Marriage between Strategic Alliances, Collaboration and Innovation: A Hedonistic View from Biotechnology Industry

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ABSTRACT

This research is a replicative study involving Strategic Alliances, Innovation, collaboration and Biotechnology from a firm level setting with application of evaluation tools like Balanced Scorecard. A conceptual model is referred to in here from relevant academic literatures involving Trust, Alliance Governance (Leadership) Strategic Intent (direction), Organization culture, Knowledge sharing and Internal Business process which enhances alliance satisfaction and increases performance. This performance can be measured by metrics like scorecard and an attempt has been made to do that. This study aims to provide a theoretical background for a broader research theme in the elements
proposed in the conceptual model and paves the way for further examination by application of various qualitative and quantitative measurements.

**Keywords:** Strategic Alliances, Innovation, Biotechnology, Conceptual Model, Balanced Scorecard, Theoretical Background.

**INTRODUCTION**

The knowledge economy has undergone a sea change in modern world with the winds of innovation blowing from all directions had swept away the archaic processes and yielded ways for firms to radically transfer them into focal point for innovation. Firms in the technological arena competing in the new era of knowledge economy had felt the need to access to superior ideas continuously, with access to knowhow and information to be sustainable in the market space (Bierley and Chakrabarti, 1996). As frontiers crumble, no firm can individually access all the information in the marketplace making collaborations essential in the form of alliances with domestic and international firms, government research laboratories and universities (Arora and Gambardella, 1990; Powell et al., 1990). One of the approaches adopted by the firms in knowledge economy is to monitor development of knowledge externally and leveraging it for gainful purposes, is to engage in Strategic Alliances. Strategic Alliances are a quicker source to gain access to superior technology in the form of knowledge repositories patents copyrights etc. Research has corroborated this fact, that alliances are an important source of scientific and technological knowledge (Mowery et al., 1996; Powel et al., 1996; Ahuja, 2000) and contributes to firm success. Empirical research also suggested firms learn from each other
than formal alliances and individual employees also play a big role in diffusing /dissemination of knowledge as suggested by research conducted on localized knowledge spillovers (Saxenian, 1994; Porter, 2000). Also the internet with its far reaching network has facilitated the dissemination of knowledge to a great extent between individuals. Here a discussion is ensued in order to form a routine for guiding future research on individual level collaborations on strategic alliances and the impact it plays on innovation. This individual level of knowledge exchange is of permanent importance in alliance scenario, through contribution made to the knowledge intensive industries like software, research and development laboratories, academia etc. The focus of the individual as a conduit for inter firm knowledge flows is also evident from the work on mobile engineers and innovation in semiconductors (Almeida and Kogut, 1999).

Stages in the formation of Strategic Alliances

In reviewing the literature on developmental stages of Strategic Alliances (Das and Teng, 2002) concluded that all models of strategic alliances contained: A Formation Stage, in which the partners are identified, negotiations are carried out, and the alliance’s strategy is formulated and set up. An Operation Stage, in which the partners start to operate the alliance and implement the agreements. An Outcome Stage, in which the alliance either becomes mature and stabilizes or continues to change and reform.

Primary Purpose of an Alliance:
a) Cooption - In this process potential competitors are converted into allies and providers of complementary goods and services that allow new businesses to develop. The benefits are: I) Potential rivals with complementary skills helps in creating
network economies. II) Firms with complementary goods create network economies in favour of coalition.

B) Co Specialization: It is the synergistic value creation in which partners in an alliance contribute unique and differentiated resources like skills, brands, relationships and create value through bundling of resources.

c) Learning and Internalization: Alliances are a breeding ground for learning new skills which are tacit, embedded and collective, which can be internalized and exploited to yield more value.

**Synergies Generated in Strategic Alliances**

a) Modular Synergies: This happens when companies manage resources independently and pool only the results for greater profits as for e.g. Hewlett Packard and Microsoft have created a non equity alliance that pools the companies' systems integration and enterprise software skills, respectively, to create technology solutions for small and big customers.

b) Sequential Synergies: This occurs when one company completes its tasks and passes on the results to a partner to do its bit. In those cases the resources of the firms are sequentially interdependent. As for instance in a Biotech firm that specializes in discovering new drugs, like Albgenix, wishes to work with a pharmaceutical giant that is more familiar with the FDA processes, such as AstraZeneca, as both companies are seeking sequential synergies.

c) Reciprocal Synergies: This is achieved by closely working together and executing tasks through an iterative knowledge sharing process. In these types of synergies, not only firms have to combine resources, but also have to customize them a great deal to make them reciprocally interdependent. In examining the motives for strategic alliances there is a related study by (Almeida,
Song and Grant (2005) discusses about the superiority of firms vis-à-vis alliances and markets. This paper traces the superiority of MNCs in strategic alliances in facilitating cross border flows of knowledge and the sources of this superiority.

