

## Integrating Patents into Value Improving Practice

Raymond D. Gilbert P.E. M.B.A. SAVE Fellow



Ray Gilbert is a registered professional engineer in states of Virginia and Washington. His engineering degree is from Oregon State University and his MBA is from Stanford University. Ray's private sector experience included General Electric @ Hanford Wa. and Value Analysis consulting with Roy Fountain's Value Programs for Industry.

His military duty included radar avionics and his Civil Service career was engaged in experimental demonstrations of the initial Value Engineering Services Office for Office of the Secretary of Defense (OSD). His team evolved into the Product Engineering Services Office for OSD that worked out operations for Value Engineering in research and Design-to-Cost task force efforts. That team initiated a Production Readiness assessment discipline that was employed by the Defense Acquisition Board. Ray has 9 patents and is a registered patent agent.

### ABSTRACT

Total processes for Value Analysis are parallel to processes for generating high-value patents. The managerial skills for drawing high economic returns from Value Engineering Change Proposals (VECP) are parallel to the managerial skills for building patent properties of individual or corporate profit centers.

A "Value Improving Practice" would add a remaining portion of 20-year patent lifetime to selected 3-5 year VECP income life.

Harnessing the full cooperative, inventive power of professional contributors calls for leadership that offers "a piece of the action" personal "incentive".

### TWO "VALUE-IMPROVING" PROCESSES

Managers of Value come to understand that:

(1) Processes of VECPs are compatible with processes of U.S. Utility Patents:

VECPs evolved from principles in patent law.

Similarities strengthen one another.

Differences extend their economic power.

(2) Patents become properties of high value within present research and licensing markets.

**Example 1: Profit-driven US Industries have altered the corporate position of Intellectual Property.**

A general high-tech firm's reorganization to enhance bottom line, moved their Intellectual property organization from a working division of their legal department to a corporate division, reporting through a Vice President level and responsible for a corporate-level profit line.

One electronic industry corporation was reported to have earned 1/4 of its total profit in some years from its licensing of intellectual property.

Texas Instrument and Motorola represent electronic producers with policies of equity for patent-ownership to stockholders and from inventors.

Equity toward inventors starts with incentive-level compensation for professional contributors: A person who is inventor or part of inventor team is awarded:

\$1,500 at patent application.

\$ 750 at patent assignment

\$ 750 as part of \$7,500 for every 10 inventions.

Total \$3,000 per invention (or part thereof).

**Example 2: Federal Government**

Federally-employed scientists and engineers may assign commercial rights from their inventions to Cooperative Research and Development Agreements (CRADA). One Federal agency (NIH) has grown its annual royalty income to \$40 million; net \$20 million.

Present law permits Federal employees to accept commercial royalties to augment their regular salaries by as much as \$150,000 per year per employee.

**Example 3: Universities**

State University of New York (SUNY) @ Binghamton shares 40% of royalty funds with inventor(s), and conducts the marketing efforts.

Virginia Tech & Va. State Univ share revenues equally between inventors after expenses for patenting, marketing and development. (1991)

Note. Not all universities disclose their full policy re intellectual property agreements on internet.

**Example 4: Historic Contrasts:**

Founders of Edison Electric, RCA, Bendix and Hughes corporations used patent property for license-based income, but seldom attributed market success of the invented products to their inventors.

Ownership of industrial patents was arranged by signed patent agreements at employment of experts or scientists. Until recently most such patent agreements meant assigning all intellectual property to their employer for a token consideration.

Ownership of industrial patents that were inventions of shop persons without written employment agreements often were allocated to employers according to "common law" of "shop rights". This means that if an employee used employer's assets or materials or paid time of the employee to develop his invention, the employer had a claim on ownership of the resultant property.

However, examples 1-3 above reveals a modern paradigm shift in motivation relating to special economic gain from the invention process. Our modern era of corporate downsizing among well-educated, growingly-independent employees has built a greater equity environment for inventors.

Responsible managers must consider an individual's perception of equitable sharing, and "do right voluntarily" if he expects his high-value performers to stay with his team, and to be proactive in generating value-added intellectual properties.

Processes for both VECs and Patents work in a province of idea people, where their intended outcome is "Intellectual Property".

A past paradigms of long-term loyalty is now traded for anticipated equity in shorter terms.

Where an inventor's offered incentive is perceived as not equitable, an economically-motivated person, with invention talent may reasonably opt to refrain from sharing his insights with his employer's representatives.

The remarkable rate of recent US business growth offers pragmatic evidence that a benefit-sharing equity paradigm has shifted.

