

# **The effect of business transformation and innovation economics on sustainable corporate competitive advantage**

William P. Creamer  
Strayer University

Pesi Amaria  
Management Consultants

## **ABSTRACT**

This study examined the sustainable competitive advantage for domestic, international, and global corporate entities gained from the use of business transformational and innovation economics. Additionally, this study determined the importance and influence of business factors that trigger growth and innovation for sustainable competitive advantage. A mixed-method approach was employed to examine the experiences of business leaders, thought leaders, and C-level executives regarding the impact of transformational factors, such as the open model for collaboration, shortened product lifecycles, and innovation economics on successful growth and innovation for sustainable competitive advantage. In summary, this study researched, tested and analyzed the significance of the above statements and the associated hypotheses were framed from the study's Research Question.

Keywords: Business transformation, innovation economics, sustainable competitive advantage (SCA), global marketplace, open collaboration, product lifecycles

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## INTRODUCTION

Successful business leaders and C-level corporate executives (CEOs, Presidents, COOs, CMOs, CTOs, CFOs, etc.) across a wide gamut of industries face the challenge of facilitating corporate innovation and growth while ensuring the efficient allocation of scarce resources. This delicate balancing act has become a focal point in modern business, where the realities of the old adage “innovate or die” are hammered home by the current fragility of the global economy. Where innovation is concerned, the issue has never been the lack of great ideas; rather, the real management challenge often lies in the process of direct application, implementation, and rapid commercialization (Govindarajan & Trimble, 2005).

John Chambers, president and founder of Cisco Systems and perhaps one of the most influential business thought leaders of modern times, stated recently that corporate America’s future hinges on its ability to practice, harness, and switch from traditional business operating models to those that feature more open collaboration and development (McGregor, 2009). Chambers argued that open innovation offers the best platform for leveraging organizational science, knowledge, and experiential learning to foster rapid creative development, implementation, and new business leadership. Similarly, Jeffery Immelt, General Electric (GE)’s CEO and thought leader, characterized today’s economic landscape as a new frontier that offers the opportunity for continued corporate change (McGregor, 2009). Both Chambers and Immelt firmly believe that business transformation will continue to be the universal challenge, constraint, and constant for businesses leading into the future, i.e., innovate or die.

The challenge to management often begins with the undertaking of a new breakthrough idea that transforms the company’s core values to reflect new core competencies (representative of this new breakthrough concept) and a new value proposition (Chesbrough, 2003; 2006; 2007). Govindarajan and Trimble (2005), Chesbrough (2006), and Palimisano (2006) discuss that the organization’s perilous struggle to accomplish a successful transformation involves more than raising new funds and sources of capital. The struggle often entails attracting and enlisting key support within the organization for a new voyage into an uncertain and somewhat confusing high risk environment. Consequently, the captain of this “vessel” must reform and enlist his/her crew while facing strong competitive “turbulence” and persistent “gale-force winds.” The journey’s successful navigation, often a test of leadership, is further challenged by the necessity to leverage and align the full faith, support, and commitment of all valued stakeholders. This daunting task comprises what some authors have described as the primary challenge to accomplishing the “third order change” or Level Three Change necessary for business transformation (Govindarajan & Trimble, 2005; Chesbrough, 2006; Palimisano, 2006).

The topic of sustainable corporate growth through continued innovation is viewed by many business experts as a critical success factor. However, many of these experts have cited concerns in meeting and satisfying the demanding resource requirements of long term growth and short term shareholder demands. Employing the traditional merger and acquisition strategy has often realized less than optimum results (Christensen & Roth, 2004; Charan & Lafley, 2008). The precursors for a corporation’s continued growth and performance (as witnessed by the value of a company’s stock compared to those of its peers) are established through a myriad of diverse yet linked strategies that together make up the foundation of that company’s operations and growth initiatives. Of these precursors, a company’s plan for organic (internally driven) growth derived from a successful rapid innovation process of concept generation, innovation, development, implementation, and commercialization, shows clear linkages to measures of that

company's value in the marketplace. Significant empirical research and a variety of case examples point to the additional market premium or value embodied in the corporate per share stock price gained from implementing a business transformation process based on organic growth (Carlson & Wilmot, 2006; Charan & Lafley, 2008; Chesbrough, 2007, 2006; Christensen & Roth, 2004; Jonash & Sommerlatte, 2000).