Here the authors examined patent citations in semiconductor companies and found that it points to the superiority of multinational firms over both alliances and markets in cross border knowledge building. The research done by the authors suggest that the challenge of knowledge management for MNCs extends beyond the creation of international information systems, to the design of organizational structures, systems and culture capable of supporting the flow of knowledge. Other studies pertaining to the choice of alliances relates to an interesting insight from the paper by the authors Villalonga and Mcgahan (2005) which investigates how firms choose among acquisitions, alliances and divestitures when they decide to expand or contract their boundaries. Here the authors had examined a sample of 9276 deals completed by 86 members of Fortune 100 companies between 1990 and 2000. Their findings support the explanations based on resources, transaction costs, internalization, asymmetric information and real options and suggest that these theories are related and complementary. The authors found less consistent support for theories based on agency costs and asset indivisibilities. The strong role of firm attributes explains in part why firms may pre specify whether they will pursue acquisitions, alliances, or divestitures as part of their corporate strategies.

Other findings highlighting inter firm knowledge transfer in strategic alliances by (Mowery, Oxley and Silverman 1998) discussed interesting insights dealing with new modes of vehicles of knowledge transfer in alliance dynamics. Here the authors had analyzed partner firm’s ‘overlap’s of technological resources as a
result of alliance participation. The cross citation measure used here was

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\text{Cross Citation Rate (Firm}_i, \text{ Firm}_j) = \frac{\text{Citations to Firm}_j \text{ patents in Firm}_i}{\text{Total Citation in Firm}_j \text{ patents}}
\]

The paper arrived at the conclusion that equity joint venture's appears to be more effective for transfer of complex capabilities than contract based alliances such as licensing agreements. It has been found that significantly, the formation of unilateral contracts are influenced by lower level of agreements.

A similar study conducted by Yves L. Doz in the paper, ‘The Evolution of Cooperation in Strategic Alliances: Initial Conditions or Learning processes?’ discusses learning along several dimensions and provide us with valuable insights. It states how the learning along several dimensions (environment, task, process, skills, goals), that takes place in strategic alliances between firms mediates between the initial conditions and the outcomes of these alliances. Through a longitudinal case study of two projects in one alliance, replicated and extended in another four projects in two alliances, this paper had devised a framework to analyze the evolution of cooperation in strategic alliances. Successful alliance projects were highly evolutionary and went through a sequence of interactive cycles of learning, revaluation and readjustment.

Failing projects, it was found, were highly inertial, with little learning, or divergent learning between cognitive understanding and behavioural adjustment or frustrated expectations. Here it also highlights the critical role played by the middle managers and how they interact with others at other levels, in their own organization and across organizational boundaries, as a key feature of alliance evolution. An interesting study done by the
authors Brian. S. Silverman and Joel A.C. Baum in the paper “Alliance Based Competitive Dynamics” discussed the effects of rivals’ alliances on the competitive pressures experienced by a firm. Linking ecological and economic research on organizations, the authors here propose that the effects of rivals’ horizontal, upstream and downstream alliances are determined by the degree to which these firms a) foreclose a focal firm’s alliance opportunities and 2) increase industry carrying capacity. The authors also hypothesize that firms can co-opt rivals’ alliances by partnering with well linked rivals. An analysis carried out by the authors on Canadian Biotechnology Industry corroborated their predictions regarding biotechnology alliances. In examining alliances closely, it is also worth mentioning the article by Dyer and Singh (2004) where, we are exposed to the relational view of alliances as sources of competitive advantage enhancing the value of parties forging an alliance. This paper talks about specific sources of competitive advantage related to: a) relation specific assets b) knowledge sharing routines c) complementary resources/capabilities d) effective governance.

