Role of Collaborations, Systems, and the Soul in IP and Innovation

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Many observers in the global business arena have often used the phrase ‘knowledge-based economy’ to describe the current global economic environment. This results largely from knowledge playing such a dominant role in economic growth and wealth creation, especially within the more mature, developed countries. However, based on an ever evolving and rapidly changing business environment, it is more accurate to label today’s business environment as an ‘innovation economy’. The premise is that in today’s global market system innovation is the driver for sustaining economic development and wealth creation. The new global competitive reality no longer has cost and quality as its core decision factors.

To develop a competitive advantage one requires to have a business culture of rapid innovation, collaborative strategies a systematic methodology, and a culture of concurrent change. If one accepts the above premise, then those companies and countries in which innovation is encouraged and rewarded will become or remain the economic leaders of tomorrow. However, it is critical to understand that innovation by itself is neither sufficient nor the only factor. Thomas Edison, one of the most prolific inventors of all time, once said, “Anything that would not sell I do not want to invent. Its sale is proof of utility, and utility is success.” Therefore, the proof of a truly useful innovation is that which beneficially contributes to the economy as is evidenced through a monetary transaction from the innovative source to another entity which values the innovation in some way.

By encouraging a culture of strategic innovation using appropriate due diligence processes, one can help shape an industry to the innovator’s advantage. Strategic innovation does more than extend or defend one’s core business. Table 1 conveys the value of strategic innovation, especially in entities that wish to establish market advantages.

Understanding market needs obviously is critical to help understand what is needed to so impact the market as to disrupt the current paradigm. By focusing innovative energies on products/services, which are valued by customers, and by providing a total solution approach to make it easy for the customer to achieve the end result, innovators increase their probability of success.

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In today’s global market system, innovation is the driver for economic development and wealth creation. The new competitive reality no longer has cost and quality as its core decision factors or drivers. Developing a competitive advantage now requires a business culture of rapid innovation, collaborative strategies, a systematic methodology, and a culture of concurrent change. This is the reality in today’s innovation economy. Commercialization of disruptive innovations is based on integrating unique intellectual property, technical capability, and market needs. Collaborative partnerships between multiple companies incorporating technology, market/distribution, and financial investors are essential to optimize innovation and successful commercialization of technology. Higher value disruptive innovations meet new market needs while pushing a company to new technology and/or capability requirements. Competitive success for innovative technology increasingly depends on speed to market and speed to profits.

Innovative companies must empower technology managers to adopt a business-building approach that connects technology creation to the target market. This in itself is an innovative business model and will require transition in management skills. For an entity to do this, the elements that form the soul of innovation are essential. The soul of innovation, is comprised of:(i) an emotion or passion – as a part of the company culture to innovate, (ii) the mind to innovate – for any innovation to have an opportunity to be commercializable and profitable requires sources of intellectual property and a defined system to capture the innovation, and (iii) the will to innovate, i.e. drive it to the market. The paper further discusses the role of collaboration in innovation and IP creation.

Many observers in the global business arena have of-
The Role of Collaboration in Innovation and IP Creation

Technology is a valuable asset and key to the wealth creation (including job creation) for future generations within any company or country. However, there are many steps between the time basic research is completed and economic value can be created. Technology needs to be nurtured in its creation and managed in its development and implementation to have the maximum, positive economic impact.

The creation of intellectual property (IP) through basic research does not ensure the creation of economic value. Also, in isolation, the economic value created by a given innovator is often not significant for years to come. However, once created, if innovation and those rights to IP are managed in such a way to maximize wealth creation, economic impact is timelier and more significant.

Accelerating commercialization of the technology developed by an innovator is a critical concept to optimize the rewards of the innovation and achieve the requisite economic impact (i.e. wealth creation). This can be done working closely with the innovator and various industry and government segments to find the most beneficial pathway for technology commercialization. In many cases, the IP available for commercialization can have development accelerated through use of collaborative activities thus dramatically reducing the time to create economic value.

A collaborative process is essential to optimize and leverage the critical success factors in bringing innovation to the market. Using a collaborative process one can: (a) assist in finding multi-market interested industrial partners, (b) assist in the management of IP privatization if the IP has been generated in an academic or government setting, (c) work with industry and the innovator to provide feedback on the best technologies to commercialize, after considering appropriate criterion such as market needs and expected wealth creation, (d) work to find resources for application development through government and private sources, and (e) broker a network of validation and seed funding partners or contacts or other funding opportunities, if needed.

