

INNOVATION STRATEGY AND CORPORATE STANDARDS MANAGEMENT

Abstract: Centralization is a dirty word. For many it conjures up images of bureaucracy, inertia, and socialism and all its perceived and attendant ills. Yet, corporations do centralize many critical functions, and they do direct functional policy and practice from this perspective— planning, hiring, and supply chain management are some examples. In this article I attempt to make the case for a Corporate Standards Practice, in the context of corporate objectives, innovation strategy, research and development investment, and the need to generate a return on investment from these programs.

I'M HERE FROM CORPORATE...

And I'm here to help. Anyone who has worked in a large organization will recognize the disbelief, smirks, and outright hostility that statement can provoke. After all, corporate people are those who look past the great collateral you just produced and point only to inappropriate use of the company logo; they make you travel on every airline but the one you have the most frequent flier miles on or the one that gets you there quickest; they make you sign up for the health plan your family doctor isn't on; and they make you use computers you hate. All of this because the organization must have standard ways of doing things to achieve some mysterious benefits they call scale and leverage. And along the way— they bounce your expense reports. Small wonder then, that for business unit and field personnel, the person from corporate is typically seen as someone to work around, not with.

While the relative merits of decision making in centralized corporate versus distributed business unit models have been and will be argued through time, the need for a commercial corporation to grow profitably—relative to public or private investor expectations and the competition— cannot be contested. Corporations essentially manage two curves: revenue and costs. Of the two, revenues are susceptible to competition, economic, and other environmental factors, while costs are more clearly in the corporation's

control. Therefore, if centralization offers supply chain efficiencies—as demonstrated through volume procurement, headcount rationalization, or process streamlining—corporations will pursue that path.

Standards however present a whole new challenge. On one level, they are part of the supply chain. Corporations can mandate, for example, that all ICT purchases must be standards based solutions and leave it at that. In this scenario—which I will refer to as *ICT Consumption*—the purchase goals are interoperability, eliminating reliance on proprietary technology (“lock downs”), and the ability to pick and choose between multiple vendors for the best applications based on the relevant standard, the lowest price, and the best support. In these situations ICT is a key enabler—it provides more, better, faster information and communication for decision making—but it is no more than that. The consuming entity provides non-ICT products and services, perhaps consumables like soap, hamburgers, and paper products or constants like books, paper clips, and picture frames. Other than ensuring that their offerings comply with any mandated national standards, Underwriter’s Laboratories (UL) and its equivalents in specific markets for example, such entities have limited if any interest in the development of ICT standards. In these situations, centralization reduces to specifying purchase criteria, selecting the vendors, and negotiating the deal.

Conversely, private corporations backed by venture capital or those that appear on the many Tech 100 lists have acute interest in participating in the creation of ICT standards. In this scenario, which I will refer to as *ICT Production*, corporate business models, market valuations, the ability to maximize shareholder value, and long-term survival are at stake. Such entities deal daily with what Sir Harold Wilson, an ex Prime Minister of Great Britain, called the “white-hot heat of technology.” The onus here is to not burn— by innovating and monetizing the upfront (often substantial, but usually speculative) investments in new technologies, through increased sales in existing markets, the launch of new products and penetration of new markets, and incremental revenue streams and profit pools based on intellectual property Licensing, for instance. Various authors and commentators have noted the core relevance of standards development to these objectives.¹

At the base, while not all IP is created for industry standards, all ICT standards contain intellectual property and patents. Accordingly, ICT Standards can, if staged properly in a category, be the key vehicle to monetize the upfront dollars invested in development either through the disruption of competitor business models based on the licensing of intellectual property embedded in an existing standard or the creation of “end run” markets that bypass current product/market paradigms.

The numbers are gigantic. Independent studies indicate that:

- US firms spent about \$194 billion in Research and Development in 2002—a year in which budgets were severely constrained due to the post-bubble meltdown.
- Patent filings globally are in excess of seven million annually (but 90% of these filings are for protecting the same patent in multiple patent regions) and the US Patent Office receives more than 300,000 filings per year.
- US firms spent \$45 billion in 2001 just to prosecute and maintain patents.
- By 1998, revenues attributable to licensing of intellectual property had reached \$100 billion worldwide.
- IBM, the habitual US leader in annual patents granted, surpassed \$1 billion in annual licensing revenues in the late 90s and has, during the past ten years, generated in excess of \$10 billion in *bottom line contributions* from IP licensing.