Richard Ottoo's (1998) research focused on the key factors that form a strong capital structure that contribute to sustainable corporate growth opportunities. The major premise of his research can be stated as, "real growth options are not endowed on companies but are instead acquired through competitive investments" (Ottoo, 1998, p. iv). He further stated that strategic corporate investments in research and development assets across the company often result in productive technologies, which in turn enable rapid patent growth and protection to guarantee indefinite flows of monopoly rents. Ottoo's research supports the premise that a corporate entity's future performance is directly tied to and positively correlated with the strategic (i.e., long-term) application of the following growth factors: (1) R&D outlays of the firm and its rivals, (2) expected manufacturing capital, (3) cost of hedging the entity's volatility, (4) low cost of interest (availability of and access to credit), (5) expected monopoly rents, (6) conditional probability of innovation, (7) correlation between capital investments and R&D project value, and (8) advertising spending.

Another significant participant and contributor to the spectrum of innovation research was Joseph A. Schumpeter, whose early works (in the 1930s) featured the concept of creative destruction, or continual renewal. Schumpeter's theory has been described in terms of the "perennial gale of creative destruction" (Schumpeter, 1975 in Foster & Kaplan, 2001). This study considered many works from a rich body of evidence in an effort to derive, identify, and determine the reoccurring factors, trends, and predictors related to successful innovation, growth and sustainability.

The research problem explored and resolved in this study identified the paramount growth factors and characteristics shown to be positively linked with continuous (versus discrete) innovation and growth, as applied to business transformation and innovation economics.

Accordingly, the objective and purpose satisfied by this study was to identify significant growth factors driving and supporting successful growth and innovation.

## **PURPOSE OF THE STUDY**

This study focused primarily on the identification of, and impact generated by, the growth factors necessary for sustainable corporate performance. In particular, this research addresses the impact of innovation and the primary growth factors for successful and sustainable competitive advantage.

## **RESEARCH QUESTION**

What are the factors of business transformation and innovation economics required by domestic, international, and global corporate entities, to achieve sustainable competitive advantage?

## LIMITATIONS OF THE STUDY

This study provides relevant and current day findings from the collective body of research available in scholarly journals and contemporary field work from the nation's leaders in business practice management and assessment. The research includes (but will not be limited to) the following: (1) characteristics of innovation and change in an organization, (2) innovation theories and best practices, (3) application of innovative processes and theories to individuals and organizations, (4) survey findings from practice leaders in the field, (5) findings from professional surveys conducted by this study, and (6) principles and practices for implementing innovation and continuous change.

### Anticipated Significance of the Study

The significance of this study contribution can be seen in its expansive research, investigation, analysis, and determination of the key findings that support the hypotheses that form the foundation of the accompanying research.

This study investigated and identified key benchmark parameters, growth factors, variables, and practices supporting successful corporate innovation, growth, and performance. Where this study departs from earlier works will be in the deep content, research and analysis across all sectors referenced (manufacturing, service, high technology, and retail) in support of the hypotheses.

## LITERATURE REVIEW

The literature review discusses the following areas: (1) characteristics of innovation and growth, (2) innovation economics (IE) and level three transformation, (3) open model for collaboration and innovation, (4) continuous innovation using the open model and IE, and (5) organizational structure for shortened product lifecycles.

### Characteristics of Innovation and Growth

Measuring a firm's innovativeness or propensity to innovate remains an important, albeit murky, science. This "ability to innovate" has often eluded the understanding of most companies and scholars, while rising to top of the mind for many of business thought leaders. Carayannis and Provan (2008) described the ability to innovate as consisting of three vital factors: (1) propensity, (2) performance, and (3) posture.