Because of the limited probability of an innovation becoming successful in the marketplace (Figure 1), combined with the fact that in most cases a company or individual/innovator lacks a complete set of capabilities to bring an innovative concept/product from the idea stage to full market success, a collaborative approach is needed as it can enhance the probability of success. This is especially true for small and medium sized businesses which may not have the capital, capacity, and personnel to drive the innovation to the market.

Table 1—Value of strategic innovation

<table>
<thead>
<tr>
<th>Assumption in business</th>
<th>Traditional</th>
<th>Strategic Innovation</th>
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<tbody>
<tr>
<td></td>
<td>Business conditions are given – to succeed one reacts and develops strategies after the fact when conditions are known</td>
<td>Strategic collaborations and managed innovation systems can shape an industry</td>
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<tr>
<td>Strategic focus</td>
<td>Build competitive advantage</td>
<td>Disruptive innovation seeks quantum leap</td>
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<tr>
<td></td>
<td></td>
<td>Innovate to dominate a market</td>
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<tr>
<td>Customers</td>
<td>Expand/retain customer base through segmentation &amp; customization</td>
<td>Target valued buyers (i.e. let some existing customers go)</td>
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<tr>
<td></td>
<td>Focus on differences in customer values</td>
<td>Innovate to focus on key commonalities in areas that customers value</td>
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<tr>
<td>Capabilities/assets</td>
<td>Utilize existing assets/capabilities</td>
<td>Remove constraints and leverage assets to accelerate innovation</td>
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<tr>
<td>Product/service offering</td>
<td>Boundary via current industry participation</td>
<td>Innovate beyond current products/services to provide market-driven solutions using collaborations or other innovative approaches</td>
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Fig. 1—Need for the systems
market. By exercising a critical assessment of an entity’s capabilities in marketing, finance, manufacturing, technology, and the overall management team, relative to the targeted market in which the innovation is to be launched a gap analysis can be developed. It is from this gap analysis that collaborative partners could be chosen. That is, where an entity has a gap in expertise or knowledge, one option is to seek a collaborative partner with expertise in that gap and develop a mutually beneficial relationship to leverage the respective resources. By doing a thorough analysis there is an opportunity for establishing a much higher probability of success for the innovation. It is clear, however, that during this collaborative development process, management of IP is critical to maximizing wealth creation for all parties.

EMTEC, a technology economic development firm located in the US, has modeled a collaborative approach that is shown in Figure 2 and is illustrated in comparison to the traditional linear IP development. By approaching innovation and new product development from a non-linear, collaborative method, companies have been able to leverage investments, increase their probability of innovation success, and accelerate their innovation to market. From experience, successful innovation and commercialization can be best accelerated through collaborative relationships and partnerships. As an example, MHI, a small company in Cincinnati, that has invented energy saving furnace concepts for use in high temperature melt and heat treating applications, has utilized the EMTEC method to leverage a $300,000 (US) investment into the equivalent of $1.2 million (US) additional funding to accelerate the proof of concept process and build early products. In the process the company over the past four years has won two separate IR100 awards indicative of peer evaluated innovations judged to be among the top 100 inventions for the year.

Part of the collaborative efforts must be used in integrating relevant information and making it readily accessible to interested parties. This is critical to capitalize on the matchmaking opportunities to fill gaps. As noted earlier, collaborative partnerships are essential to successful innovation and commercialization and to reduce the time to create economic value. Through the collaborative process EMTEC has developed a formal framework to capitalize on matchmaking opportunities, administer and manage IP opportunities. This process has a singular focus on maximizing wealth creation for the IP owners. The key concept is that even the best innovative technologies are unprofitable if they cannot be easily commercialized and diffused into new markets, i.e. speed to market and speed to profits.

A technology commercialization process for pro-
viding economic impact from IP generated from various innovators, be it individual or corporate, is absolutely critical to accelerate the innovation to market. The process must be managed in such a way to maximize wealth creation for the participants. IP for commercialization looks to leverage with an integrated array of other resources including universities, industry, and government research labs. The key areas for successful commercialization of technology are: Intellectual property management, intellectual property review – to make sure the IP meets unmet market needs, industrial matchmaking – to build essential collaborations, application verification – proof of IP utilization, business formation – or new product launch, brokering a network of validation or funding resources with interests towards investing in commercial ventures, etc.

A combination of the ideas – speed to market, speed to profits, integration of IP, technical capability, and market needs – increasingly requires a collaboration of various entities to maximize the opportunities. In capitalistic and other societies, collaboration between variant entities is not a natural process. Using this form of leveraged technology development, in itself, is innovation. Collaborative partnerships between multiple companies that address the issues of incorporating technology, market/distribution, and financial investors requirements are essential to optimize innovation and successfully commercialize technology. The collaborative group must all respectively contain a creative management team to achieve a higher probability of success. This collaborative partnership can provide innovation in either process innovation or product (or service) innovation.

