initial* work of establishing a fellowship of "top-flight social entrepreneurs," consisting of practitioners like those he described just above, as the basis for making possible a *second-stage vision* as "everyone a changemaker" – "multiplying society's capability to adapt and change *intelligently and constructively*" [emphasis mine]:

> "What we must do now is increase the proportion of humans who know that they can cause change. And who, like smart white blood cells coursing through society, will stop with pleasure whenever they see that something is stuck or that an opportunity is ripe to be seized. Multiplying society's capacity to adapt and change intelligently and constructively and building the necessary underlying collaborative architecture, is the world's most critical opportunity now. Pattern-changing, leading social entrepreneurs are the most critical single factor in catalyzing and engineering this transformation."[74-1]

Drayton's qualification of change that is "intelligent and constructive" brings to mind the chorus of modern voices that have called for "responsible" or "forward-centered" innovation. Indeed, even as Say described that innovation's effects on society were

best addressed by others, when Say described the reasons the highest caliber of entrepreneurial talent is rare, within a context of commercial industry, the nature of talent he described does incorporate moral qualities and sounds like the highest caliber of “leadership”:

> "(T)his kind of labour requires a combination of moral qualities that are not often found together. Judgment, perseverance and a knowledge of the world as well as of business. … (T)he requisite capacity and talent limit the number of competitors for the business of (entrepreneurs)."[69]

Similarly, Drucker argued that commercial companies create disincentive for the innovation and entrepreneurship that is needed for a nation’s overall economy when senior executives’ compensation is more than 20-fold the organization’s lowest compensation.[77] Also: “An engineer will not be motivated to make a speculator rich.”[78] And from business thought leaders Hamel and Prahalad:

> "Companies that create the future are constantly striving to better the human condition."[79]
>
> "As much as anything, foresight comes from really wanting to make a difference in people’s lives."[80]

Net, even as innovation as a practice and/or type of change is amoral, most thought leaders and perhaps most practitioners, too, agree that the aim for *constructive*, responsible change is fundamental.

[As a side note: By identifying a fellowship of “leading social entrepreneurs” as the “most critical single factor” for realizing a society of *changemakers,* Drayton’s vision brings to mind Drucker’s idea about practitioner attempts “to find and to provide the smallest missing part that will convert already existing elements," quoted at the beginning of this more detailed look at “purpose.”]

2. Knowledge

Pertinent knowledge is not necessarily elite or even consciously held; it might be ordinary and/or tacitly held. Four thematic strands of knowledge are pertinent:

- *industry/domain*
- *customers*
- *general human and social dynamics*
- *“anything and everything.”*

The shipping container, viewed as one of the highest-leverage innovations of the 20th century, did not require new or advanced knowledge.[83] Nor did the McDonald’s introduction of standardized fast food.[84] Drucker depicted the innovation that *is* borne of new knowledge (both scientific and nonscientific) as the “cutting edge of the knife,” supported by a much broader base of innovation.”[85] Similarly, in the realm of “social

problem solving," thought leaders Charles Lindblom and David Cohen noted that "ordinary knowledge" plays a significant role.[86]

It may seem obvious that knowledge – or perhaps more specifically, "understanding" – is a fundamental element of innovation practiced as a skilled craft, but the basic expectation of multiple strands of knowledge is a visible and explicit theme among both thought and action leaders. Overall, there is a repeated call for "t-shaped" knowledge – deep specialized knowledge combined with broad general knowledge.

a. Domain Knowledge

Pertinent knowledge begins with the call for deep knowledge of a domain, including its technical and operational aspects:

> The "entrepreneurial move" is from intelligibility to innovation.[87]
>
> "To say something is new one must know if it has been tried before."[88]
>
> "If you deeply understand the problems … you will find solutions of value."[89]
>
> "You can't improve what you don't understand."[90]
>
> "The more familiar the parts, the more striking the new whole."[91]
>
> "The good intuiter may have been born with something special, but his effectiveness rests upon a solid knowledge of the subject, a familiarity that gives intuition something to work with."[92]
>
> "Creativity requires mastery of the medium in which the work is to be done."[93]

Say, in addition to noting "knowledge of the world," spoke also to the importance of the practical knowledge gained from hands-on experience within a domain:

> "I have said, that the cultivator, the manufacturer, the trader, make it their business to turn to profit the knowledge already acquired, and apply it to the satisfaction of human wants. I ought further to add that they have need of knowledge of another kind, which can only be gained in the practical pursuit of their respective occupations, and may be called their technical skill. The most scientific naturalist, with all his superior information, would probably succeed much worse than his tenant, in the attempt to improve his own land. A first-rate mechanist would most likely spin very indifferently without having served his apprenticeship, though admirably skilled in the construction of the cotton-machinery. In the arts there is a certain sort of perfection that results only from repeated trials, sometimes successful and sometimes the contrary. So that science alone is not sufficient to ensure their progress, without the aid of experiment …."[94]

Similarly, Drucker held that diagnoses for effective change require a depth of domain understanding associated with “experience”:

> "(Diagnosis) … requires judgment … It requires knowledge of the business, of its products, its markets, its customers, its technologies. It requires experience rather than analysis alone."[95]

b. Customer knowledge --

The fundamental premise that resource leverage relies on customers’ response to an offering, which is based on their perception of new value, has endured and also gained strength. Similar to Say’s emphasis on customer-determined utility for a market-based system of production, Drucker pointed out that the need for a customer orientation is as obvious as it is little observed:

> "Above all, we know that an entrepreneurial strategy has more chance of success the more it starts out with users, their utilities, values, realities. … ‘But this is nothing but elementary marketing,’ most readers will protest, and they are right. It is nothing but elementary marketing.”[96]

In the 21st century, thought and action leaders echo this fundamental principle:

> “A successful new business is built on customer insights.”[97]
>
> “It is enlightened self-interest to do a better job of understanding customers.[98]
>
> "The common starting point is always the consumer ... A team needs to find a way to let go of their own biases and know their target consumer inside and out."[98-1]
>
> "The customer is boss."[98-2]

Further, this principle pertains -- along with other fundamentals of innovation’s skilled craft -- to any domain of application. Augustus Owsley Stanley III, is said to have built upon an “effortless grasp of his peer group and its appetites,” which included an appetite for quality LSD, at “the time Madison Avenue was at sea about how to reach the so-called youth market of the 1960s.”[99]

Within the tech industry, Steve Jobs displayed a seemingly effortless understanding of the industry’s more generally hard-won learning that utility is determined by users: "*We're* the ones who are stupid" if consumers can't use these devices. Others who understood this early, such as Alan Cooper, called for the industry overall to catch on. In *The Inmates are Running the Asylum*, Cooper spoke directly to the industry's need for the learning, essentially echoing Jobs' statement above.

In Ann Arbor, Michigan, Menlo Innovations, which was borne of its founders’ similar pioneering attunement to the productivity of designing software to match users’ needs, trademarked the term “high-tech anthropology.”