Carayannis and Provan (2008) constructed an index of performance similar in nature to Kaplan and Norton's (1993) balanced scoreboard and Altman's (1968; 2000) famed financial constructs used in measuring and forecasting continued growth. Carayannis and Provan concluded that most of the literature and associated research tends to focus on a *linear input through output process* in manufacturing and ignores the impact of the multiple variable concepts. The tendency among researchers, according to the authors, is to derive a composite index that is often incomplete. To support this point Carayannis and Provan identified a more complete set of requirements and measures of innovation that cover a wide range of innovation performance. These measures or growth factors are: (1) alignment, (2) training and orientation, (3) sales share of R&D expenditures, (4) sales share of internal venture capital, (5) various

process-oriented measures, and (6) newness of innovation, new to the firm, new to the industry, sales derived from innovation, number of patents, and profits.

Carayannis and Provan's work delivered a fundamental observation of the ways in which the input variables of financial resources and human capital can impact performance, when coupled with processes and alignment and focused on the value proposition of sustainability through innovation. They contended that "...simultaneous inclusion of multiple variables, when integrated into the corporate culture, produce the best results. This approach differs from prior single variable cause and effect analysis" (Carayannis & Provan, 2008). This observation is consistent with the claims of other scholars cited in this study.

Skarzynski and Gibson's (2008) research over the past ten years has found that most companies are increasingly less than satisfied with the results derived from their R&D expenditures. Skarzynski and Gibson research pointed to numerous studies and surveys in which despite significantly increased resource investments into R&D, the results fall short. Real wealth comes from a radical departure from the past and can best be achieved through a well-designed innovation strategy and execution plan. This process requires multi-year investments, new business model transformation, and real senior management commitment. (Skarzynski & Gibson, 2008)

Goulden's (2006) research on the sources of corporate growth consisted of interviews with subjects from around the world on the topic of a "flattening" society (based on the Thomas Friedman work). Goulden produced the following summary of new competitive rules for successful growth in the 21<sup>st</sup> century: (1) knowing why is better than knowing how, (2) extreme collaboration drives extreme performance, and (3) change is the only constant. (Goulden, 2006)

Goulden's work can be summarized as, "The Flat business is focused, fast and flexible....scale is no longer a critical issue of constraint" (Goulden 2006). This transition or change in corporate dynamics has significant consequences. According to Goulden, the new business model for the flat business will require a complete realignment. This re-alignment will depart from the traditional networks and will perhaps be built around specific applications, such as uniquely dynamic databases or e-mail servers, to a service-oriented IT structure. Goulden viewed business transformation as originating in the unlocking of data stored in "information silos," and the movement to a more open system in which information is shared in open knowledge platforms across the entire organization, and beyond.

The process described above supports the case for building and maintaining partnering networks, and for continual open collaboration as a foundational block for sustainable growth and innovation. Innovation and growth have roots in the formal and informal structures of modern society. For example, open source software has enabled user communities to promulgate products and services alike. Creating complex products with limited direct involvement from main line manufacturers has become a new frontier (von Hippel, 2001). According to research (Pralhad & Ramaswamy, 2003; von Hippel, 2001), given the right conditions these communities seem to thrive on value creation.

Pralhad and Ramaswamy (2003) stated that "the emerging competitive landscape and converging technologies are causing traditional industry boundaries to shift and blur". This market blurring makes the segmentation of serving and supplying communities less than traditional in nature. Pralhad and Ramaswamy provided numerous case examples, including the communications device industry (composed of phones and pagers), the software business, and the movie and music industries. They identified the following as growth factors or accelerators for continued industry transformation: (1) co-creation with users and customers, (2) value

creation from the consumer's point of view (Drucker's viewpoint), and (3) the "experience space" in which the perspective and focus are on the customer, not the product.