In summary, the role of collaboration in the innovation process is to accelerate the commercialization of the technology developed and to provide the IP owners with the optimized pathway to economic significance.

The Need and Role for Systems

To meet the combined innovation metric noted earlier and summarized in Edison’s quote (i.e. innovative concepts that have market value is evidenced through monetary transactions of the innovation) requires an intersection of, and the ability to integrate, unique intellectual property and technical capability with unmet market needs. As illustrated in Figure 3, an entity that has some innovative technology development or ideas and looks for commercialization opportunities must, as part of the due diligence, consider where in the unmet market need areas the innovation can be applied. Optimized commercialization of disruptive innovations is based on integrating unique intellectual property, technical capability, and market needs.

The best innovative technologies will not be profitable if they cannot be commercialized and diffused into new markets. Higher value disruptive innovations meet new market needs while pushing a company to new technology and/or capability requirements. Nevertheless, competitive success for technology-based companies increasingly depends on speed to market and speed to profits. Strategically, an innovator or company must understand the requirement for the integration of technology development (R&D), commercialization, and innovation opportunities involving market needs, IP, and their technical capabilities. To do a cognizant, defined process and understanding of what comprises innovation is required.

Too often, however, innovators have looked at the pot of gold at the end of the rainbow and viewed their

Fig. 3—Commercialization of innovation: Integrating unique intellectual property, technical capability and unmet market needs
innovation as a mechanism to providing them with freedom of action and excessive income generation. This possessive attitude has often hindered the ability to move the innovation into the marketplace, let alone move it more quickly into the marketplace. A balance of retaining full equity versus the trade-offs to obtain required capitalization to develop and launch an innovation into the market must include in those trade-offs considerations the fair and appropriate sharing of equity or the investors return on investment. This must be a continual decision point at several points in an innovator’s journey to commercialization. To do this on a rational basis requires a system. As is illustrated in Figure 1, a system is needed because, according to the Product Development Association, only one in three thousand ideas are successfully introduced into the marketplace. It therefore makes no sense to spend one’s personal or corporate time, money, and energy trying to move an innovation into the market without an understanding of the probability of success, the critical milestones required for success. Utilization of a system can enhance the probability of success while concurrently offering acceleration of that process.

Traditionally, the system was to do innovation/new product development linearly and the process steps would be completed sequentially (Figure 2). While this could develop an innovation to market success, the time to create economic value was extended. Prior to globalization when each country was less dependent on other countries, this linear, sequential system could be sustained and allowed acceptable comparative growth. However, in today’s innovation economy in which globalization plays such a large role, this sequential system is not adequate because of the extended time to market introduction inherent in the process. Figure 4 looks at three ways an innovator or company can use to move innovation through the system in today’s global environment. Clearly, the pathway to innovation must use concurrent processes to achieve the required speed to market and speed to profits. This concurrent process must utilize a collaborative process.

Sustained economic growth in any country now requires the confluence of many actions by business, academic, government, and non-profit entities—a collaborative effort. Achieving a continuous flow of innovative new products into the marketplace may be one of the most challenging, particularly within the small and medium sized manufacturing sectors of the economy. The odds for successful new product development are particularly foreboding to the small and medium sized businesses.

With the overwhelming probability of unsuccessful products (16 out of 17 from the data in Figure 1) offset by the vital importance for developing new products to establish competitive advantages and sustain profitability growth, it is critical, especially for small and medium sized companies, to embrace the need for new product development processes/systems. These new product development strategies must have executive level commitment from the respective companies and must be integrated into the company’s business plan. New product activity is usually not limited by the number of ideas, but often limited by the company’s financial and/or human resources. A culture for innovation and new product development is essential. Establishing sound methodologies and approaches and implementing enabling tools are crucial to helping these small and medium sized companies in this activity.

Establishing new product development as a competitive advantage in small and medium sized companies can require access to external technology and tools. It is important to reduce front end risk to these smaller companies that do not have the financial and human resources to maintain their competitiveness in the global marketplace. A strong external collaborative network is necessary for successful product development in companies that lack the large corporate infrastructures. Additionally, a well-defined business and product development process is a requirement to assure market, business, operational, and financial factors are properly considered.