Conclusions arrived at in this paper by the authors are firstly, pair/network firms can develop relationships that result in a sustained competitive advantage. Secondly, collaborating firms can develop relational rents through relation specific assets/knowledge sharing routines/competitive resource and ‘effective governance’. Thirdly, relational perspectives contradict RBV and dual structure view. Thus here we get a snapshot of the problems and prospects related to relational view and cooperative strategy. Furthermore, other studies made in this context by Khanna, Gulati and Nohria(1998) discusses the tension existing between competition and cooperation and how it affects the dynamics of learning alliances with reference to ‘Private Benefits’ and ‘Common Benefits’. ‘Private Benefits’ and ‘Common Benefits’
differ in the incentives they create for investment in learning. The competitive aspects of alliances are most severe when a firm's ratio of private to common benefits is high. The authors have introduced a measure, 'Relative Scope' of a firm in an alliance, to show that the opportunity set of each firm outside an alliance crucially impacts its behaviour within an alliance. Finally the authors suggest why firms deviate from the theoretically optimal behaviour patterns. The authors also had demonstrated that optimal behaviour patterns differ between unilateral learning and learning in alliances, and this divergence grows more pronounced the greater is the ratio of private to common benefits. Prior research has placed emphasis on how R&D partner selection is impactful to firm and product performance outcomes (Miller, Fern, & Cardinal, 2007; Rothaermel & Deeds, 2004; Shan, Walker, & Kogut, 1994) where greater use of strategic collaborations can yield greater innovation performance (Hoang & Rothaermel, 2005; Kotabe & Swan, 1995). Building on this work, Pleggenkhule-Miles and Khoury (2009) in their paper “How Do Different Strategic Alliances expand a Firm's Technological Breadth? A Study of Joint Patenting within Biotechnology 1980-2007” the authors tried to fill the overlooked void of how R&D collaborations influence an invention’s technological breadth. Focusing on patent strategies, this study aims to further knowledge management research on how R&D collaborations can be leveraged to create more capabilities for the firm (Leonard-Barton, 1992; March, 1991). Given the strategic advantages that come from access to patents with expanded technological breadth, we consider (1) how access to knowledge from different types of R&D partners impacts the resultant technological breadth of a patent, and(2) how prior joint-patenting experience with different partners moderates this relationship. The conclusion arrived at in this paper is joint invention, regardless of type should increase an innovation's
technological breadth is consistent with previous research (i.e. Kotabe & Swan, 1995) that depict alliances as vehicles for knowledge transfer. However, the sub model analysis by the author revealed that not all joint-interactions expand an invention’s technological breadth. Rather, academic collaborations have a distinctively positive influence on a firm’s capabilities, as determined by its technological diversification. In acknowledging that technological diversification typically outweighs a firm’s product diversification (Breschi, Lissoni, & Malerba, 2003), this paper helps complete the story of how different collaboration type can impact a firm’s strategic options to diversify its product offerings. A similar study involving universities, biotech firms and pharmaceutical companies in the paper “Vertical Alliance networks: The case of university–biotechnology pharmaceutical alliance” by Toby. E. Stuart, Salih Zeki Ozdemir, Waverly W. Ding provides valuable insights in vertical alliance networks where young biotechnology firms act as intermediaries in tripartite alliance chains. They (Biotech Firms) enter upstream partnerships with public sector research institutions, and later form commercialization alliances with established, downstream firms. The paper examines the alliance activity in a large sample of biotechnology firms and find: (i) firms with multiple in-licensing agreements are more likely to attract revenue-generating alliances with downstream partners; however, (ii) the positive relationship between in-licenses and downstream alliances attenuates as firms mature, and (iii) the diversity and the quality of the academic connections of firms’ principals influences their chances of successfully acquiring commercialization rights to scientific discoveries in universities.

Trust – Trust plays a critical role in Strategic Alliances. Wicks (2001) argued that trust was a critical facilitator of cooperation and also played a crucial role in the Quality
Management perspective in Strategic Alliances. Ring and Van de Ven defined trust as “an individual’s confidence in the good will of the others in a given group and belief the others will make efforts consistent with the group’s goal” (1994:110).