The concepts described in Prahalad and Ramaswamy's (2003) research can be found today in several emerging areas of consumer based research. Consider clothing and/or medical devices using nano-technology, facilitating the development of pacemakers that adjust remotely. In addition, consider the road side assistance service offered by auto manufacturers. Prahalad and Ramaswamy cited these examples to prove the futility of trying to control the end user experience in the aggregate. They indicate that users all have different make ups, behaviors and interest that cannot be distinguished by aggregate analysis (Prahalad & Ramaswamy, 2003). These findings support the concept of designing to the consumer experience; the authors argued that it would be "...more efficient to design into the co-creation experience of the user and react to the activity and experience in producing the desired outcome" (p.13-14). Prahalad and Ramaswamy documented case examples of companies that partnered to provide new consumer learning experiences that entertain while creating the environment for innovative experience and visualization.

### **Innovation Economics (IE) and Level Three Transformation**

Innovation Economics (IE) as defined in this study represents the continuous ability to redeploy resources for continuous growth, using portfolio analysis methodologies, i.e., a program of deliberate and continuous review of all products consisting of screening, evaluation, investigation, experimentation, and planning (Barnett, Musso, & Padhi, 2009). The process ensures efficient and effective resources to assets capable of producing long term returns to factor inputs. IE often integrates a process of open collaboration and experimentation coupled with a continuous process of analysis, investigation and refinement. The concept is based on the simple outcome principal-pricing power gained through successful innovation. Innovation is often considered a differentiator and an effective attractor for value-based customer (Moore, 2005). This concept is not new in theory but often scarce in practice. Many companies, thought leaders, and authors cited in this study overwhelming support the concept in theory and practice for long term sustainable growth and profit.

IE's less than wide spread application and acceptance is often attributed to the lack of: (1) a strategic core innovation focus- insuring: enterprise accountability, acceptance, measurement and adoption, (2) senior management sponsorship, (3) practice champions, and (4) a trust and reward system highly supportive of IE. IE and the companies that practice and employ its methodology have experienced sustainable marketplace value and profit margins (MacCorack, Forbath, Brooks, & Kalaher, 2007). These objectives are an outgrowth of IE's ability to achieve increasing returns gained from continuous successful innovation.

Research from Chesbrough and Appleyard (2007) contrasted the open innovation model with the traditional business strategy of defensible positioning through the use of barriers to entry and value chain power (Porter, 1998a; 1998b). Their research found that many firms were migrating through experimentation to new forms of the open innovation model. Chesbrough and Appleyard's research is perhaps one of the most thought-provoking and insightful series of papers and research on the history and derivation of sustainable innovation and the emerging new development of innovation economics for open innovation. The authors traced the historical landscape of strategic development from the early works of Chandler's strategy and structure to

Porter's Five Forces, from a producer surplus model to the current focus on maximization from the producer's standpoint.

Chesbrough and Appleyard defined openness as the sharing and pooling of knowledge leading to public good (education, government, and welfare economics). Chesbrough and Appleyard posit the formation of "new-to-world concepts", and "open to all users benefits all". The benefits are contributions from the user communities can often enhance the products/services, and expansion of the user groups can accordingly facilitate further and more rapid development at an exponential rate. This cycle of the continuous flow of resources as Chesbrough and Appleyard explains is capable of producing sustainable innovation according to the following model: (1) more users attract more users and value contributors and (2) a self-generating cascading process originates from ideas – products – services – value creation - value capture.

The open model relies on the creativity of the members and network partners to spot future opportunities, identify trends, and develop new business models to capture value. The research suggests that an open strategy is the ultimate determiner of sustainability and open innovation. Open strategy refers to the creation of a new business model (Level Three Transformation) necessary to support rapid critical mass and band power (Charan & Lafley, 2008). According to Charan and Lafley, the real barrier lies in the creation of a new business model based on open innovation and collaboration that fosters continuous innovation tied to value creation and capture.