The tech industry may have learned this fundamental aspect of innovation and entrepreneurship slowly, but it has done so surely, solidifying concepts such as “user-based design,” “human-computer-interaction,” “usability,” etc., and also generating new concepts like “customer discovery.” Tech-oriented serial entrepreneur and educator, Steve Blank, offers a model of “customer development” for new technical capability, which includes co-creating offerings with customers, combined with Geoffrey Moore’s model of new product acceptance from *Crossing the Chasm* and more.[105]

"Design thinking's" customer orientation evolved from the tech industry’s increasing link to “design,” as principles of user-based design are extended and applied broadly. In *Change by Design*, author Tim Brown, CEO of the design firm IDEO, provides a framework and methodological guidelines for design thinking. One core principle is understanding users, including the functionality of empathy for developing any new offering that intends to advance utility:

> “Empathy (is about) connecting with those observed at a fundamental level. … It is perhaps the most important distinction between academic thinking and design thinking. … The mission of design thinking is to translate observations into insights and insights into products and services that will improve lives.”[100]

At the same time, prominent designer and author Donald Norman notes that the value of “fresh eyes” can go only so far. That is, customer knowledge *alone* is insufficient. It is only one of multiple strands pertinent to innovation’s ends:

> " Today … designers work on organizational structure and social problems, on interaction, service, and experience design. Many problems involve complex social and political issues. As a result, designers have become applied behavioral scientists, but they are woefully undereducated for the task. Designers often fail to understand the complexity of the issues and the depth of knowledge already known. They claim that fresh eyes can produce novel solutions, but then they wonder why these solutions are seldom implemented, or if implemented, why they fail. Fresh eyes can indeed produce insightful results, but the eyes must also be educated and knowledgeable."[129]

Some design-based efforts, as with the tech industry, aim to relate domain knowledge more closely to user knowledge. For example, at Stanford University’s d.school, the combination of domain knowledge and customer knowledge is incorporated within design methods aiming at innovation.

Similarly, in his introduction to the 1997 Harvard Business Review volume on Innovation, John Seely Brown refers to an article that argues for the great potential that can result from enabling research technologists “to traffic in” the space of customer needs and compromises:

> "In 'Breaking Compromises, Breakaway Growth,' George Stalk, David Pecaut, and Benjamin Burnett discuss how to listen for conflict in the marketplace and how to tap into the value that is trapped in the compromises that customers have been forced to make. "The most important compromises are forced on customers simply because companies have lost touch with those customers' needs. Finding and breaking those compromises can unleash new demand and create breakaway growth."
>
> "By changing the discourse and enabling research technologists to traffic in these ideas, we are facilitating the movement of inventions into the marketplace. *And this is what we mean by "innovation": invention implemented*."[101]

The kindred concept of "customer capital" emphasizes mutual learning between firm and customer.[102] In *Intellectual Capital,* Thomas Stewart described that customer capital (one of three types of knowledge-based capital) represents a "shift of focus from selling to learning":

> "The high ground of data is mutual learning:
> If only you knew what your customers want, you could sell more to them.
> If only your customers knew what you could do, they would buy more from you. …
> Value creation is more and more a collaboration between buyer and seller."[103]

Stewart cited research indicating that customer capital was the "single most important influence on revenue per employee and profit per employee."[104]

Likeminded thought leaders such as Prahalad and Krishnan have emphasized "co-creating" offerings with customers. Again, the model in *The New Age of Innovation* takes the importance of customer utility to the extent of considering every individual customer's needs within the context of an overall model that is about innovation as a basic way of doing business.

On the other hand, criticism of "user-centered" (alone) has emerged within the context of *sustainable* development. Design thought leader Roberto Verganti has argued that "user-centered innovation is not sustainable."[106] Verganti proposed actively incorporating a priority for sustainability within the design process, including a beneath-the-surface approach to understanding customers' values and potential interests. In Verganti's view, this integration can be accomplished:

> Only forward-looking executives, designers, and, of course, policy makers may introduce sustainable innovation into the economic picture. They need to step back from current dominant needs and behaviors and envision new scenarios. They need to propose new unsolicited products and services that are both attractive, sustainable, and profitable.
>
> It is only within the framework of a vision-centered process that users can provide precious insights. There are indeed some people who are already adopting sustainable behaviors. However, they are rare exceptions. Only leaders and designers who are driven by a vision and who explicitly search a priori for those

> sustainable behaviors can tune out the unsustainable needs of 99% of users and focus on the few exceptions.
>
> One such person ... is not at all user centered in his approach … He wants to find sustainable behaviors. Therefore, he refuses to look at dominant consumption. Rather, he explicitly searches for the needle in the haystack: local fringe communities that have already found sustainable solutions for everyday living. He then engineers these solutions and proposes them at a larger scale.[108]

Verganti's challenge to *integrate* sustainability with customer value (to "propose new unsolicited products and services that are both attractive, sustainable, and profitable") seems compatible with, and/or might benefit from, others' conceptualizations, such as:

- With "customer capital's" second element: "If only your customers knew what you could do, they would buy more from you."
- With "crossing the chasm's" notions of early adopters.
- With Roger Martin's general notion of "integrative thinking." In *The Opposable Mind*, Martin described that "the practice of holding oppositions together can produce particularly powerful new combinations."[107]

c. General human and social dynamics

Fundamentally: "Innovators and entrepreneurs are in the business of change." And it is humans within societies who do the changing. The market is based on dynamics of human behavior within societal contexts. The tech industry's experience with patterns of adoption for new offerings has generated models of "change" as a knowledge resource, such as Geoffrey Moore's *Crossing the Chasm*. Though generated from new technology experience, these models might be useful to many other fields.[109]

In the *social production system*, knowledge of human and social dynamics, and "change" in particular, has special meaning. For example, many social system offerings aim at human development and behavioral change. For a variety of reasons, the social system has faced perennial difficulty in catalyzing change, and models of change specific to the social production system are receiving increasing attention.

Similarly, "insights into the human condition" is a strand of knowledge and understanding discussed by thought and action leaders across sectors. For example, Bruner, quoting Freud, wrote: "Effectiveness is not a product of utopia but rests upon insight into the human condition."[112] And academic thought leaders Lindblom and Cohen noted, with reference to social problem solving: "In the larger view, … questions about research and policy making are transformed into challenging questions about man, his brain, politics, and society."[111]

Of Zuckerberg, Time Magazine (in 2010) wrote:

> "There are other people who can write code as well as Zuckerberg … but none of them get the human psyche the way he does. …Wherever it comes from, this acute awareness of how other people's brains work characterizes all of

> Zuckerberg's projects. … Whereas earlier entrepreneurs looked at the Internet and saw a network of computers, Zuckerberg saw a network of people."[110]

Finally, to facilitate the potential of innovation practitioners to make the world a better place, "knowledge of the world" would be appropriate, to borrow Say's phrasing. The Kauffman Panel on Entrepreneurship Curriculum in Higher Education related knowledge of the world directly to insights into human and social dynamics:

> "We cannot improve a world we do not understand, and we cannot advance if we do not comprehend ourselves, our strengths, limitations, and motivations."[113]

d. Anything & everything – often seemingly "unrelated"