Multiple reasons for new product failures include: (1) competitors prove to be more firmly entrenched than initial estimates, (2) over-estimation of the market, (3) inappropriate pricing, (4) insufficient differentiation of the new product from existing products, (5)
inadequate sales, distribution, or promotional efforts, (6) lack of understanding of customer requirements, and/or (7) product performance or manufacturing failures. Understanding these issues and incorporating a well defined and structured development process; can mitigate these roadblocks to allow a more successful innovation.

**New Product Management and Structure**

New product development management must have three primary facets: an innovation concept, new product portfolio management of multiple new product opportunities, and revenue growth to allow additional innovative concepts to be developed. The processes that are necessarily involved are new product review, determination of amount and distribution of those funds available and allocated for innovation and new products, and product development management. Given the quantity of new innovations or product ideas that can be developed each one concept needs to be reviewed as it is important to provide an early red flag on those that have poor market potential or those with unsolvable technical hurdles before expending unnecessary resources. A red flag methodology singles out the ‘deal breaker’ in every innovation or opportunity before larger investments are made. Throughout the entire innovation or product development process responsible people must monitor and review the projects, request additional information, make revision recommendations, advise improvements, identify optional structure approaches, and establish the negotiating guidelines to insure that the company’s portfolio is built on win-win innovation investments. Sometimes a new product advisory group or a collaborative approach can be helpful in this process.

**Business Administration**

Companies must understand and develop a product/project disclosure package that will assist in developing the new product. The disclosure package encompasses the usual project information, any non-disclosure agreements (NDA) needed for potential collaborators as the product is developed. Following this, the companies develop business plans, marketing plans, make a thorough business assessment, technical analysis, risk analysis, and then look at potential deal structure options. In many cases the companies may require substantial assistance in developing their business and marketing plans as well as providing the requested information in a usable format. Appropriately chosen collaborative small business development entities can often work closely with an innovator or company and can often act as the company’s advocate helping them through development issues and provide additional information when required.

**Business Due Diligence Screen**

Due diligence is the process of investigating an innovation or product opportunity for potential further development and/or funding and is the caution any prudent person would exercise with the use of their own money. It begins with a review of the business plan, which should include the following six areas: (1) market structure, competition, and marketing strategy; (2) technical assessment; (3) management team assessment; (4) operating plan; (5) financial review; and (6) legal review to assure appropriate IP or patent protection. Business due diligence should encompass an evaluation of the company’s management, financial position, product market application, profit potential, and investment risk. It is critical that the innovation meets the unmet market needs.

**Technical Due Diligence Screen**

Technical due diligence must concurrently occur with new product innovation opportunities. Technical due diligence should involve not only an examination of the base technology, but also include factors such as commercial scalability, competing market technologies, and costs. To do this technical due diligence, one must have an overall understanding of the new product and its technology, analyse the application specific intellectual property, review any claims related to relevant technology, assess the key issues and hurdles, and develop strategic technology recommendations. The output of this analysis will form the technical portion of the risk assessment and will help refine the new product development approach. The result that companies receive as part of the technical analysis should improve the chances of the new product being successful and reduce the risk to the revenue potential of the innovation. The technology analysis should be interactive with the business due diligence screen to the extent that they assess value impact to the industry, weigh the competitive advantage of the technology or innovation, and ascertain major technology and business barriers to success.

**IP Management**

IP management capability should maximize the po-
potential for return for any identified or potential IP uncovered in an innovation or product development initiative. Appropriate legal advice may be needed to assist in IP review, contract development, and licensing arrangements if needed. Many innovators will need support and advice with respect to patent protection. Assisting innovators and entrepreneurs at an early stage in the innovation process is important in protecting their invention or know-how, avoiding costly and potential litigation later as the technology and know-how are disclosed to the market and potential customers. Innovators must have a confidentiality regime in place when sharing IP relevant to the innovation and it should be extended to include each project’s activities and govern the identification and handling of confidential material. Anyone wishing to discuss any confidential aspects of the candidate innovation or new product must sign a standard NDA.

In general, innovators should focus on new product development that provides return of investment and revenue growth for the company’s portfolio growth (i.e. wealth creation). Once an innovation or new product development project has been funded, the success of the innovation will be enhanced by the continuing support of the company’s management team. This project management and service delivery structure integrates a smooth product development process while maintaining appropriate financial controls on the development progress.