Dooley and O'Sullivan (2001) and others (Charan & Lafley, 2008; Prahalad & Ramaswamy, 2003) embraced the concept of survival as linked to the "learning entity". They viewed an organization's ability to successfully and continually manage the process of adaptation, change, and innovation as a core competency. Their research centered on the premise that change is continual and necessary for sustainable growth. Dooley and O'Sullivan cited an extremely high failure rate for new technology, despite management's continued pressure to "get it right." From their research, the failure of change management can be directly attributed to the absence or poor level of following growth factors: 1) leadership unable to align goals and actions, (2) involving employees in generating ideas and problem solving, (3) ineffective action implementation, (4) lack of management and monitoring of overall process, (5) lack of leadership direction of the innovation process, and (6) key processes integration.

Barsh, Capozzi, and Davidson (2008) found that executives are generally disappointed in their ability to stimulate innovation (The McKinsey Quarterly Global Survey, October 2007). The gap between the leader's aspirations for and execution in sustaining innovation to create real value is extremely difficult to overcome.

However, Barsh, Capozzi, and Davidson further noted that "more than seventy percent of executives say innovation will be at least one of the top three drivers of growth for their companies in the next three to five years" (cited in The McKinsey Quarterly Global Survey, October 2007, pp.1-13). Barsh, Capozzi, and Davidson contend that organic innovation provides a marketplace premium (price per share) and an extremely important competitive advantage for companies to accelerate the pace of growth in today's global business environment. Investors are quick to understand the impact and competitive advantage gained through sustainable, albeit hard to obtain, generic growth. In their findings, Barsh, Capozzi, and Davidson cited the following concepts are paramount: (1) integrated innovation, (2) open collaboration, and (3) trust bridge.

Barnett, Musso, and Padhi (2009) noted in their study that in difficult economic times the normal temptation is to cut back on R&D expenses. While many companies have followed this process, the authors advocated a more deliberate and continuous program of scrutiny, planning, and providing for continual growth, to include a complete review of all products. This process should be a best practice procedure that facilitates the reallocation of resources to the most significant research projects directly related to the organization's long-term growth. The focus, they contended, should be on upgrading R&D, and accelerate the most promising strategic opportunities. Cost cutting often has the reverse effect: companies that practice "cost cuts across the board" often eliminate some of the most promising opportunities for the long run in favor of those immediate short term value (Barnett, Musso, & Padhi, 2009).

Christensen, Johnson, and Rigby (2002) provided an executive blueprint for accomplishing the concept of disruptive innovation, which they described as significant level three change allowing companies to enter new markets and introduce new products. According to the authors, this process is best attempted during good times: their research indicated that gaining the support of the investor community for such transformation during economic downturns is a difficult task, at best. Accordingly, as product markets mature during growth periods it is appropriate to plan the next level of transformation. Christensen, Johnson, and Rigby's research into the field of innovation science spans more than a decade, and covered why some efforts succeed and others fail. Their research included investigation into historical cases as well as the tracking of initiatives in real time. They found that disruptive innovation almost always comes from non-incumbents. Incumbents focus on extending the current customers revenue stream, rather than seeking new models for creative disruption. Christensen, Johnson, and Rigby explained their argument in terms of innovation economics as follows:

1. Disruptive innovations appear to be unattractive to the incumbents.
2. Disruptive innovations often involve simple adaptations derived from known technologies.
3. New entrants often beat incumbents in the race for disruptive innovations, due to motivation and will to win.
4. Large companies often have very high investment thresholds for new launch and development. These internal metrics can often result in limited or constrained decision making. Resource priority is often driven by large numbers (Christensen, Johnson & Rigby, 2002).

Meaney and Pung (2008) surveyed 3,199 C-level respondents on the importance of and need for organizational transformation. Respondents indicated the value of alignment, organizational aspirations as reflected in clear objectives, engagement and commitment from the entire enterprise, and high involvement by the CEO.