We should note that these numbers measure R&D and patents across all industries, not just in ICT alone. But the point is clear. Intellectual property is a big business, with real revenue and real profit streams—and in the long run, realization of return on investment (ROI).

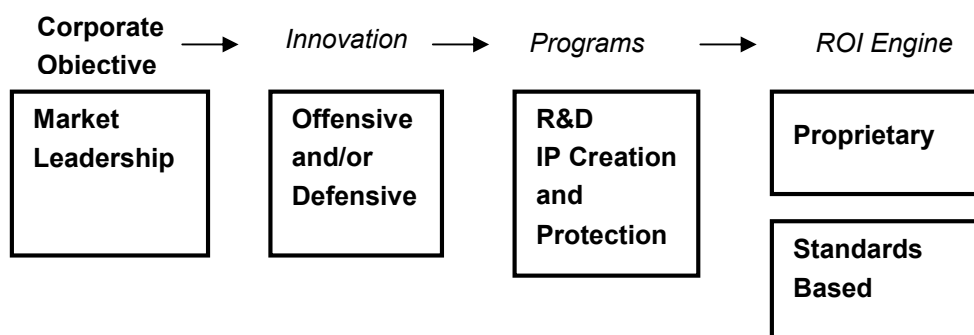
The question, then, is how IP creation relates to corporate objectives. According to *Technology Review*, an MIT publication, IBM, for instance, spent \$5.3 billion on R&D in 2002, the highest absolute number among IT firms, but at 6.2% of revenues lower than Sun Microsystems (\$2.1 billion, 11.5%) or Microsoft (\$4.4 billion, 17.3%). Either way, these huge numbers represent upfront, speculative investment with the *potential* for future monetization through the creation of intellectual property. These investments dictate a Hypothetical Imperative,ⁱⁱ which, to paraphrase Kant, is a “conditional rule of action, concerned with means and ends rather than with duty for its own sake.” Translated, this means that corporate executives must correlate their means (investments) to ends (returns). IP incorporated in a standard is such an end, as is IP in a proprietary play. In the next section, I explore the relationship of ICT intellectual property creation to corporate innovation strategy and standards leadership.

INNOVATION STRATEGY AND STANDARDS LEADERSHIP

Commercial corporations can pursue six alternatives with regard to innovation strategy. These six alternatives—Offensive, Defensive, Imitative, Dependent, Traditional, and Opportunist—are summarized in Figure 2. The extent to which each innovation strategy supports corporate goals and posture, and ICT orientation and standards leadership is also indicated.ⁱⁱⁱ I have categorized ICT orientation as *Producer, Adopter, or Consumer*, and ICT Standards Leadership on a *Must Have to Not Relevant* scale.

Innovation strategy stems from corporate objectives and goals. For many ICT companies, these objectives and goals flow from the relative need to demonstrate market leadership, technology leadership, and to convert these positions to measurable ROI. If a company chooses to be a leader, it is implicitly establishing R&D and the generation of IP as a mission critical program. Once IP is generated, the corporation faces the option of maintaining that IP in a proprietary mode, or pursuing formal or community driven standardization. As illustrated below in Figure 1, whatever the decision, the corporation must establish a high profile in the standards world, if only to understand the value of the IP relative to any options available and the means (licensing model) by which ROI will be generated.

Figure 1



Returning to the Innovation Strategy options, given the typical mix of products, business segments, and customers most ICT producing corporations are involved in, a single innovation strategy is unlikely to apply universally. A more rational selection might involve a “portfolio of strategies,” balancing Defensive, Offensive, Imitative, and Opportunist Innovations against perceived long term goals, opportunities, and threats. Companies not involved in ICT products and services can typically include each alternative in determining which path to pursue. The pressure is not so acute here to be in the top tier of companies offering solutions with differentiated technology or solutions incorporating proven technological advances.