Strategic Intent (Direction): It is found that firms entering an alliance share common strategic (intent) direction, to gain better understanding of their mutual goals and expectations (Ellram 1990). Lo and Young (2004) pointed out that having a common strategic direction is a requirement for effective supplier integration in strategic alliances. Gulati et al. (1994) pointed to the fact that most strategic alliances involve mixed motive payoff where each partner share both private and common interests. Zollo et al. (2002) pointed out the importance of firm-level characteristics (culture, strategic orientation) on alliance performance.

Organizational Culture - Smith et al. (1995) argued that similarities in the partners’ values fostered the level of cooperation. As values impact the culture of an organization cultural proximity helps in building up an environment of trust and understanding between firms. Organizational culture has been cited as one of the key firm level variables in studying alliance performance (Zollo et al. 2002).

Alliance Governance (Leadership) – In a study of alliances in semiconductor industry, Smith et al. (1995) found that leaders play an important role in trust building within an alliance setting. Inkpen (2005) had cited the role of top management in fostering a climate of learning in an alliance setting which becomes more critical with leaders designated as role models for developing an environment of trust and belief. It was also found that leadership is a key influencer in business performance.

Knowledge Sharing: Enhancement of learning process has been one of the major motives for formation of strategic alliances
(Morrison and Mezenseff, 1997; Inkpen, 2005). Jones and George (1998) indicated that leaning is achieved through sharing of information both intra and inter organizationally. Koka and Prescott 2002 emphasized the role of social capital in the formation of alliances, and defined it as “sum of resources that accrue to a firm by virtue of possessing a durable network of inter-firm relationships.” (2002: 795).

Process Improvement: Practitioners and scholars had emphasized the role of Kaizen or continuous improvement in strategic alliances. A recent study by Lo and Young (2004) of strategic alliances of firms engaged in construction industry, reinforced this view.

Co-operative Learning The term cooperative learning refers to the ability of partners in sharing knowledge, information and resources (Morrison and Mezenseff, 1997) and focuses on cooperation in alliances, rather than competition (Morrison and Mezenseff, 1997)

Performance – To measure the performance we introduce a new tool for performance measurement, the balanced scorecard developed by Robert Kaplan and David Norton (1992). The scorecard measures performance along four dimensions a) Financial b) Internal Business Process c) Customer Metrics d) Learning and Growth. It tries to measure the performance of firms engaged in alliances by mapping the value generated in alliances into different performance metrics.