(3) VECPs share benefits between contractors and government agencies..

Virginia has improved return-on-investment from 10 to 1 in its first year of Value Analysis (VA) to more than 60 to 1 by its third year. A VA discipline within professionally excellent talent yields robust economic strength within research or construction.

(4) Defense Department authorized a deviation within FAR 48.001, 48.102, 48.104 & 52.248.1. The deviation authorized a 2-year test of adjusted VECIP incentive rules for a greater contractor share of savings for longer periods.

The US Office of Management and Budget (OMB) had assessed the historic net cost improvements from VECPs of the Department of Defense (DOD) to be far below their technical and business promise.

Mr George Fouch, original sponsor of VE within DOD, often spoke of a necessary team for success, comprised of opportunity conditions, managerial incentives and effective processes.

Opportunity conditions have been materially altered in the electronics realm by Dr Perry's doctrine of preferred commercial specifications..

This doctrine of acquisition policy, particularly for electronic assets, reinforces Value Analysis findings that commercial electronic standards offered great economic benefits for Defense.

Managerial incentives offer more generous sharing to prime contractor and subcontractors.

[Relationships of equity about VECP generation between contractors and their employees has not been addressed by the federal customers.]

In the meantime, State-level VE efforts reveal that great rewards can come from application of VE to the non-electronic world.

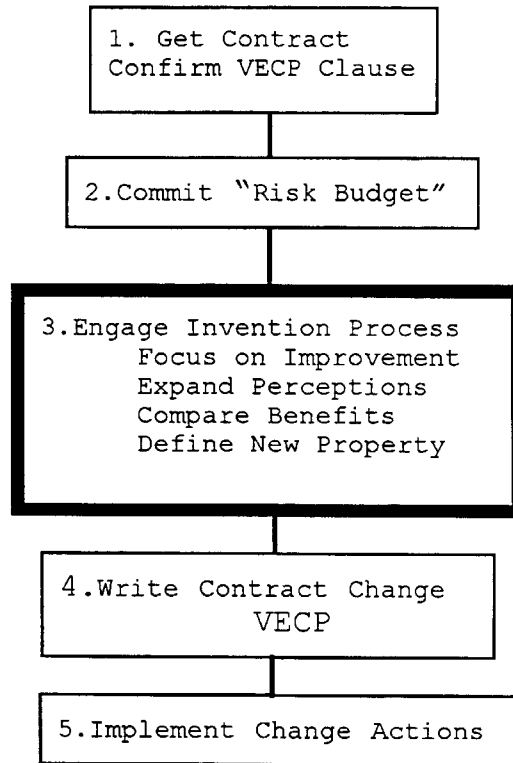
(5) A common-core process behavior applies to the work of both VECP or patent generation. This behavior engages an "Invention Process" which has been the subject of inquiry since the origin of our scientific era.

A manager's most critical tasks may be limited by availability of appropriate talent. Work teaming within the VECP and patent generation processes amplifies dollar benefits from critical talent.

COMPARISON of PROCESSES

The following 3 charts describe VECP and patent processes. They have uniqueness and mutuality.

Chart 1  
A flow chart of the VECP process could be:



(1.1) A first prerequisite for a Federal VECP award is to be a contract holder of a specification. An engineering change proposal (ECP) would change the specification.

A second prerequisite is to include a VECP clause in the contract. The contract must also include a VECP clause. A "Value" ECP would result in a net cost reduction to the customer.

(1.2) A VECP clause reflects a Federal Acquisition Regulation (FAR) that consideration for award includes risk by the contract holder in funding development of the cost-saving proposal.

(1.3) The VECP process usually engages aspects of an invention process, as expressed in the "scientific method", "value analysis job plan" or other method discipline. An output from this sub-process is expected to reveal a more-effective item or process that may include a new intellectual property.

(1.4) A contract change occurs as the buyer and seller come to agreement on both the nature and extent of the change.

The sharing ratios are currently in a transition from fixed rules of “half for 3 years” into a case-by-case negotiating mode wherein caps extend up to “all for 5 years:”

A VECP negotiation uniquely includes consideration of seller’s risk for having invested talent and funds outside the bounds of the contract in search of means for responsible cost reduction.

Where a subcontractor similarly invests outside the bounds of a contract and finds net benefit to the customer by altering a specification, the “VE” economic contractor benefit is shared equally between the subcontractor and the prime contractor.

[The VECP regulation cites a potential relationship between a customer and contractor (including a sub-contractor. It does not, and perhaps should not yet address the notion of royalty sharing between contractor-employers and the inventors of the VECP.]