Companies with ICT at the core of their offerings typically do not have all these options available. Whether the product category is semiconductors, routers, computers, consumer electronics, operating systems, or computing infrastructure, the companies involved win top tier positions at least partially (in some cases in large part) because of their technological prowess and their ability to create and harness IP in their solutions. The phrase “Innovate or Die” characterizes their orientation, assuming a top tier market position is required. And it typically is—many firms abandon markets unless they can capture and maintain the number one or two position.

Of the alternatives identified, neither the Dependent nor the Traditional innovation strategies offer any realistic choices for companies in the ICT space. As their description implies, such strategies are better suited to companies not involved in high-technology industries (i.e., businesses where products are static or custom/customer driven). The strategies are also incompatible with typical ICT company goals of technological leadership, marketing orientation, and commitment to offer products and services of excellent quality and value to customers. Companies pursuing these innovation strategies either adopt or consume ICT, and standards leadership is either not desired or not relevant.

In relation again to ICT companies, both the Imitative and Opportunist strategies are also of limited applicability. While the Imitative Strategy is one that many companies have successfully followed, the reliance on acquired designs and licenses, which can be lost or revoked, may eventually force the corporation to concentrate more on its own, in-house innovations. In the baseline however the company is choosing to adopt non-company IP and standards leadership is not necessary. Similarly, the Opportunist Strategy offers the option of following multiple niche market development strategies, but it is of potential only if a second or third tier position is acceptable and it negates the possibility of an impact entry in evolving markets, with attendant forfeit of early revenue and profit. Here the company straddles the adopter/producer border and so a standards leadership position may be necessary.

Fundamentally it follows that only the Offensive and Defensive innovation strategies are available as choices for the corporation that desires to produce ICT and bake this output into industry accepted standards (*de facto and/or du jour*). Whereas Offensive innovation offers the ability to capture and hold markets as a first mover, it also carries inherent and sustained risk—the risks associated with this strategy again militate against its consistent selection. In this scenario, standards leadership is a “must have.” As a natural and ongoing process, therefore, Defensive innovation may prove to be the most viable alternative. Although the risks associated with this strategy are also high, they are balanced by the fact that neither profitability of new ventures nor the company's overall technological position are sacrificed, *provided* it is able to react quickly and effectively to trends in the market. Here standards leadership is not as critical—participation is a must but leadership is “nice to have.”

Figure 2
Corporate Innovation Strategy and ICT

Innovation Strategy	Goal	Posture/Capability	ICT Orientation	ICT Standards Leadership
OFFENSIVE	Achieve Market & Technology Leadership	Strong R&D Investment IP/Patent Monetization First Mover Market Benefits	Producer	Must Have
DEFENSIVE	Improve and Leapfrog Others' Innovations	Strong Development and Design Product Differentiation Fast Follow Market Entry	Producer	Nice To Have
OPPORTUNISTIC	Deliver Solutions for Identified Gaps	Entrepreneurial Focus Exploit Opportunities Serve Rapid Change Markets	Adopter/Producer	May Need
IMITATIVE	Emphasize Licensing and Acquiring Know-how	Strong Integration Engineering Compete on Lower Unit Costs Serve Captive Markets	Adopter	Not Necessary
DEPENDENT	Follow Customer Input, React to Specified Needs	Strong Customer Interaction Low Overhead Serve Niche Markets	Adopter	Not Desired
TRADITIONAL	Deliver Static Products	Strong Process Focus Craft Skills Serve Volume	Consumer	Not Relevant

Note: The first three columns of this table are adapted from "The Economics of Industrial Innovation," Christopher Freeman (Penguin)

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If this linkage proposed in this chapter between corporate objective, innovation strategy, IP creation and protection, and ROI generation is accepted, the question that must be resolved is the management model as related to the steps beyond objectives and strategy setting. As noted before, R&D spending— the engine for IP creation— is in the \$200 billion range in the US alone. With spending at individual big companies in the mid-multibillion dollar range and expenditures representing between six and eight percent of sales on average, corporations have traditionally chosen to manage the R&D effort centrally as a corporate function. In some cases they have even centralized the conduct of R&D in a specific structure (e.g., Bell Labs in days gone by). This corporate direction is geared to linking the steps in the objectives-strategy-funding steps in Figure 3 as expected, given the large number of patents granted annually—IBM obtains more than 3,000 patents annually by itself. So the corporation is simply executing the right asset management model in centralizing the function in the corporate domain.