**The Conceptual Model for Strategic Alliances**

This model for strategic alliance revolves around trust and learning. In a strategic alliance trust directly influences the values, attitudes, moods and feelings of parties (Jones and George, 1998). The closer the culture of the organizations involved in strategic alliance, the greater the level of trust. In their study
with semiconductor firms, Browning et al. (1995) pointed out that cultural difference between firms hindered productive communication among individuals in the alliance. Arino et al. (2001) indicated that familiarity and shared experience were sources of trust, where differences in cultures and institutions had significant impact on trust. They argued that trustworthiness in strategic alliances was deep rooted in the cultural context of the firms within the alliance. Jones and George (1998) argued that shared experience was related to the culture of organizations. However, building trust within strategic alliance is also affected by strategic intent (the motivation for formation of the alliances) which arises from economic considerations (e.g. economies of scale, efficiency, risk sharing), to more complex (e.g. learning new technologies seeking political advantage). Parties involved in a strategic alliance should share common values based on a win-win situation for all. Arino et al. (2001) argued that strategic changes in each party’s goals could affect the level of trust among them. They indicated that changes in strategic objectives posed a great threat to the level of trust among partners. It has been argued that without cooperative learning the success of strategic alliances will be limited in the long term (Morrison and Mezentseff, 1997). Leaders in a strategic alliance promote a conducive environment for knowledge sharing and thus develop trust in the alliance setting. Management style and leadership plays a pivotal role in a successful strategic alliance (Browning et al., 1995). Koka and Prescott (2002) indicated that firms’ commitment dedicated to building relationships enhanced access to information, since partners shared more information with each other. Gulati (1998) argued that trust not only enabled greater exchange of information, it also promoted ease of interaction and a flexible orientation on the part of each partner. Partners share information with confidence because of the development of trust.
Empirical research also supports that development of trust between alliance partners affects knowledge sharing between them (Uzzi, 1996, 1997). Trust can lead to lower transaction cost, which leads to competitive advantage (Dyer, 1996). Empirical studies also show that trust can influence the performance of the alliance (Gulati, 1998). Gulati et al. (2000) argued that strategic alliance promoted trust and reduced transaction cost. Therefore, trust directly affects performance. In the presence of trust, organizations rely on less-detailed contracts which are costly (Gulati, 1995). Alliance satisfaction is defined as one of the outcomes of strategic alliances (Zollo et al., 2002). Such satisfaction enhances overall satisfaction of individual firms in the alliances. It was found that learning within a mutual collaboration and within strategic alliance requires trust and honesty (Crossan and Inkpen, 1995). Learning emerges through the communication and information sharing in strategic alliances (Browning et al., 1995). In that regard, in strategic alliances, knowledge sharing affects cooperative learning. Levinthal and March (1993) argued that strong ties with partners in alliances resulted in exploitative learning. In their study on the nature of social capital in alliances in the steel industry, Koka and Prescott (2002) empirically showed that the nature of information exchange (information volume and information diversity) between firms in strategic alliances was significantly and positively related to firm performance. Inkpen (2005) discussed the role of knowledge sharing in enhancing organizational performance in the auto industry. Morison and Mezentseff (1997) argued that strategic alliances that incorporate shared learning encouraged a foundation of trust and mutual respect, where by developing cooperative learning in strategic alliances; the degree of trust within an alliance was increased. Arino et al (2001) stated that the interactions between partners led to constantly evolving relationships where the tests of loyalty
and fidelity occurred periodically. Koka and Prescott (2002) further argued that a firm’s history and experience with partners resulted in exchanging information that was rich with value and context because of increased opportunities for learning-by-doing, which leveraged trust. Jones and George (1998) argued that interaction among members and organizations generated knowledge and learning, which was a form of tacit knowledge. Accordingly, cooperative learning affects the level of trust among partners. Arino et al. (2001) stated that the level of trust among alliance members increased as they engaged in the process of mutual adjustment which is defined as the degree of responsiveness of each partner in different circumstances in their alliance, which in turn, stresses the need for cooperative learning. Any change in the learning process directly affects trust in an alliance partnership. Zollo et al. (2002) argued that knowledge gained thorough collaborative work between partners helped them develop a refined understanding of each other’s culture, management style, capabilities, and weaknesses thereby affecting level of trust. Firms in the alliance attempt to systematically diffuse knowledge throughout their organization (Hamel et al., 1989). Crossan and Inkpen (1995) argued that learning was directly linked to the ability of the firms to develop a sustainable competitive advantage. In that regard, learning positively affects the performance of firms. Garvin (1993) argued that continuous improvement required a commitment to learning. Knowledge acquired within an alliance is valuable after it has been diffused through the organization (Hamel et al., 1989). Accordingly, learning should enhance continuous improvement of processes in firms within the alliance. Continuous improvement is defined as the ability of the firm to continuously develop its processes (Dean and Bowen, 1994). Research stands testimony to the fact, that process improvements affect firm performance (Wilson and
Collier, 2000). Gulati et al. (2000) argued that both exogenous and endogenous variables could explain how strategic alliances and networks evolved over time. In the model the environmental variables (culture, strategic intent etc) are exogenous variables impacting an alliance partnership. Madhavan et al. (1998) indicated that environmental variable should be regarded as exogenous variables. It has been indicated that both top managers and network/institutional perspectives were important for understanding patterns in the adoption of innovations among organizations (Young et al., 2001). While the role of the top manager has been recognized as one of the key variables in the model, the network effect has been considered as well, where its effect on building trust is unquestioned.

BIOTECHNOLOGY INDUSTRY: AN INTRODUCTION

This is a rapidly growing industry marked by continuous change in the industrial and scientific domain. Compared to other pharmaceutical companies biotech companies possess core competencies in the area of molecular biology which helped them foray into uncharted areas of research. Thus there are an ever increasing number of “locks and keys” particularly for pharmaceutical research and drug development and very few firms can develop mastery on all of them (Ameida, Hohberger and Parada, 2008). In this rapidly evolving industry the sources of knowledge are garnered from a variety of fields, namely research laboratories, specialized biotechnology firms and prominent government institutions across the globe (Arora and Cambardella, 1990; Powel et al., 1996). Success here is defined as having expertise over basic science domain and harnessing emerging technologies to test, develop and commercialize scientific ideas.
Rothaermal and Hess (2007) discussed about the interaction between industry/firm /individual level factors for generating innovative research output. As number of collaborations entered into by firms increase, there is a greater chance of having access to a vast body of untapped knowledge, ready to be tapped, acting as a launching pad for future development in this sector. These collaborations enhance innovation capabilities following the growth cycle, monitor the progress of innovation capabilities and contribute to the growing body of academic literature in the scientific domain.