Guided by the drive to establish new value as the means to change, a practitioner's particular work can become an unconscious filter through which everything, including memory, is scanned. With "connection" as the basis for creative conceptions, seemingly unrelated knowledge can become integral. One prominent example is the story of Steve Jobs and MacIntosh fonts in which Jobs drew upon incidental experience learning calligraphy at Reed College:

> "I learned about serif and san serif typefaces, about varying the amount of space between different letter combinations, about what makes great typography great. It was beautiful, historical, artistically subtle in a way that science can't capture, and I found it fascinating … None of this had even a hope of any practical application in my life. But ten years later, when we were designing the first Macintosh computer, it all came back to me. And we designed it all into the Mac. It was the first computer with beautiful typography."[114]

Explaining this as a common phenomenon throughout the history of innovation, Steven Johnson notes:

> "Concepts from one domain migrate to another as a kind of structuring metaphor, thereby unlocking some secret door that had long been hidden from view."[115]
>
> "Other projects linger in margins of consciousness … Chance favors the connected mind."[116]

In this vein, many modern thought leaders have espoused the value of "T-shaped knowledge" (a term attributed originally to McKinsey & Company) or **"**T-shaped people" -- people possessing depth in a specialized area along with broad knowledge. This shape of knowledge with each practitioner is to facilitate effective connections. Also, Brown associates a T-shape with a disposition to collaboration and thus a strong resource for an *interdisciplinary* team with collective ownership, as opposed to *multidisciplinary,* with individuals focused on self interest.[117]

Similarly, a Harvard Business Review article on “The Innovator’s DNA” (followed by a book with the same name) emphasizes the innovator’s practiced “discovery skills” in association with combining elements of disparate venues -- the more diverse the knowledge the more connections. The article argues that insightful connections are generated from “discovery drive” and “discovery skills” associated with broad knowledge: questioning, observing, experimenting, and networking.[154]

3. Creativity … “Only Connect”

In contrast to wide variation in pertinent knowledge, the thinking in innovation's practice as skilled craft draws fundamentally upon higher-order processing. Critical, creative, and practical thinking are combined, including within a type of imagination that features “the ability to see possible … connections [of existing knowledge] before one is able to prove them in any way.”[38] New connections amount to *hypotheses*, such that innovation practiced as skilled craft shares with science and invention the *essential creative structure* of hypotheses.

[Update: Two sets of resources pertinent to this section are incorporated within the Provisional Framework of Fundamentals, but not in the text below. Those two sets are: (i) recent research findings from neuroscience; and (2) less visible research findings from a body of scholarly work in the late 20th century on the topic of "creativity":

- *Overall, I found the additional sets of resources to provide valuable added dimensions to the text below. They didn't change it; they enriched it.*

- *The findings of neuroscience have served mainly as a check on consistency with expert resources described below. For certain specifics, of a minor nature, I did encounter findings of neuroscience that dispute long-held assumptions about processes associated with the goal of creativity. For example, at least one neuroscience source holds that brainstorming is antithetical to generating good ideas. This type of inconsistency is pertinent to overall teaching and learning of innovation's methods. At the same time, the idea that a framework of innovation’s driving fundamentals would situate its many models and tools could mean that a tool like brainstorming would represent an option, not a requirement.*

- *The body of scholarly work on creativity, developed mainly during the last quarter of the 20th century, is said to have represented at the time the largest government funding for social science. The funding was short in duration, but the work was integral to my continuing processing of this fundamental element of innovation's organizing principles. Among the leading scientists associated with this work were: Jerome Bruner, Mihaly Csikszentmihalyi, John W Gardner, and Robert Sternberg.]*

When Jerome Bruner described (and seemingly originated the term) paradigmatic *imagination* as "the ability to make advances in understanding of [an] existing formal system" based on "the ability see possible formal connections before one is able prove them in any way," his subject was the creativity of science (advancing knowledge).[118]

Bruner associated paradigmatic *imagination* with "paradigmatic thought," as one of two broad modes of thought: paradigmatic and narrative. Bruner described the paradigmatic mode, otherwise known as logico-deducto, with "attempts to fulfill the ideal of a formal, mathematical system and description and explanation." The alternate "narrative" mode of thought, associated with narrative imagination, leads to "good stories" and "gripping drama."[122]

Although innovation's practice does not involve new insights into an existing formal system, Bruner described the paradigmatic mode of thought and imagination with respect to a broad range of human activity, which would encompass insights about ways to introduce change to production systems (including customers), as discussed shortly. Additionally, the notion of seeing possible new connections of knowledge before one can prove them ("hypotheses") fits well with the general stream of work with respect to innovation's expression of imagination:

- As Steven Johnson has noted, "Good ideas are not conjured out of thin air; they are built out of a collection of existing parts (conceptual and/or mechanical).[133]
- Also, tech entrepreneur and educator Steve Blank has emphasized the essential action plan of a business model, using the example of inserting "hypotheses" within the "Business Model Canvas" (and then testing the hypotheses). Blank drew upon this approach in his partnership work with the National Science Foundation in educating research scientists at major universities in the work of applying advances in science or technology. Blank shared with an audience of non-scientists that his initial use of the term "hypotheses" was to give scientists a familiar on-ramp, and he found it useful more broadly.[120-5]

This section, which is longer than its two complements just above, delves deeper into the fundamental cognitive/creative processing associated with innovation practiced as a skilled craft. It includes the following subheadings:

- *Only Connect*
- *Discernment*
- *Internal & External Conditions*
- *Medium of Expression*

a. Only Connect … New connections are built from existing parts --

Within either of the two modes of thought that Bruner referenced -- paradigmatic or narrative -- he established the working definition of “creating” as “effective surprise,” which results from new combinations of existing knowledge, or “combinatorial activity”:

> "An act that produces ‘effective surprise’ – this I shall take as the hallmark of a creative enterprise.”[123]
>
> "The content of the surprise can be as various as the enterprises in which men are engaged. It may express itself in one’s dealing with children, in making love, in carrying on a business, in formulating physical theory, in painting a picture."[124]

Though surprise is unexpected, “effective” surprises tend to have a quality of obviousness about them:

> "Surprise is … the unexpected that strikes one with wonder or astonishment. What is curious about effective surprise is that it need not be rare or infrequent or bizarre and is often none of these things."
>
> "Effective surprises … seem … to have the quality of obviousness about them when they occur, producing a shock of recognition following which there is no longer astonishment."[125]

The quality of obviousness fits with what is often viewed as the ultimate compliment to a new idea: “This is obvious … Why didn’t we think of this sooner?” A compelling new idea may seem more practical than creative. Yet, Bruner also notes: “The triumph of effective surprise is that it takes one beyond common ways of experiencing the world.”[126]

Bruner drew too on another’s description: “making combinations that ‘reveal to us unsuspected kinship between … facts long known, but wrongly believed to be strangers to one another.”[121]

b. "Invention is discernment" --

Further, “effective” is a crucial modifier of “surprise.” Bruner notes that only a “small minority” of new combinations are effective. He also held that discernment is integral to the cognitive activity, positing that "invention is discernment":

> "To create consists precisely in not making useless combinations and in making those which are useful and which are only a small minority. Invention is discernment, choice."[127]

Bruner hypothesized that discernment is associated in part with one's development in a field of knowledge, resulting in an "intuitive familiarity":

> "I suspect that in each empirical field there is developed … a kind of 'intuitive familiarity' … that gives him a sense of what combinations are likely to have predictive effectiveness and which are absurd."[128]

The notion of intuitive familiarity fits with the emphasis on domain knowledge among thought and action leaders: "Innovate only where you understand" and with designer and author Donald Norman's observation that the value of "fresh eyes" can go only so far.