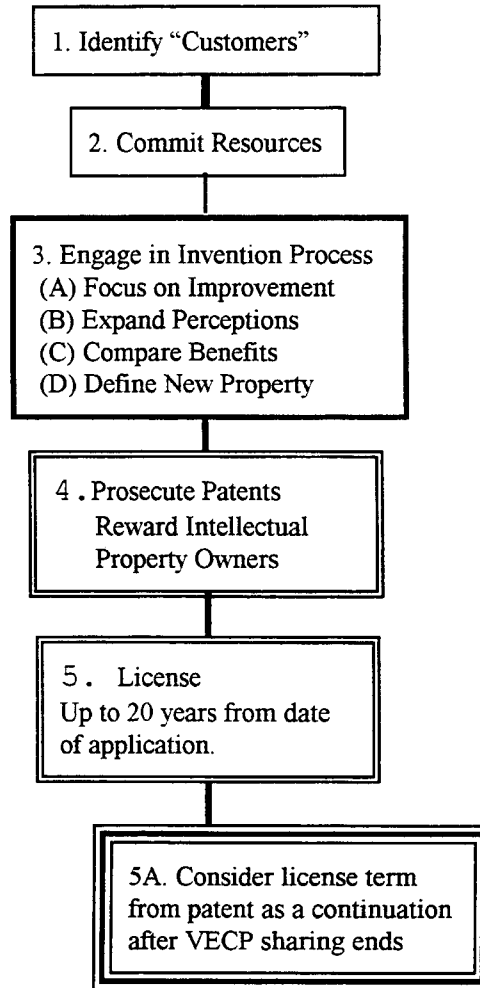
(1.5) Implementing VECP contract change is usually performed on the customer’s budget and to a customer-authorized schedule.

Internal implementation may involve distribution of the incentive award from the prior Value Engineering contract changes into:

an account for future risk-investments, a corporate profit distribution, managerial incentive response, and motivation programs to recognize and to publicize innovations and their contributors (inventors).

Chart 2

A flow chart of the Patent Process could be:



(2.1) A prerequisite for process of getting a patent is an application date that is less than one year from a disclosure of the patent content into the public domain.

The US Patent process is intended to generate value-adding and income-producing assets

Since any sale demands a customer, getting the customers for a new item or process calls for identifying and characterizing real needs.

[Confidentiality agreements provide pre-patent basis for trust between an inventor or inventor-agent and a customer of the anticipated patent property.]

**(2.2) Converting an idea into a strong patent commits human as well as financial resources.**

**Most manager’s “idea people” represent most-important resources. When the idea people are not fully-committed to operational issues such as probable competition, they should be considered for commitment to the “invention process” for both VECPs and related patents.**

**A leader’s team-building strategy may focus “idea people” to high-value causes. Retaining those people demands an equitable reward structure that might share benefits from Intellectual Properties.**

**The Futurist magazine related a reversal of the Pareto distribution (and expectation) of wealth sources in the US.**

Sources of Wealth	1950	1990
Inherited	80%	20%
Earned	20%	80%

**(2.3) The US enhancement of life-style is attributed, in significant part, to intentional engagement of the invention process.**

**Four characteristics of the invention process are common to both VECPs and patents:**

**(2.3A) A focus on improvement,**

**Marvelous new information agility permits the invention process to be focused on improvement.**

**Professionals in all fields are now expected to be skilled in the cyberworld. Obsolete methods, products and costs cannot be long hidden.**

**Someone will find competitive enhancements and tell others.**

**Managers of Value build and retain competitive advantage by their focus of internal resources on timely improvement.**

**(2.3B) Expanded perceptions,**

**Expanded, broadened or altered perceptions are the yeast through which the invention process operates.**

**Insights into Architecture and early Value Engineering were driven by Louis Sullivan’s “Form Follows Function” (FFF) truth.**

**Sullivan observed that a steel-wire bird cage could support unusual compressive loads. This perception led to his invention of the first steel-reinforced “sky-scraper” building.**

**US market for electronic products has rewarded designer/builders who pursued FFF and other “higher truths” to capture and retain world-wide competitive leadership through good science and timely innovation.**

**An even more complex understanding of biological design opportunity is bringing better health to the World.**

**(2.3C) Comparison of Benefits,**

**Trade secrets compete for benefits of invention. However, employee turnover and downsizing erodes value and viability of trade secrets. Patent disclosure enhances the public good. Our present acceleration of technology often makes patents obsolete before completion of their legal life.**

**The US patent system has made possible a heretofore unknown growth in National strength and citizen wealth.**

**A Value Analysis technique offers figure-of-merit (FOM) measuring technology that expresses an idealized minimum cost of a needed function. [Actual costs of most items or processes exceed this ideal cost/function by great multiples.]**

**A FOM can reveal a large value-gap between “value of a function” and present cost of items that deliver the sought function. The value-gap will reveal areas of opportunity suitable for VECP and possibly patent actions. Such FOM analysis can renew the invention process toward greater value contribution.**

**(2.3D) Definition of new property.**

Defining new Intellectual Property is the completion of the invention process. An exhilarating by-product of an invention experience is the act of sharing the new precept with others. An exacting by-product is the patent application.