Problems and prospects in Biotechnology sector: A Snapshot View

An alliance results in a long-term partnership between two or more partners, involving resources (tangible and intangible) in a bid to gain superior advantage in the domain space the companies are operating and represent mostly, all the major industries. Biotechnology industries thrive on research productivity and are an indispensable source of sophisticated research capability. It is this symbiotic relationship, that fuels an increasing number of alliances with current trend, focussing on establishing alliances with companies interested on exploiting the entrepreneurial skills. Entering an alliance reduces ancillary costs like selling and distribution for companies and enhances presence in the market through increased penetration. A healthy alliance thus, eventually reaps huge benefits, for both pharmaceutical and biotechnology companies in the market.

In recent past, most licenses for products in biotech and pharmaceutical domain involved mid-to-late-stage products which reduced the risk of failures considerably in the market place. However, it was found that early-stage alliances had a higher chance of failures and not very successful with companies entering into an alliance relationship. Another downside for early stage
products is the response time/turnaround time, which is considerably slower and breeds uncertainty, making the smaller companies an unviable option. In addition, these companies require domain specific skills which can only come by through efficient management. Thus, companies in this area should focus on timing of forming an alliance partnership to be successful. Another viable option to gain cheaper access to molecules is through collaboration and stay abreast in marketplace.

Pharmaceutical and biotech companies are now facing a challenge sourcing and selecting the right partner and emergence of biopharmaceutical companies complicates the market scenario and increases pressure on the pharmaceutical companies, who thus starts seeking alliances with biotech companies. Integrating small companies with niche products with larger pharmaceutical companies becomes a challenge and henceforth companies prefer partners with similar skill sets and culture as for example an emerging company in the biotech super specialty domain. Alliance managers enjoy higher bargaining power in the deals in pharmaceutical mergers by virtue of their financing capabilities.

However, the increasing trend is that the biotech companies are gaining more power by virtue of their market position and this depends largely on the negotiation skills of pharmaceutical companies. Research has shown, approximately half of all alliances does not perform up to expectations because of intellectual property disputes along with cultural problems. Funding for small and niche biotech companies is sparse because of its inherent complexities and have close ties with in-house developments. Effective alliance management thus involves sufficient funding and foster innovative culture and openness.

Larger biotech companies grow organically by harnessing resources and thereby needs an alliance coordinator to ensure sustainability. Alliance performance can be manipulated, using
specific actions through an open environment of trust and commitment. Well researched objectives, smooth process flow and suitably channelized communication will help nurturing success alliances. A learning environment coupled with proactive alliance sourcing and management will breed success by involving proper governance network. An increasing challenge for companies in this domain is matching the sophistication of biotech companies in terms of knowledge and learning to match up with the new generation firms and creation of suitable market opportunities. In short, pharmaceutical companies need to exploit these vast pool of learning and knowledge available through collaborative settings by charting out an optimal plan for survival and to leverage the market opportunities in their favour (outlines adapted from www.frost.com). Complexity in process or product influences the decision to partnering or to go alone in case of companies. Biotech firms such as Biocon, Amgen, and UCB are characterised by a combination of simple and complex processes and are faced with the question of time factor for framing an alliance in the prevailing scenario, and the need for focussing on processes for efficient utilization of the scarce resources. There is no one single answer to these issues in the paper by ‘Esteve Almirall and Ramon Casadesus-Masanell in the Academy of Management Review’. Complexity in biotech firm both in terms of process/product leads to a number of trade-offs in relation to the decision to partner an alliance. Only complex processes generates value through Research and Development for Biotech firms and are most sought after in strategic alliances and thus the firms need to take a strategic decision, as to the appropriate situation for partnering a deal. This involves taking a clear view of the processes and elaborately defining the functions and objectives. Improvement in business functions like process improvement/cycle time reduction helps reducing the complexity
of a process. Subsequently the firms can decide whether to collaborate or not. The right level of complexity to benefit from an alliance is the mid–low category where all the partner’s act complementarily with each other in this setting efficiently to arrive at a consensual decision among its partners and thus, utilizing resources in an optimum fashion.