Traditionally, however, corporate management and direction has stopped at IP creation and protection. Where corporations have chosen to generate ROI through standardization programs, the actual participation and representation in standards bodies has been left to the individual Strategic Business Unit (SBU) responsible for a particular market. In the next section, I highlight the large internal fragmentation risk this approach leads to and present a case for corporate standards management.

CORPORATE STANDARDS MANAGEMENT— A MODEL

To begin, it is necessary to provide some context. Until the early 1990s, ICT standards were created almost exclusively by national (ANSI, BSI), regional (ETSI), or international (ITU, ISO) Standards Setting Organizations (SSOs). Much of the activity focused on telecommunications, as the “I” in ICT was still evolving. In these early days, decentralized corporate divisions (Strategic

Business Units, SBUs) drove participation in SSOs and customers required the support of standards in products and services. If a supplier supported a standard that a customer mandated and won sales as a result, the SBU went further in meeting or exceeding corporate performance expectations, the corporation delighted the market with better results than expected, and customers received greater assurance that their purchases would interoperate and not be subject to orphaned/proprietary/monopolistic behavior. While this translated to a win-win for all concerned, standards in this era were effectively a *sales tool*.

Telecommunications deregulation and the Internet changed everything. As sizable markets evolved around new technologies, many corporations began an earnest examination of their “dusty patent” portfolios and, in some notable cases, attempted to extract royalties from suppliers who had—often inadvertently—incorporated patented IP in their offerings. Thus, by way of example:

As Information Services markets expanded, a company attempted to assert patent claims to Dual Tone Multi Frequency (DTMF, Touch Tone to most of us), which enables such services to work.

- As Video Conferencing began to grow, various companies asserted claims to the IP in the Audio and Video Codecs embedded in standards approved even at the ITU-T level.
- As HTML and browsers unleashed the World Wide Web, a large European company asserted ownership of the patent for hyperlinks—the function at the core of the web.

It is important to note that these actions were reactive (i.e., they occurred after the royalty/licensing revenue potential of IP in standards had become apparent). Something like this also happened in the Rambus/JEDEC case, where a proposed SDRAM standard was the subject of FTC antitrust action due to the alleged deliberate non-disclosure of key patent applications, and the attempt to extract licensing revenues by the patent holder after the standard had been approved.

With the parallel growth of de facto standards like Windows and fundamental technologies like Java and LINUX/Open Source—each governed by different licensing schemes—standards completed the transition from “*sales tools*” to “*ROI Engines*” and “*Business Model Enablers*.” Consequently, the value of IP baked in community driven and SDO/SSO approved standards started to become apparent. Companies helped create standards by gaining community support for solutions incorporating their IP; they allowed extensions from third parties to fill voids; and they agreed to license their IP in standards approved by the community on pre-established terms

(RAND, Royalty Free, Open Source, Public license, etc). Depending on the licensing model, they either generated licensing revenue for dusty and fresh patents through this process, or they disrupted proprietary or alternative community based standards through it.

Consequently, today, the total number of independent, purpose built, standards creating organizations worldwide is in the many hundreds, if not thousands (note that this is anecdotal, not empirical data). This situation raises a new set of challenges. If participation in these independent organizations is driven at the division level, the corporation as a whole faces tangible risk. In my business, Global Inventures, we incubate and grow communities involved in the creation of standards and provide outsourced resources and management services to such organizations. During this process, we observe the following key issues, which are exacerbated in large Fortune 1000 companies, but not localized to them.