**(2.4) Prosecuting Patents**

The US Government issues utility patents to inventors whose application meets legal and procedural criteria.

Approximately one-fifth the US patents are issued to "small entities" that include small business, university laboratories and independent inventors.

Many independent inventors are knowledgeable in technologically, having been prior employees of University laboratories and US corporations.

**(2.5) Owners of resultant Intellectual Property (IP) may license the right-to-make and right-to-use for 20 years after date-of-application.**

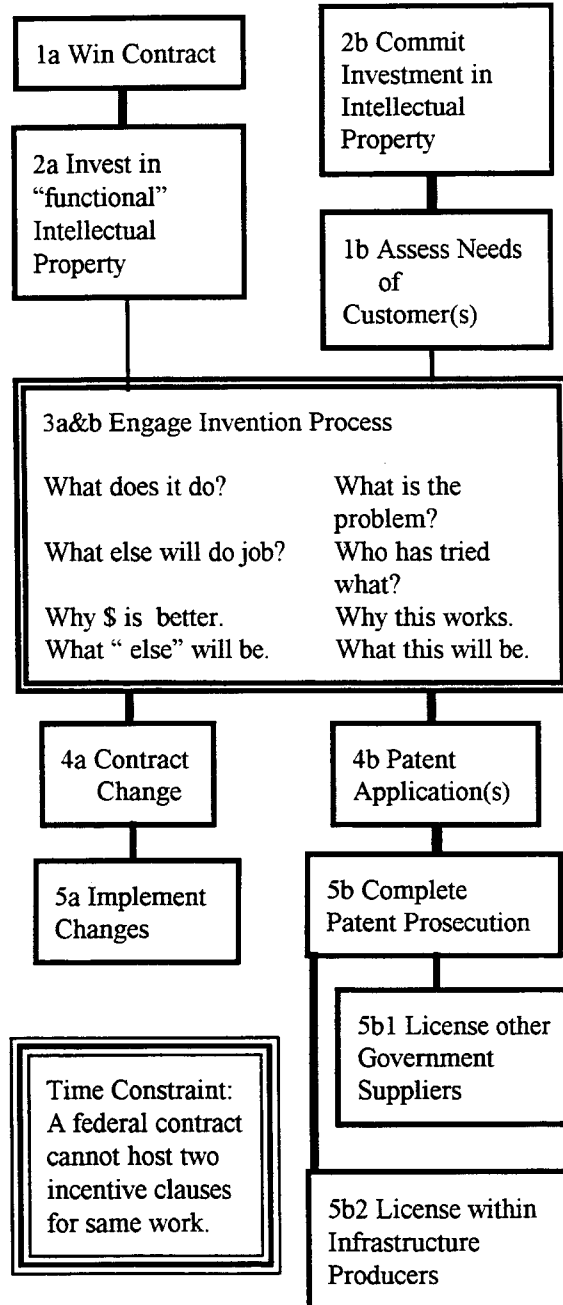
**(2.5A) Contractors having VECP opportunity might consider augmenting its reward structure with patent application and prosecution while the VECP is in operation. Royalties for such invention are thought to be negotiable after termination of the VECP award period.**

**Timing Criteria: A sales offering or public disclosure of a potential intellectual property starts a one-year limit on patent application.**

**Many managers are unwilling to discuss licensing until after award of US patent. Patent prosecution may take as long as 2 years or more.**

**Chart 3**

*A combined flow chart for VECP and Patent Processes could be:*



**Note that there is a logic and economic merit in combining process for VECP and Utility patents.**

**The invention process of chart 3.3a&b uses very early Value Analysis questions that can be applied to very sound patent properties.**

Close similarities of the patent system and the VECP system offer opportunity for an understanding oversight of both. The processes of disciplined patent prosecution would help insure timely benefit within the processes of VECPs.

Acquisition rules do not preclude incentive or license fees for same property, so long as valid "right-to-use" awards are not concurrent within a contract.