John W. Gardner noted that creativity adds to, or extends, the benefits of domain and/or technical knowledge:

> "Creativity requires mastery of the medium in which the work is to be done, but it requires something more."[130]

Gardner held too that this extension is associated with "a trait misunderstood":

> "The truly creative person is not an outlaw, but a lawmaker. They bring about new relatedness, connect things that did not seem previously connected, sketch a more embracing framework, move toward larger and more inclusive understandings."[131]

c. "Combinatorial" Processing

Bruner's premise "that all of the forms of effective surprise grow out of combinatorial activity – a placing of things in new perspectives"[132] is widely held in the present day and in direct association with innovation and entrepreneurship. In 2010 Steven Johnson wrote of the history of innovation: "Good ideas are not conjured out of thin air; they are built out of a collection of existing parts (conceptual and/or mechanical)."[133]

Bruner described that paradigmatic imagination extends the benefit of critical thinking by integrating it with creative thinking skills and practices. Symbolically, as Bruner put it: "(T)he left hand (is) trying to transmit to the right."[119]

> "(T)he fact and symbolism of the right hand and the left – the one the doer, the other the dreamer. The right is order and lawfulness … Its beauties are those of geometry and taut implications. Reaching for knowledge with the right hand is science. Yet to say only that much of science is to overlook one of its excitements, for the great hypotheses of science are gifts carried in the left hand."[120]

Viewed in terms of Bloom's Taxonomy of thinking skills, paradigmatic imagination may integrate the top three skills: evaluation, analysis, and synthesis:

In IDEO president Tim Brown's account of the creative process, analysis and synthesis are "equally important":

> "The creative process … relies on synthesis, the collective act of putting pieces together to create whole new ideas. Once the data have been gathered, it is necessary to sift through it all and identify meaningful patterns. Analysis and synthesis are equally important, and each plays an essential role in the process of creating options and making choices."[134]

Sir Ken Robinson may have taken this notion a step further as he described combining "the evaluative and the generative": The evaluative process represents the thinking skills, and the generative *medium* translates the evaluative into something new (e.g., for science, the generative medium is "argument"). For innovation, developing and implementing new offerings would constitute the main medium of expression.[134-1]

Additionally, beyond thinking skills, an HBR volume on Knowledge Management addresses the broader domain that Bruner described as the “right hand’s ways of knowing.” For example, this volume described the function of giving internal access to images and symbols, such as metaphors, within productive combinatorial processing:

> "(C)reating new knowledge is not simply a matter of 'processing' objective information. Rather, it depends on tapping the tacit and often highly subjective insights, intuitions, and hunches of individual employees and making those insights available for testing and use by the company as a whole. … (E)mbodying tacit knowledge in actual technologies and products requires managers who are as comfortable with images and symbols … as they are with hard numbers."[135]

Another example of alternate ways of knowing may include the realm of “mindfulness” that Jon Kabat-Zinn describes as a largely untapped source of creativity in the West.

In general, Bruner described the “how” of arriving at effective new combinations as a matter of connecting the technical with “inspiration.” There can be more to the practice of creativity than thinking and knowing skills, but structures of thinking and knowing seem fundamental.

d. Internal conditions and external conditions

The work of various creativity thought leaders, Bruner included, associates the creative process with both internal and external conditions (or ecosystems) and with reciprocity between internal and external conditions. Johnson detected ecosystems as a powerful correlate with innovation, or “great ideas,” over a period of centuries, but he also cautioned sensitivity to the pitfall of “group think.” Johnson notes that innovation is not “the wisdom of the crowd but the wisdom of someone in the crowd.”[136] And Gardner argued: “All innovation begins with the individual.”

Thematic descriptors of fruitful conditions are consistent for both internal and external: openness; flexibility, and complexity.

i. Openness

Johnson describes ecosystems as the means to innovation's requirement of getting more "parts on the table" to enable new connections. As a general premise, Johnson notes that openness is fertile: "If there is a single maxim that runs through this book's arguments, it is that we are often better served by connecting ideas than we are by protecting them." Johnson identified seven patterns that he found to correlate with individuals' generation of innovation throughout several hundred years, with most featuring the reciprocity of internal and external conditions:

> "The argument of this book is that a series of shared properties and patterns recur again and again in unusually fertile environments. The more we embrace these patterns the better we will be at tapping our extraordinary [individual] capacity for innovative thinking."[137]

Seely Brown points out the nontrivial incongruity between the premise that "knowledge and intellect grow exponentially when shared" and the observation that organizational and cultural systems are not structured to reward the sharing. In addition to novel practices such as the "spider web" organization that brings people together quickly for a charge and then disbands them, innovation productivity will require "cultural norms with reward systems tailored to the purpose."[138]

Bruner too spoke of external openness. Of a year-long participant observation of a "highly productive invention group," Bruner's most general conclusion was:

> "The effectiveness of group members consisted in their sense of freedom to explore possibilities, in their devotion to elegant solutions, and in the interplay among them that, in effect, made each man stronger in the group than individually."[139]

Both Bruner and Gardner spoke of internal "openness" as well, as a condition of creativity found "in most highly original people." Gardner's description included:

> "More significant than their receptivity to the external world is their exceptional openness to their own inner life. They do not suppress or refuse to face their own emotions, anxieties and fantasies. They are better able to 'relinquish conscious control and to face … the impulses and imagery arising from more primitive and unconscious layers of the personality.' … They have fewer internal barriers or watertight compartments of experience.[140]

In this vein, Johnson described the historically productive pattern of the "slow hunch." And Gardner noted: "Creative engineers let their hunches … come to the surface, where the uncreative ones would tend to censor them."[141]

ii. Flexibility

On the internal trait of flexibility, there are similar reinforcements. Gardner explained this trait's function within those who are highly original:

> "(T)hey do not persist stubbornly in one approach to a problem. They can change directions and shift strategies. They can give up their initial perception of a problem and redefine it. … Related to this flexibility is a trait psychologists have called a "tolerance for ambiguity." … They do not find it difficult to give expression to opposite sides of their nature at the same time. … The advantage of this fluidity is that it permits all kinds of combinations and recombinations of experience with a minimum of rigidity."[142]

Again, Roger Martin echoed ideas about cognitive flexibility within his account of "integrative thinking" within, *The Opposable Mind*, where he described that "the practice of holding oppositions together can produce particularly powerful new combinations."[143]

Further, in a report of research conducted to determine "how expert entrepreneurs think," the overarching finding was that experts rely on "effectual reasoning," which exemplifies flexibility as a way of life:

> "Brilliant improvisers … they constantly assess how to use their personal strengths and whatever resources they have at hand to develop goals on the fly, while creatively reacting to contingencies … As much as the ability to concoct new products, it is (a) tendency to riff off whatever ideas or materials are handy that defines entrepreneurs as a creative breed."[144]

Flexibility was central to Seely Brown's introduction to the Harvard Business Review volume that encompassed a wide variety of approaches to individuals working together in a creative process. Seely Brown stressed the need for flexibility to engage a repertoire of approaches:

> "To do things differently, we must learn to see things differently. Seeing differently means learning to question the conceptual lenses through which we view and frame the world ... To see differently, we need new intellectual constructs."[145]

iii. Complexity

Multiple sources speak to the value of "complexity" in generating productive new combinations. Brown argued that "complexity is the most reliable source of creative opportunities.[146] And in the words of Oliver Wendell Holmes:

> "I would not give a fig for the simplicity on this side of complexity, but I would give my life for the simplicity on the other side of complexity."