**INDIVIDUAL COLLABORATIONS: HOW DOES IT INFLUENCE ALLIANCE SETTING IN BIOTECHNOLOGY/PHARMACEUTICAL INDUSTRY?**

It is generally believed, that strategic alliances and individual collaboration enhance innovation and learning significantly in an alliance setting. Two schools of thought exist on this issue. In Biotech industry evidence points to an alternative method of knowledge acquisition through communities of practise to which scientists are affiliated (Liebeskind et al., 1996). It is seen scientists in this sector often collaborate with peers in other firms, universities and research institutions transcending all geographic and firm boundaries and act as an excellent knowledge repository. Research also points to the fact that collaboration enhances the productivity of a scientist’s research (Cockburn and Henderson, 1998). Restrictions also exist in terms of managerial and financial resources for small biotechnology firms as the sources of knowledge are vast and hitherto scattered. Evidences point out that on an average each biotech firm formed eight alliances (Rothaermal and Deeds, 2004). Furthermore, knowledge networking among scientist’s of individual firms could help the firm booster its innovation and get a distinct advantage among the peer firms in the market. According to (Rosenkopf and Almeid, 2003) firms hire pioneers in research domain, to fill in their
research portfolio and enhance competitiveness. There exists two alternative forms of knowledge acquisition, one through following systems, processes and norms like strategic alliances (formal collaboration) and the other through networks of scientists working in different research centres (informal collaborations) and pooling in scientific knowledge from a host of resources. One of the most challenging things is to avoid falling into competency traps by companies while commanding superior knowledge and skills over a specific domain of innovation by making a conscious choice of adopting one and neglecting the other. (Levinthal and March, 1993). It is also believed that informal networking among individual scientists paves the way for formation of exploitation of formal strategic alliances and vice versa (Stuart et al., 2007).

**BALANCED SCORECARD: A NEW TOOL ENHANCE STRATEGY AND A NEW MEASURE OF APPRAISAL**

The Balanced Scorecard (Kaplan and Norton, 1992) is a new measure of performance and has been derived from strategy of the organization. It can be used as a future predictor of performance (both financial and nonfinancial), which encompasses the four quadrants of a scorecard i.e. financial, internal business process, external process and learning and growth. It has a wide gamut of uses for communicating strategy in the organization, identifying and aligning strategic initiatives, reviewing strategy systems as well as generating feedback to improve upon the existing one.

The Balanced Scorecard relies on four measurement metrics to translate the short objectives /activities into long term drivers of success:
a) Translating the Vision: The scorecard forces the managers to translate their lofty vision into tangible operational objectives. For translating these lofty ideals into operational measures managers should come to a consensus regarding identification of stakeholders and their requirements.

b) Communicating and Linking: This process involves communicating the high level objectives into suitable performance measures appropriate to each business group to yield a “personal scorecard”. Thus it helps the individual productivity affects the organization’s strategy and helps to create an alignment of individual to organizational objectives (goal congruence).

c) Business Planning: Balanced Scorecard forces managers to integrate financial budgets to support strategic objectives and helps in identifying the most important “drivers” for the desired outcomes.

d) Learning and Feedback: The Balanced Scorecard provides valuable feedback about technologies, processes, innovations and keeps the managers updated about the proper implementation of strategy and refining them according to the company’s needs. It is in short a feedback tool to find out whether a company has proper strategic systems in place and the effectiveness with which they are utilized to meet the company’s vision.

Appraisal of Biotechnology Firms using Scorecard metrics:

Having discussed about alliances and its implications on Biotechnology firms, a pertinent question which strike our minds is how to measure the effectiveness of Biotechnology firms, pre and post alliance. For this purpose we have adhered to a long standing tool, the Balanced Scorecard devised by Kaplan and Norton (1992) of the Harvard Business School to successfully evaluate firms engaged in research and collaboration.

a) Balanced Scorecard: Performance Dimensions:
The Four Metrics of Scorecard are as follows: Financial Metrics which measures the economic consequences of actions already taken in terms of EVA (Economic Value Added). EVA can be considered as a good measure of financial performance. It EVA is the excess of returns (ROI- Return on Investment over Cost of Capital). In a Biotechnology Firm the cost of capital is the funds procured through debt capital (mainly loans). Customer Metrics defines the market position of the firm/organization and the perception it enjoy from the stakeholder point of view. It includes several generic measures of successful outcomes from a well formulated and dexterously implemented strategy. In a biotech firm this includes customer satisfaction new product launch etc.