As stated earlier, the best innovative technologies will not be profitable if they cannot be commercialized and diffused into new markets. Higher value disruptive innovations meet new market needs while pushing a company to new technology and/or capability requirements. Competitive success for technology based companies increasingly depends on speed to market and speed to profits. Strategically, a company must understand the requirement for the integration of technology development (R&D), market, business, and commercialization issues. Concurrent due diligence as a systematic way of assuring market requirements is a proven system of innovation success. It is necessary to recognize that for those that wish to accelerate their products to market, collaboration is a valued initiative and a methodology or system is essential to encourage and provide a pathway to accelerate new innovation development. However, there is still something lacking for a culture of innovation to transcend within an individual or a company. Disruptive innovation must build on emerging market and business needs and produce wealth-creating viable business options.

Disruptive innovation does more than just extend and defend core business. It must build on an emerging business and produce wealth-creating viable business options. Innovative companies must empower technology managers to adopt a business-building approach that connects and integrates technology creation to the target market. This in itself is an innovative business model and system and will require transition in management skills (and sometimes a transition in management itself). To do this requires the elements that form the soul of innovation.

The Soul of Innovation

The soul of innovation is comprised of three components, all of which must be present for an entity to remain successful in today’s innovation economy. This soul of innovation concept applies to an individual as well as to the components of a corporate culture that are necessary to sustain growth and succeed in this highly competitive global environment.

The first essential element is that the concerned entity must have a passion (i.e. emotional involvement and commitment) to innovate. An entity desiring innovation must want to innovate and must recognize all the challenges that go along with the innovation process. By its very nature, innovation crosses new territory and, therefore, is fraught with potential mistakes along the way – hence the rationale for collaboration and a proven system to be used to increase the probability of successful innovation. However, without a passion for wanting to enter this new territory – a passion to innovate – one cannot expect to succeed. For a company, the senior management must instill this passion for change throughout the organization and encourage it through appropriate rewards based on market results from the innovation. This passion for change must be accompanied by a strong desire to make an impact in the marketplace.

Secondly, for any innovation to have an opportunity to be commercializable and profitable requires a source(s) of intellectual property. That is, the conception of new ideas is essential along with a mind that can create them. To properly capitalize on this creative mind, however, a defined system to capture the innovation must be in place. The mind is the source of all IP, of course, but not all minds are trained to inno-
vate. Too often companies discourage innovative thinking with through the infamous “we’ve always done it this way” or “we tried something like that before” syndromes. In innovation economy these companies will not be able to sustain economic viability.

Given a passion or desire to innovate and a well of innovative ideas and processes, the third component of the soul of innovation is the will to drive the innovation process to successful launch. Without this will to innovate the ideas for truly disruptive innovation will remain dormant on the production floor or buried in the research books of a company. A recent ad for a company appeared which indicated that “at the beginning of the day it is all about vision…at the end of the day it is about the courage to execute.” (ad for Mellon Financial). This succinctly summarizes the will to innovate.

Conclusion

Those companies and countries where innovation is encouraged and rewarded will become the economic leaders of tomorrow. This is based on the rationale that the proof of a truly useful innovation is that which beneficially contributes to the entity’s economic well being. By using innovation in a strategic manner and meeting unmet market needs, the innovating entity can shape an industry and dominate a market. When focusing on innovations in areas that are valued by the customer within a given market, one must look to provide market-driven solutions. Because small to medium sized companies often lack a full skill set to effectively launch new innovations and products into the market, collaborative partnerships between multiple companies that address the issues of incorporating technology, market/distribution, manufacturing, and financial requirements are essential to optimize innovation and successfully commercialize the innovation. The role of this collaborative team is to accelerate the commercialization of the innovation and to provide the IP owners with an optimized pathway to economic significance.

Competitive success for technology-based companies increasingly depends on speed to market and speed to profits. To optimize this process requires a system that manages the new product/innovation process from a business and technology viewpoint using appropriate due diligence screening in business, intellectual property, and technology areas. To increase the probability of success, this due diligence process must provide an assurance that the innovation meets market needs.

Understanding the soul of innovation to drive successful innovation, establishing a collaborative process that fills holes in skills or functions of the innovating entity, and developing appropriate systems to accelerate these innovations to market are important because even the best innovative technologies are unprofitable if they cannot be easily commercialized and diffused into new markets. In an innovation economy, competitive success for technology based companies increasingly depends on the ability to launch innovative products/services more quickly. Developing a competitive advantage now requires a business culture of rapid innovation and concurrent change. This managed complexity requires the innovator to understand the concept of leveraging knowledge and innovation by utilizing collaborative approaches to increase the probability for successful innovations. It requires the innovators to develop a system that concurrently protects their intellectual property, develops the necessary infrastructure to ripen and then launch the innovation into the market or process, allows other new, sustainable innovations to emerge, provides management of the innovation portfolio, and creates sustainable revenue growth.