At the same time, Gardner notes an important inner condition for making either external or internal complexity productive: Highly original people can "tolerate a wild profusion of ideas and experience" because of their capacity to "find order in experience."[147] And this tolerance is associated with "profound confidence in" one's capacity to bring some new kind of order. (This seems similar to David Kelley's description of "creative confidence" as a crucial developmental trajectory.)

Thus, making complexity productive requires a tolerance that is borne of confidence in one's capacity for effective paradigmatic imagination. In other words: Developing skill leads to a confidence that leads to a tolerance for complexity that leads to discernment of effective connections in the midst of the complexity.

Such confidence, it would seem, would result from development borne of fruitful practice with paradigmatic imagination. The practice could begin from genetic predisposition, environmental conditions, or both, but something must get it started, and it is productive outcomes that are likely to keep it going, developing into increasingly capable discernment and associated confidence.

iv. Absorption

Among other inner conditions of creativity, both Gardner and Bruner included in their lists sustained commitment and energy: "(Highly original people) are wholly absorbed in their work."[148] They experience unusually strong intrinsic motivation.

For imagination applied to innovation and entrepreneurship, the inner condition of absorption is widely noted, with a strong element of intellectual engagement. Drayton holds that entrepreneurs "think about how to's in the shower." Schumpeter spoke of entrepreneurs' "joy of creating." And again, Prahalad counseled Acumen fellows not to

engage in the work for moral reasons only, but because “intellectually it’s the most exciting thing you can aspire to as a young person.”[149]

These thought leaders also indicate that an individual's absorption and intrinsic motivation can be both shared and united. A clear and compelling hypothesis-based vision can promote shared absorption within an operating environment, from small team to large organization. Further, the more that everyone in the environment shares an overall innovator/entrepreneur style of thought, the more likely may be the prospect for reciprocity, synergy, and a flexibility that is combined with focus. Seely Brown referred to “collectives of shared purpose.” Optimally, a team can improvise in the mode of a jazz combo.

v. Not responsive to conscious efforts to control it

There is a theme too of original thinkers being able to facilitate, but not will, creativity. For example, Gardner noted:

> "The creative process is often not responsive to conscious efforts to initiate or control it. It is unpredictable, digressive, capricious. The role of the unconscious mind in creative work is substantial."[150]

Drucker held that “innovative opportunities do not come with the tempest but with the rustling of the breeze.” At the same time, Drucker declared: “Successful entrepreneurs do not wait until the muse kisses them. They go to work.”[151] In other words, among successful practitioners of the skilled craft, the technical work continues as does the guiding purpose of establishing compelling new value, toward resource leverage.

e. Interaction with Medium of Expression

Again, drawing on Sir Ken Robinson's notion of combining "the evaluative and the generative," where the generative aspect reflects a *medium of expression*, it would seem that the medium for innovation and entrepreneurship would be developing and implementing *offerings* (of new value) – putting them out into the world.

Just as the function of resource leverage and the medium of offerings for customers/users affects which “parts on the table” are pertinent to connections regarding new value to customers, it’s worth considering if innovation’s function *and medium* may also affect the innovator's version of creative (cognitive) processing.

Thematically, there seems to be mainly similarity for the innovation practitioner's element of creative processing. For example, whether applied to science, invention, or innovation, Steven Johnson uses the term “exaptation” to describe the detection of a fruitful new connection for one domain based on borrowing an example from another domain. (*The Ten Faces of Innovation* uses the label of "cross pollinating” in applying the exaptation concept to innovation's function.)

Other creative practices, such as "observation" and "diagnosis," are similarly applicable across methodologies, but can be considered specifically for innovation's particular medium for combining the evaluative and generative. For example:

> Observation could include looking across domains, as with exaption, or association. However, the successful innovation practitioner's observation is described also as sensitive to what Roger Martin and Sally Osberg termed "suboptimal equilibrium."

One could imagine that Steve Jobs may have observed a suboptimal equilibrium with the initial portable music players that utilized MP3 technology. In introducing the iPod (an application of MP3 technology), Jobs addressed the suboptimal equilibrium by introducing iTunes at the same time, providing a ready way to load music onto iPods.

Within innovation's practice, perceptive observation includes skill at "seeing" (evaluating) when an operation is or isn't suboptimal, broken, ripe for improvement, possessing a gap or incongruity or missing link in functioning, when there is positive deviance that could be developed, and so on.

Drucker linked observation to diagnosis, depicting innovation's combinatorial processing as "diagnostic" and "perceptual fully as much as conceptual."[153] Drucker also associated innovation's diagnostic processing, or leaps, at least partially, with a sensitivity to systems. Again, in a 2010 publication, the Drucker Institute quoted Drucker:

> "The characteristic of the innovator is the ability to envisage as a system what to others are unrelated, separate elements. It is the successful attempt to find and to provide the smallest missing part that will convert already existing elements."[152]

"Finding" plus "providing" reflects the combined evaluative and generative for innovation and entrepreneurship. Like medicine, innovation's leaps may combine diagnosis and treatment, or they may occur separately. An hypothesized new value proposition in the form of an offering may or may not embody both diagnosis and treatment. And innovation's versions of creative processing may feature this linkage, at times seemingly fused and at other times beginning with "partially formed" ideas, which may be processed "in the shower" and beyond.

D. Summation - Pulling the Parts Together

Following this report of sources, I discovered a model for understanding creativity developed by Mihaly Csikszentmihalyi, which provided perspective that helped pull all of the above together. (The model was included within the body of related scholarly work funded by the U.S. federal government during the last ~third of the 20th century.)

Called "Domain Individual Field Interaction" (DIFI), this model focused on the creativity of science. I first encountered it as Csikszentmihalyi outlined it in: R. J. Sternberg (ed.), *The Nature of Creativity*, (Cambridge University Press: New York, 1988). It also is discussed in association with other creativity scholarship in: David Henry Feldman, Mihaly Csikszentmihalyi, and Howard Gardner, *Changing the World, A Framework for the Study of Creativity*, (Praeger Publishers: Westport, CT, 1994).

DIFI's prompt led me to outline the table below, which compares and contrasts the creativity of innovation with that of science and invention. The table's content for innovation represents an attempt to distill all of the material reviewed in this report of "sources," plus additional knowledge from sources detailed in the Bibliography documents, plus content for the Invention column (highly provisional) based on distinctions associated with ordinary knowledge and implied by the range of sources.