●* **Opportunity Loss.** This frequently occurs the moment a division signs a membership agreement and agrees to abide by the organization's IPR policy. Quite frequently such policies mandate royalty free licenses for IPR incorporated in adopted specifications. This provision triggers when a required disclosure of Necessary Claims in a submission to a proposed specification is not made. Therefore, if the appropriate participation and IPR checks and balances have not been performed at the corporate level, the corporation either loses an opportunity to submit its IP for a specification because the licensing terms are unacceptable, or it loses the ability to generate licensing revenue because the submission is competitively necessary but must be royalty free.

Opportunity loss also occurs in organizations with RAND licensing provisions, because the participating SBU is unaware of IP buried in the corporate patent portfolio that might apply to the organization's standards—in some cases we have seen a competitor's technology receive this benefit.

●* **Strategy Arbitrage.** This occurs when different SBUs participate in overlapping organizations in which the end standards are competitive. We have seen one SBU take positions on proposed technology solutions and IP licensing that inadvertently sabotage a winning position for the other SBU. A variation of the "left hand not knowing what the right hand is doing" theme, the consequence here is sometimes redundancy but more typically unconscious arbitrage of corporate investment in innovation strategy.

●* **Participation Failure.** This occurs because the SBU, managed and measured on a P&L (profit and loss) mandated by corporate financial plans, is either: (1) too focused on this primary mission to be aware of a standards initiative it should be part of; or (2) because it is aware but fails to establish the “mission critical” relevance of a new standards initiative to its future and passes on participation; or (3) because, although it correlates relevance to the future, it is unable to fund participation. All too often we hear—typically from a harried manager charged with delivering results *now*—responses like “we’re too busy to participate” or “someone from my company should be involved, but I don’t know who,” or “ we don’t have the budget, so we’ll pass for now.” Participation failure also occurs when the assigned participant sees the effort as tedium and “a waste of my time” and/or because the assigned participant has, through behavior and personality, tarred the corporation and cornered its position to one of no hope in a submission selection process.

Earlier, I endeavored to establish the link between corporate objectives, innovation strategy, and corporate inventions as defined by corporate IP and patents. Opportunity Loss, Strategy Arbitrage, and Participation Failure represent breaks in this value chain and fatally injure the ability to monetize IP through the generation of incremental revenue and profit pools. For this reason, we believe that standards management **must** be practiced at the corporate level.

What, then, is a best practices solution? I offer the following recipe for consideration.

- ✓ ***Standards management must be owned by the CTO.*** Given the positions at stake, C level ownership is a requirement. For the ICT Producer, this is where corporate objectives translate into innovation strategy, and this is where the resulting technology programs that might ultimately create defensible IP obtain funding support. For the ICT Consumer, this is where corporate objectives translate into technology requirements and the make/buy decisions related to proprietary or standards based solutions are located. In both cases, CTO ownership provides for linkage and leverage from objectives to implementation.
- ✓ ***The CTO should establish a Standards Management Office.*** As noted earlier, the monetization of corporate IP is subject to failure if participation in standards organizations is not properly planned and executed. Our experience suggests the following essential functions to prevent fragmentation and failure:

1. *Landscape Analysis.* This is a necessary first step in evaluating the relative value of standardizing IP or maintaining a proprietary posture. Landscape analysis identifies relevant organizations, “who is doing what” and whether the corporation should participate in these efforts or create new initiatives to support monetization strategy. This step mitigates the opportunity loss behavior we observe frequently and provokes the make/buy analysis we think is essential.
 2. *IP Harvest Plan.* Once standardization opportunities are identified, it is important to establish the IP pool the corporation may already have available— or need to create if unavailable at all, or if the IP is available through competitors. Performed in conjunction with internal legal staff, the Harvest Plan specifies the corporate IP gaps and overlaps that affect the ability to disrupt existing markets and licensing models or create new schemes. This step provides a foundation for systematic competitive gain and a consolidated approach to IP creation and monetization.
 3. *Participation Definition/Approval.* This step develops a “participation package” for the corporation and the SBUs. It includes, at minimum, a clear definition of IP licensing schemes acceptable to the corporation (RAND, Cross-Licensing, Royalty Free, Open Source, etc.) and the structural conditions and guidelines necessary to avoid allegations of antitrust and anti-competitive behavior (for example open membership policy, clearly specified and communicated technology selection process, inclusive participation, action on member proposals). Subject to these criteria, participation in a particular organization can be quickly approved at the corporate level for rapid engagement and traction.
 4. *Budgets and Resource Allocation.* This activity, which should be integral to the annual planning cycle, involves proactive allocation of hard dollars for new and renewal membership fees, special needs based sponsorship of key programs, and to fund resources within the corporation at either the corporate or SBU level to participate in relevant standardization efforts. It ensures the corporation is in the right places with the right people at the right times, and mitigates the risk of participation failure.
 5. *Coordination and Communication.* This activity completes the corporate practice. It requires regular top-down, peer level communications and bottom-up information exchange. Progress reporting and communication at the corporate and SBU levels are essential to ensure that efforts are synchronized, new opportunities or threats are identified, participation is maintained, intensified or terminated, and the right decisions are enacted in light of corporate objectives and innovation strategy. In the absence of this activity, internal fragmentation occurs and the opportunity loss—strategy arbitrage— participation failure cycle takes hold.
- ✓ *The Commitment must be long term.* We observe that corporations tend to pendulum shift their commitment to standardization efforts. While not immune to cutbacks in hard times, quite often this is a result of a lack of understanding of the **role standards play** in achieving

long term strategic goals at the very top levels in a corporation. Funding is seen as an expense versus an investment, and the adverse impact of short-term fluctuations in commitment is not factored into decisions. Absent a long-term commitment and view, one that is correlated to the corporate strategic plan and a key driver therein, such efforts are doomed to “run in place.”

Trends in ICT and independent studies validate the value and continued adoption of this approach. In the first instance, as ICT becomes more and more complex and specialized, it will become increasingly necessary to establish leading technology positions in evolving or nascent markets to survive long term. This suggests increased investment in R & D and mandates measurable ROI. As indicated here, a coordinated standards management program can be an effective tool to generate and sustain the desired results.

The 2003 results of the annual Line56/A.T. Kearney benchmarking outlook on e-business confirm the potential gains at the buyer level and opportunities for vendors. The study found that e-business now represents 20.3% of all IT spending and that “management of e-business is now most commonly centralized within the corporate technology organization—consistent with the trend towards centralization revealed in the 2001 study.” The study also noted that “those companies with centralized e-business units are not only more likely to have standards definition, but are also more likely to gain adoption of defined standards—smart companies are continuing to invest especially as protocols and standards are more adopted across the organization.”

SUMMARY

Richard Feynman, the Nobel Prize winner for Physics once observed, “For a successful technology, reality must take precedence over public relations, for Nature cannot be fooled.” We also know from Aristotle that “Nature abhors a vacuum.” While a decentralized, relatively autonomous organization structure may in fact be the right way to conduct business, and good public relations as well, the realities of innovation strategy, the substantial required corporate investment in offensive and defensive innovation, and the returns anticipated must take precedence. A centralized standards function provides the most likely success vector under these circumstances. If standards are not managed centrally the corporation takes on the large risks identified here, which in essence create a vacuum addressable by rivals with alternative solutions and monetization trails.

NOTES

ⁱ The Standards Edge ©Bolin Communications 2002

ⁱⁱ Kant also defined a Categorical Imperative, “the obligation to do one's duty for its own sake and not in pursuit of further ends.” Kant’s concern was ethics. Adapted to business terminology and context a Hypothetical Imperative is Categorical. For example, ROI is categorical—and categorically not hypothetical.

ⁱⁱⁱ Innovation Strategy, Corporate Goal, Posture/Capability are my summaries from *The Economics of Industrial Innovation*, Christopher Freeman, Penguin Books, 1974, ©Christopher Freeman. Interpretation errors and omissions are my responsibility. Christopher Freeman was Professor of Science Policy at the University of Sussex, England.

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Deepak has more than twenty years of ICT industry experience with leading European, Japanese, and US firms. He holds an Honors degree in Physical Chemistry from University College, University of London, and a M.S. in Management from The Imperial College, also in the University of London.