### **Open Model for Collaboration and Innovation**

To demonstrate its commitment to open innovation, IBM donated over 500 of its software patents to the open source community (Chesbrough, 2007). IBM's intent was to spur creative and collective innovation capital and deepen the platform for collaborative development. This goal appears to be a growing development among other major industry leaders, for example



Sun Microsystems, Nokia Corp, P&G, and Air Products and Chemicals, to name a few (Chesbrough, 2007; Chesbrough & Appleyard, 2007).

According to Charan and Lafley (2008), the consumer is the central focus of all the efforts of any given company. This focus, according to the authors, opens the company to the process of open collaboration with vendors, suppliers, and customers. The authors cite examples of new business model and its associated strategy, known as “Connect and Develop” and making sustainable organic growth the priority (p. 5). Charan and Lafley stated that to get organic growth a company needed to innovate and become a more consistent and reliable innovator, and to create an organization of sustainable innovation. (p. 6). The authors’ research found the major business imperatives for customer-centric innovation to be:

1. Innovation established as a core strategy, one the entire enterprise would be structured around
2. Measurement, continual measurement of the innovation process, commitment, and progress
3. Integrated buy-in across all levels of the entire organization
4. Evaluation, recognition and advancement tied to innovation goal accomplishment
5. Resource commitment, continued support (Charan & Lafley, 2008).

Charan and Lafley (2008) posited that running a company according to the above-listed imperatives would produce a disciplined approach to innovation that would be free from the fear of failure, doubt, and uncertainty that often overshadows such a journey. This strategic positioning can produce a collective will to pursue customer-focused innovation, while at the same time instilling uniformity across the entire enterprise. The “not invented here” syndrome would no longer dominate the company’s thinking, leading to a reversal of the close-mindedness often found in many other companies.

Barsh, Capozzi, and Davidson (2008) provided substantial research (developed through numerous surveys of executives) that raised the view of leadership as the best predictor of innovation performance. In a survey of 600 global executives, managers and professionals, the respondents drew the following correlations:

1. Leadership capabilities were rated as “strong” or “very strong” by respondents that described their own organization as more innovative than other companies in the same industry.
2. Leadership capabilities were rated as significantly lower or as poor by respondents that described their own organization as “below average”.

Brendel (2001) tested and found a strong bias associated with the culture and leadership of the target entity. Leadership participation and direct involvement was highly related to innovative performance in the surveyed companies. His study of 530 small companies also examined the intellect scores of employees in terms of openness to ideas, risk, actions, activities, and proactive level. High scores in those areas were positively correlated with support for innovation (pp. 60-99).

Henry Chesbrough (2006), noted Harvard researcher, publisher, and expert on disruptive innovation and the power of the open innovation model, has conducted substantive research into

the nature and scope of business transformation. His 2006 book, *Open Business Models; How to Thrive in the New Competitive Landscape*, makes note of the following:

1. “The economics of innovation are negatively impacted by rising innovation costs and shorter revenue streams (product life cycles)”.
2. “The open innovation business model attacks the cost side of the problem by leveraging R&D resources to save time and money in the innovation process” (p.17).

Fleming and Marx (2006) delivered a benchmark statistical study of creativity and sustainable innovation as derived from clusters of intelligent communities built upon a platform of open collaboration, referred to as small worlds. Their work paralleled the earlier research of many other experts in the field (Barsh et al., 2008; Chesbrough, 2006; Porter, 1998b) and supported the notion that clusters of intelligence once isolated by distance and now free to practice and refine open collaboration can and have begun to aggregate into massively connected networks.

Fleming and Marx’s research further defined the concept of small worlds and explored the ways they foster creativity, sustainable growth, innovation, and resulting innovation economics (IE). The researchers collected longitudinal data on networks and used statistical modeling based on U.S. patent filings from 1975 through 1999 to “pick apart structural cause and effect” (p. 8). Their research identified Silicon Valley and Boston as the most dynamic small worlds, giving them a basis for their interviews and sampling.