Separately, one particular source (Stephen Goldsmith's *The Power of Social Innovation*) led me to consider that a "social innovation differential' might be needed to highlight distinctions Goldsmith pointed to for the purpose of "change by way of value" within the social production system. I include those distinctions in this closing section as well, following the table.

1. Comparing and Contrasting Creativity within Innovation, Science, & Invention

The table below might be interpreted generally as follows:

Innovation's version of creativity shares with the creativity of science and invention the essential structure of hypotheses:

- For each of these three methodologies, the effect of change from a status quo is rooted in new connections of existing knowledge -- or hypotheses.
- That is, hypotheses represent each methodology's essential creative structure.
- The imagination that produces these new connections of existing knowledge represents "the ability to see possible new connections before one is able to prove them in any way" (what Bruner called "paradigmatic imagination").

The point of departure among the three methodologies is the type of change that each methodology produces, which determines the nature of its hypotheses and leads to additional fundamental distinctions, summarized in the table just below:

	Innovation	Science	Invention
WHAT is it?	The change of new/greater value put out into the world & adopted by customers. Change by way of "value."	The change of new/greater knowledge.	The change of new/greater technical capability.
WHY does it matter?	Resource Leverage Improve: -Standard of living (GDP) -Human well-being -Sustainable planet	Understand the world Can be applied (e.g., as innovation).	Drive human progress. Can be applied (e.g., as innovation).
WHERE does it happen?	Mainly commercial & social production systems. All human activity but that which could be considered existential.	Mainly disciplinary fields of knowledge	Mainly disciplinary/technical fields of knowledge. Includes "appropriate technology."
HOW does it happen?	Integrate & Apply Knowledge	Scientific method.	Widely varying (including Engineering).
Rooted in Hypotheses	Combination of: "What could be as new value to customers." "How the new value could become an offering accessible to, and adopted by, customers."	"What is"	"What could be technically"
Medium of Expression	Offering	Argument	Technical Function
Knowledge Pertinent to Hypotheses	Typically integrates knowledge from core strands, such as: (i) industry/operations (ii) customers (iii) human, social & technological dynamics. *Can feature "ordinary" knowledge.* *Can incorporate advances in Science and/or Invention.*	Primarily disciplinary	Primarily disciplinary/technical
WHO generates & acts on the hypotheses?	Those who possess *pertinent* knowledge, purpose, skills. Typically involves a cross-functional team.	Typically masters of a field of knowledge	Typically master(s) of a technical field. Can include inventors, engineers.
WHO are gatekeepers of change?	Customers	Experts in field (peer review)	Varies (includes innovators who incorporate new technical capability within offering).
WHAT are gatekeeper criteria?	Forcefully positive new value compels sustained adoption	Argument is valid & reliable	Demonstration is reliable

2. Social Innovation Differential

The concept of a "social innovation differential" acknowledges that offerings addressed at social change (here considered as offerings aimed primarily at catalyzing greater yield in terms of "planet" and/or "people") often include two fundamental distinctions from other innovation examples:

- Resource leverage *often* requires that an offering catalyze sustained change in customer *behavior* and/or *capability*, beyond adoption.
- The end-customer is not always the purchasing customer.

Discussion of these distinctions is intended as a drilling down within the table above:

a. Resource leverage *often* requires that an offering catalyze sustained change in customer *behavior* and/or *capability*, beyond adoption.

This first distinction represents an amplification of the point that *needed customer response to value can vary* (e.g., need for change in behavior in addition to adoption).

Although this aspect of customer response is not unique to offerings aimed *focally* at "planet" or "people" (within the social production system), it's typical of such offerings. As Drucker put it, social innovation involves “changing people.”

Indeed, in some cases of social innovation, the existing resources that offerings aim to change are the human-resource *customers*. Again, while not unique to the social domain, this aim is fundamentally different from offerings that require only adoption. For example:

- Curbside recycling pick-up can offer the value of ease, but advancing the yield of natural resources via recycling calls for customers to change their behavior (facilitated by the new value of ease).
- An educational offering like the online Khan Academy may catalyze use among student customers (behavior); however, the use must be effective if the offering is to realize the Khan Academy's aim of advancing learning/capability.

b. The end-customer is not always the purchasing customer.

This second distinction of the social differential comes mainly from Stephen Goldsmith's *The Power of Social Innovation*. As Goldsmith has explained, the social system’s end “user,” or customer, often does not have the market-based customer’s power of choice.[159] Instead, those making purchase decisions might be practitioners within public-service institutions (e.g, a school board, hospital administration), etc.

To compensate for this often-missing dynamic of the market, an offering's "how" hypotheses may call for attention (and creativity) that go beyond considerations associated with commercial channels of distribution. Again, this attention is not necessarily unique to the social production system, but it may be more standardly needed:

- "How" hypotheses associated with offerings intended to benefit end users may need to catalyze change for multiple customer levels or segments, often within complex systems of social service delivery:

  For example, initial offerings of food recovery -- intended to advance yield on resources toward the societal goal of reduced hunger -- needed to consider fitting catalysts for change among:

  - food recipient “end” customers, plus
  - customers who have recoverable food to provide (e.g., grocers and restaurants),
  - distribution channel customers (e.g., social service agencies),
  - funding source customers, and
  - volunteer labor customers.

  As another example, an offering of instructional improvement intended to advance yield on (human) resources toward a societal goal of student learning (and/or economic goals associated with student learning) may need to consider fitting change catalysts among:

  - student “end” customers, plus
  - teacher and school-leader customers, and
  - additional decision-making customer groups (e.g., school system, parents, and/or taxpayers).
  - the overall political system

- How hypotheses may involve novel means to acquire end users' influence.

  For example, one means is to involve end users in the co-creation of offerings, even though they’re not the purchasers.

  Another example involves end users in offering *evaluation*: "(B)uilding a system so low-income families can rate social service programs the way customers rate restaurants on sites like Yelp" ... "If foundations and government agencies began using customer rankings as a criteria when allocating funding to social service programs — that is, if working poor families got to shape the services they needed to get ahead — it would represent a major, and radical, step forward." [160]

NOTES

[1] The model, known as “DIFI” ("Domain Individual Field Interaction"), developed by Mihaly Csikszentmihalyi, focuses on the creativity of science. It is outlined in a chapter of R. J. Sternberg (ed.), *The Nature of Creativity*, (Cambridge University Press: New York, 1988) and also discussed in David Henry Feldman, Mihaly Csikszentmihalyi, and Howard Gardner, *Changing the World, A Framework for the Study of Creativity*, (Praeger Publishers: Westport, CT, 1994).