Internal Business Metrics deals with the organizational excellence achieved by the company particularly through process improvement, reduction of cycle time and by achieving a cost leadership thus giving it a sustainable competitive advantage. In a Biotech company this typically would be introduction of new generic drugs, capturing new generic markets for drugs and increased customer satisfaction.

Learning and Growth metric depicts the innovation/knowledge creation within the company. This can be done through patent development, successful clinical trials and knowledge management through ongoing research and innovation.

CONCLUSION

This paper discusses the important role played by individual collaborations and strategic alliances in biotechnology domain and its impact on the innovation processes. We suggest practitioners and academicians must move beyond alliances while harnessing
the power of knowledge in acquisitions through various collaborative avenues. Distinctive capabilities are needed for organizations seeking knowledge transfer through individual collaborations. We predict based on the experiences that firms might develop new capabilities to deal with both types of collaborative activities (individual and joint) in order to be successful.

Table 3. Balanced Scorecard Implementation in Biotechnology – An Example

<table>
<thead>
<tr>
<th>Financial</th>
<th>Internal Business Process</th>
<th>Customer</th>
<th>Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth (% increase in top line revenues)</td>
<td>Reductions in Inventory (Inventory Turnover Rate)</td>
<td>New Products (Percent of Sales from New Products)</td>
<td>New active ingredients (Number of new ingredients identified through a discovery program)</td>
</tr>
<tr>
<td>Profitability (Return on Equity/EPS)</td>
<td>New Products (No of introductions Vs Target)</td>
<td>Customer Satisfaction (Customer Satisfaction Surveys)</td>
<td>Proprietary Position (Number of patents that create exclusive marketing rights)</td>
</tr>
<tr>
<td>EVA (NOPAT - Cost of Capital) NOPAT= Net Operating Profit After Tax.</td>
<td>Cost Leadership (Low Cost producer to give a sustainable competitive advantage)</td>
<td>Product Quality (Product Performance Vs Standards)</td>
<td>Early Payment a.k.a Debtors Turnover (% of Customers. pay early)</td>
</tr>
</tbody>
</table>

1 Source: Applying the Balanced Scorecard to Small Companies by Cheen.W.Chow, Kamal. M. Haddad, and James E. Williamson - Management Accounting, August 1997.
Moreover, this paper proposes a new conceptual model of measurement by using Balanced Scorecard (BSc) as a performance measurement tool in strategic alliances in association with different elements (Trust, Alliance Governance, Culture, Strategic Intent etc) and their impact on performance which may act as a benchmark for future research. One point worthy of mentioning here is, the research undertaken here is at an embryonic stage but provides a clear direction for rigorous research process in future.

LIMITATIONS OF THE STUDY

The concepts and ideas discussed here may further connect well with chances of better development of arguments. This is an initial direction/approach to build on a research line and thus may be looked upon as an exploratory study. It might appear that there is a lack of focus but the key here is to focus on less issues (for e.g performance) and working closely with that by taking up a focussed study.

Future Research

The conceptual framework discussed in this study discusses two outcomes for a strategic alliance: performance and customer (alliance) satisfaction. While performance encompasses the overall performance of the alliance, customer satisfaction is related to each individual firm, to the extent that each firm is satisfied with the alliance. Empirical research is needed to determine the applicability of the proposed framework. Identifying tools, techniques and procedures for developing practical tools for trust development, generating knowledge, enhancing organizational learning, and continuous process improvement (kaizen) in
strategic alliances could be considered as future research within strategic alliances. Also we feel each of the elements in a Balanced Scorecard used for measurement of alliance performance can itself provide a self sustaining research direction and can be investigated further (as for e.g. the role of EVA as a financial tool in measuring the affectivity of alliances can be pursued).

REFERENCES


Miles-Pleggenkuhle.G.Erin and Khoury.A.Theodore, How Do Different Strategic Alliances Expand A Firm’s