#### NEW PROGRESS

VECPs employ the same structural elements as their parent: the US patent. Accelerated prosecution and shorter-term reward-sharing through Federal and State VECP contract clauses has been a valuable learning experience by Business and Industry.

Patents might now become an objective, equitable reward to talented, creative, value-knowledgeable inventors with contract authority to generate and benefit from VECPs.

#### QUESTION?

As Defense contractors obtain greater benefit-potential from an enhanced customer-incentive, is it likely that their incentives will be extended in some equivalent royalty to the actual generators of high value VECPs?

This author believes that adept managers will focus a growing share of their highest-talent resources to generate patent-quality, VECP-type "intellectual property". This makes sense when such property can be prosecuted into a basis for regular patent licenses.

#### GOOD NEWS About PATENTS

Timely prosecution of patents has become a better organized, more simple and objectively structured process over the past 20 years.

The USPTO and IBM corporation have opened availability of patent records and instruction.

Web-sites ([www.USPTO.GOV](http://www.USPTO.GOV)) and ([www.patents.ibm.com/](http://www.patents.ibm.com/)) provide a direct, no-fee channel for patent search.

The USPTO also has provided complete patent records on CD-ROM in 83 US depository libraries.

Many Inventor organizations now provide mutual help to their members and friends.

The Inventor Network of the Capital Area (INCA) operates an internet web page "<http://inca.interspeed.net>" that provides direct links to other internet pages considered useful to independent inventors.

Examiners are willing to talk directly with inventors and help them find the likely art definitions for their search.

US Patent Office practices now offer a "pro-se" prosecutor [of his own patent] to let an examiner prepare one or more acceptable claims, based on the application content.

Language of claim writing has become sufficiently structured to improve strength of US patents.

Modern claim language is used by some inventors as an orderly means to assure that specifications are sufficient to support strong final claims. Final claims and their negotiation merits contractual employment of highly skilled professionals.

Recognition of patent value since 1986 [the Federal Technology Transfer Act (FFTA) of 1986] has led grant-holding Universities to make royalty sharing into a generous source of income for commercially successful inventors on their staffs.

Note. The patents act 1977 of England offers an offshore model for patent equity to employees.

An employee is not automatically entitled to reward from invention made in the course of employment. However, — if the employer got a "provable, outstanding benefit" from a resultant patent, the employee-inventor may win a compensation order according to Patent Rules 1995.

The Patent court assesses a value that is payable under court order.

**C O S T S and V A L U A T I O N of PATENTS**

Approximately 1/5 current US patent applicants fit "small entity" category. They have fewer than 500 employees, and may apply for their fees to be reduced by half. For a small entity utility patent, these USPTO fees, as of Dec 1998 are:

Application Filing:	\$380
Utility Issue	605
Maintenance @ 3.5 yr	\$ 470
@ 7.5	950
@11.5	1,455

On the other hand, total corporate costs for generating a patent may average \$20,000.

This may include:

- Salary costs of the inventors,
- Overhead and direct costs of supervisors and staff persons including invention screening committee
- corporate patent counsel
- testing and drawing services,
- USPTO fees at full rate plus the pre-licensing awards to inventors.

Internet comments reported an average asset value of a completed corporate patent to be approximately \$200,000 at time of issue.

**INVENTION MANAGEMENT**

Universities and corporations that seek license income from employee inventions often organize an Invention Management Staff (IMS).

The IMS processes inventions among anticipated license customers from time of application through patent issuance and one or more maintenance fee periods.

Their marketing effort tends to be tailored to a major focus of customers. They screen offered inventions for property of sufficient value and they manage the cost and processes for converting the selected inventions into Intellectual Property recognized by USPTO and other National Patent Offices.

Patent-license royalties have become a major corporate income source to research laboratories in electronics, software, and biotechnology.

**CONCLUSIONS:**

Special economic merit can be found in combining process for VECP and Utility patents.

The report-writing rigor demanded by patents will help insure viability of VECPs.

A continuity of award and royalty is expected to strengthen respect for an at-risk invention process attendant to Federal contracts.

CRADAs have formalized the transfer of technology from Federal and University laboratories into licensed private sector commercialization entities. Resultant growth in business income has changed the perception of appropriate property management.

The CRADA law and process has brought federal recognition to a business strength from a disciplined licensing process.

The CRADA approach to royalty sharing is altering prior paradigms of inventor motivation through ownership rights.

A changing paradigm of anticipated inventive contribution can be seen to alter the individual's role in the creating more US Wealth through VECPs and patents.

Copyright RD Gilbert PE, March 2, 1999