[1.5] Joseph A. Schumpeter, *Capitalism, Socialism, and Democracy*, (Harper & Brothers, New York and London, 1942), p 132

[2] Jean Baptiste Say, *A Treatise on Political Economy*, (1821), p 18

[3] Say, p 285

[4] Say, p 27

[5] Schumpeter, p 81

[6] Schumpeter, p 132

[7] Say, Book I, Chapter I

[8] Say, Book I, Chapter I

[9-1] Peter F. Drucker, *Innovation and Entrepreneurship*, (HarperBusiness, 1985), p 21

[9-2] Drucker, 1985, p 28

[9-3] Drucker, 1985, p 31

[9-4] Drucker, 1985, p 252

[9.5] Drucker, 1985, p 21

[9-6] Drucker, 1985, 21

[9-7] Drucker, 1985, 21

[9-8] Drucker, 1985, 21

[9-9] Drucker, 1985, 21

[10] Drucker, 1985, p 30

[11-1] Drucker, 1985, p 22

[11-2] Drucker, 1985, p 31

[11-3] Drucker, 1985, p 33

[12] Drucker, 1985, p 35

[13] Drucker, 1985, p 14

[14] Drucker, 1985, p 19

[15] Drucker, 1985, p 21

[16] Prahalad, video, Keynote Address at AcumenFund 2009 Fellows Graduation, acumenfund.org

[17] Gary Hamel and C. K. Prahalad, *Competing for the Future*, (Harvard Business School Press, 1997), p 160

[18] C. K. Prahalad and M. S. Krishnan, *The New Age of Innovation*, (McGraw-Hill: New York, 2008), p 11

[19] Prahalad & Krishnan, p 40

[20] Drucker, 1985, pp 148-149; Hamel & Prahalad, 1997

[21] C. K. Prahalad, *The Fortune at the Bottom of the Pyramid*, (Wharton School Publishing, Upper Saddle River, NJ, 2005)

[22-1] Drucker, 1985, p 27

[22-2] Drucker, 1985, p 27

[23] Drucker, 1985, p 138

[24] Drucker, 1985, p 17

[25] Drucker, 1985, p 254

[26] Peter F. Drucker, *Post-Capitalist Society*, (Harper Business, 1993), pp 59-60

[27] Drucker, 1993, p 45

[28] Drucker, 1993, p 58

[29] Drucker, 2002, p 109

[30] Michael E. Porter and Mark R. Kramer, “The Big Idea: Creating Shared Value,” Harvard Business Review, January-February, 2011

Dominic Barton, “Capitalism for the long term,” Harvard Business Review, March 2011

[30-5] Mihaly Csikszentmihalyi, The Evolving Self: A Psychology for the Third Millenium, (HarperCollins: New York, 1993), p 62

[31]Entrepreneur for Society, Bill Drayton and Ashoka, 2006, DVD

[32] Roger L. Martin & Sally Osberg, “Social Entrepreneurship: The Case for Definition,” Stanford Social Innovation Review, Spring 2007

[33] Leslie R Crutchfield and Heather McLeod Grant, *Forces for Good: The Six Practices of High-Impact Nonprofits*, (San Francisco: Jossey-Bass, 2008), pp 19-20.

[34] “Developing the Field of Social Entrepreneurship,” A Report from the Center for Advancement of Social Entrepreneurship, June 2008

[34-1] Roger L. Martin & Sally Osberg, "Social Entrepreneurship: The Case for Definition," Stanford Social Innovation Review, Spring 2007

[35] University of Michigan Erb Institute video archives, “Is Consumerism Sustainable?”, 2007

[36] Jeffrey Sachs, Stanford Social Innovation Review, Summer 2010

[37] John W. Gardner, *Self-Renewal: The Individual and the Innovative Society*, (Norton, New York, 1963), p 6

[38] Bruner, *Actual Minds, Possible Worlds*, (Harvard University Press, 1986), p 13

[39]Jerome S. Bruner, *On Knowing, Essays for the Left Hand*, (Belknap Press of Harvard University Press: Cambridge, 1962), p 22

[40] Bruner, 1962, p 22

[41] Bruner, 1962, p 18

[42] Time Magazine, January 2011, “2010 Person of the Year”

[43] Samuel Zell, video, 2003, Zell-Lurie Institute, University of Michigan

[44] David Bornstein, *How to Change the World, Social Entrepreneurs and the Power of New Ideas*, (Oxford University Press, New York, NY, 2004), p 122

[45] Clayton M. Christensen and Michael E. Raynor, *The Innovator’s Solution*, (Harvard University Press: Boston, 2003), p 214

[46]Margalit Fox, “Owsley Stanley, Artisan of Acid, Is Dead at 76,” New York Times, Obituary, March 14, 2011

[47]Walker, New York Times, March 18, 2011

[48] Jerome S. Bruner, *The Process of Education*, (Harvard University Press, 1960), p 28

[49] Bruner, 1960, p 28

[50] Zell, video, Zell-Lurie Institute

[51] Richard Clarke, Comedycentral.com, Colbert Report, video, January 17, 2007

[52] Quote within article by Leigh Buchanan, “How Great Entrepreneurs Think,” Inc Magazine, February 1, 2011

[53] Christensen and Raynor, p 214

[54] “Reflecting on Prahalad Reflecting on Drucker,” by Rick Wartzman, BusinessWeek.com, 4/23/10

[55] Steven Berglas, Berglas.com, video

[56] “Developing the Field of Social Entrepreneurship,” A Report from the Center for Advancement of Social Entrepreneurship, June 2008

[57] Stephen Goldsmith, *The Power of Social Innovation*, (Jossey-Bass: San Francisco, 2010), p 112

[57-1] Alexander Osterwalder & Yves Pigneur, *Business Model Generation*, (John Wiley & Sons: 2010), p 246

[58] Martin & Osberg, p 34

[59] Bornstein, p 52

[60] “Money Is Not The Best Motivator,” Jon R. Katzenbach and Zia Khan, Forbes.com, 4-6-10

[61] Robert E. Quinn, *Change the World: How Ordinary People Can Accomplish Extraordinary Things*, (Jossey-Bass: San Francisco, 2000). Also: "Determination and Openness," www.ThePositiveOrganization.wordpress.com, Feb. 22, 2016

[62] This does not mean that the sets of values need to be the same or need to be constructive. An entrepreneur could identify an opportunity for personal gain that taps a different set of values in the external world.

[63] Video, Prahalad to 2009 Acumen Fund Fellows (acumenfund.org)

[64] Steve Case, video, Feb. 24, 2010, Stanford University, ecorner.stanford.edu

[65] Case, video

[66] Drucker, 1985, p 138

[67] S. Shane et al., “Entrepreneurial Motivation,” Human Resource Management Review 13 (2003) 257–279 269

[68] Steven Berglas, Forbes.com, August 3, 2010

[68-1] Carl Schramm, "All Entrepreneurship is Social," Stanford Social Innovation Review, March 10, 2010

[69] Say, p 286

[70] Schumpeter, 1942

[71] Bo Burlingham, *Small Giants: Companies that Choose to Be Great Instead of Big*, (New York: Portfolio, 2005).

[72] Krista Tippett, onbeing.org, Blog, Dec. 2010

[73] Harvard Business Review, Dec. 2009, “The Innovator’s DNA”

[74] Bornstein, p 122

[75] Time Magazine, January 2011

[76]Time Magazine, January 2011

[77] Drucker, 2002, p 79

[78] Drucker, 1993, p 80

[79] Hamel & Prahalad, p 103

[80] Hamel & Prahalad, p 105

[81] Chrystia Freeland, “The Rise of the New Ruling Class, The Atlantic, January-February 2011

[82]Freeland, 2011

[83] Marc Levinson, *The Box: How the Shipping Container Made the World Smaller and the World Economy Bigger,* (Princeton University Press, 2006)

[84] Drucker, 1985, p 49

[85] Drucker, 1985, p 125

[86] Charles E. Lindblom and David K. Cohen, *Usable Knowledge, Social Science and Problem Solving*, (Yale University Press: New Haven and London, 1979), p 12

[87] “Entrepreneurship in American Higher Education,” A Report from the Kauffman Panel on Entrepreneurship Curriculum in Higher Education, Kauffman Foundation, p 12

[88] Bill Drayton, “Entrepreneur for Society: Bill Drayton and Ashoka,” DVD, 2006

[89] Prahalad, video, Keynote to Acumen Fund Fellows

[90] Drucker, 1985, p 175

[91] Carol Eikleberry, *The Career Guide for Creative and Unconventional People*, (Ten Speed Press, Berkeley, California, 2007), p 66

[92] Bruner, 1960, p 56

[93] Gardner, p 34

[94] Say, p 55

[95] Drucker, p 153

[96] Drucker, 1985, p 252, p 251

[97] Ravi Mohan, keynote speaker at Zell-Lurie Institute's 2009 "Entrepalooza"

[98] Tim Brown, *Change by Design*, (Harper Business: New York, New York, 2009), p 177

[98-1] A. G. Lafley and Ram Charan, *The Game-Changer*, (Crown Business: New York, 2008), p 228

[98-2] Lafley and Charan

[99]Michael Walker, "Electric Kool-Aid Marketing Trip," New York Times, Op-ed Contributor, March 18, 2011

[100] Brown, p 49

[101] Seeing differently: insights on innovation / edited with an introduction by John Seely Brown. Boston, MA: Harvard Business School Press, c1997

[102] Thomas A. Stewart, *Intellectual Capita*l, (Currency Doubleday: New York, New York, 1997),

p 192, 195

[103] Stewart, p 192

[104] Stewart, p 193

[105]Steven G. Blank, *The Four Steps to the Epiphany*, (Printed by cafepress.com, 2006).

[106]Roberto Verganti, "User-Centered Innovation is Not Sustainable," The Conversation, Harvard Business Review, blogs.hbr.com, March 19, 2010

[107] Roger Martin, *The Opposable Mind*, (Harvard Business School Press, Boston, MA, 2007)

[108]Verganti. The Conversation, Harvard Business Review, 2010

[109] Geoffrey A. Moore, *Crossing the Chasm: Marketing And Selling High-Tech Products To Mainstream Customers* (New York, Harper Business Essentials, 2002)

[110]Time Magazine, January 2011

[111] Lindblom and Cohen, p 3

[112] Bruner, 1962, p 163

[113] "Entrepreneurship in American Higher Education," p 4

[114] Steve Jobs, Commencement Address, Stanford University, 2005, Youtube.com

[115] Steven Johnson, *Where Good Ideas Come From: The Natural History of Innovation*, (New York Riverhead Books, 2010), p 159

[116] Johnson, p 173

[117] Brown, p 27

[118] Bruner, 1986, p 13

[119] Bruner, 1962, p 5

[120] Bruner, 1962, p 2

[120-5] Steve Blank, within keynote address, “Startup Lessons Learned” conference (predecessor of “Lean Startup” conference), 2011, San Francisco, CA

[121] Bruner, 1962, p 19

[122] Bruner, 1962, p 13

[123] Bruner, 1962, p 18

[124] Bruner, 1962, p 18

[125] Bruner, 1962, p 18

[126] Bruner, 1962, p 22

[127] Bruner, 1962, p 20

[128] Bruner, 1962, p 21

[129] Donald A. Norman, JND.org

[130] Gardner, p 34

[131] Gardner, p 33

[132] Bruner, 1962, p 18

[133] Johnson, p 33

[134] Brown, p 67

[135] Harvard Business Review on Knowledge Management, 1987, “The Knowledge Creating Company.”

[136] Johnson, p 58

[137] Johnson, p 21

[138] "Seeing differently: insights on innovation" / edited with an introduction by John Seely Brown. Boston, MA: Harvard Business School Press, c1997

[139] Bruner, 1962, p 11

[140] Gardner, p 36

[141] Gardner, p 36

[142] Gardner, p 38

[143] Martin, 2007

[144] Leigh Buchanan, “Inside the Minds of Great Entrepreneurs,” Inc., February 2011, pp 56-61

[145] “Seeing Differently: Insights on Innovation” / edited with an introduction by John Seely Brown. Boston, MA: Harvard Business School Press, c1997

[146] Brown, p 86

[147] Gardner, p 38

[148] Gardner, p 39

[149] video, Prahalad to 2009 Acumen Fund Fellows (acumenfund.org)

[150] Gardner, p 34

[151] Drucker, 1985, p 34

[152] thedx.org, December 29, 2010, Drucker Exchange 1.0. Produced by the Drucker Institute, Claremont Graduate University

[153] Drucker, 1985, p 50

[153-1] Nicholas Lore, *The Pathfinder*, (Simon & Schuster: New York, 1998), p 253

[154] Harvard Business Review, "The Innovator’s DNA," December 2009

[155] Bornstein, p 53

[156] Brown, p 43

[157] Prahalad and Krishnan, p 81

[158] Stewart, p 132

[159] Goldsmith, 2010

[160] Goldsmith, 2010

THE FOLLOWING FOOTNOTES NEED TO BE RENUMBERED:

[28] See, for example: Clayton M. Christensen, *The Innovator's Dilemma*, (Collins Business Essentials: New York, 2005) and Clayton M. Christensen, Michael B. Horn, and Curtis W. Johnson, *Disrupting Class*, (McGraw-Hill: New York, 2008)

[28-1] David K. Cohen and Susan L. Moffitt, *The Ordeal of Equality*, *Did Federal Regulation Fix the Schools?* (Harvard University Press: Cambridge, 2009)

[29] Steven G. Blank, *The Four Steps to the Epiphany* (cafepress.com: Foster City, CA, 2006)

[30] "Startup Genome Report 01, A new framework for understanding why startups succeed," May28, 2011, http://startupgenome.cc/pages/startup-genome-report-1

[30-1] Tim Brown, *Change by Design* (Harper Business, New York, 2009);

Roger Martin, *The Opposable Mind* (Harvard Business School Press, Boston, 2007);

[30-2] Thomas A. Stewart, *Intellectual Capital*, (Currency Doubleday: New York, 1997)

[31] Jeff DeGraff and Shawn E. Quinn, *Leading Innovation* (McGraw-Hill: New York, 2007)

[32] Stephen Goldsmith, *The Power of Social Innovation* (Jossey-Bass, San Francisco, 2010), p 105

[33] C. K. Prahalad and M. S. Krishnan, *The New Age of Innovation*, (McGraw-Hill: New York, 2008), p 11

[33-1] Eric Ries, *The Lean Startup*, (Crown Publishing Group: New York, 2011)

[33-2] Douglas Thomas and John Seely Brown, *A New Culture of Learning, Cultivating the Imagination for a World of Constant Change*, (Create Space: Lexington, KY, 2011)