George Day’s (2007, 2006) research determined that four out of five companies focused on organic growth as a key driver of enterprise value in capital markets. Despite this focus, only 29% of managers of large-cap firms believed this to be an attainable objective. Day’s research into the reasons behind this apparent dilemma pointed to several factors, including: (1) external constraints, (2) organizational impediments, and (3) resource constraints.

These factors combine to produce a growing bias toward safer, incremental line extensions and product improvements. Day (2006) observed that the production of true business transformation, new to the world of innovation in development portfolios, dropped from one fifth to one tenth in the period between 1990 and 2004. Concurrently, the less-ambitious is development of new to the company products dropped by a third. He concluded that companies have a built-in aversion to high risk and a general bias toward incremental short-term product line extension paths. The antidote, Day argued (2006, pp. 1-9), can take several forms, starting perhaps with opening up the innovation process, a “share to gain” mentality, and lowering the risk and associated costs—in other words, innovation economics.

According to Bughin, Chui, and Johnson (2008), world class companies have invested heavily in the concept and application of distributed cocreation (the authors’ term), more commonly referred to in this study as open innovation. Many companies use intellectual input from their networks of suppliers, vendors, and value chain in the creation and innovation process. Companies are also leveraging this technique into their future delivery of products and services. These companies represent the new order of experimentation, design, and implementation. More importantly, they have designed into their product development process, the collective intellect, and behavior of their targeted market segments.

## Continuous Innovation using the Open Model and IE

“Organizations need to change constantly” was the leading statement from the C-level executives’ survey performed by Meaney and Pung (2008) and McKinsey (2010, October) that examined the perspectives of more than 3,000 respondents from industries and regions around the world. Although the respondents saw the need for change, only one third indicated that they achieved their targeted goal. This shortfall was attributed to a variety of reasons, from insufficient alignment and clarity of goals to a lack of direct involvement on the part of senior management. Among those who reported successful transformation, one key common finding was the need to use open collaboration across the entire enterprise for continual commitment and support. This factor was determined to be critical to the successful implementation and for gaining management support, and was the most common planning method used among the most successful group. Further, McKinsey reported that continued communication across silos was deemed more important as a key tactic than accountability. In addition, the successful group indicated the need to build into their cultures

Skarzynski and Gibson (2008) identified three critical preconditions for breakthrough innovation:

1. Creating a space in the daily lives of all the value providers for reflection, ideation, and experimentation.
2. Maximizing the diversity of thinking that innovation requires (requires diverse groups of knowledge, works both inside and outside the company).
3. Combinational chemistry fosters connections and conversation to serve as a Petri dish for ideation (p. 22).

Geoffrey A. Moore’s contemporary works have become standard or required reading for many innovative companies. In his book, Moore (2005) described the science of continuous innovation, and the (innovation) economics associated with the process and its outcomes. Moore described present-day business cycles as “Dealing with Darwinism”. He characterized today’s free-market economies as being driven by the following influences:

1. Competition for consumer demand will stimulate innovation,
2. Consumer preferences for one innovation over another create natural selection,
3. Each new generation restarts the competition from a higher standard than the prior generation,
4. Over time, successful companies must evolve their innovation competence or become marginalized. (Moore, 2005, pp. xiv, xv).

Von Hippel identified three prime conditions that must be present for open innovation communities to work:

1. “At least some of the users have sufficient incentive to innovate”.
2. “At least some of the users have an incentive to voluntarily reveal their innovations, and the means to do so”.
3. “User-led diffusion of innovations can compete with commercial production and distribution” (von Hippel, 2001).

Christensen and Raynor (2003) indicated that corporate organizations are under constant pressure to satisfy both short-term performance goals and long-term strategic objectives. These pressures may often lead enlightened management to consider the elements associated with Disruptive Innovation. To successfully execute this strategy, management's focus must be steady and clear, a daunting leadership task when short-term performance and long-term strategies are not aligned.

### **The Organizational Structure: Shortened Product Lifecycles**

In their research into the nature and impact of open collaboration, MacCormack, Forbath, Brooks, and Kalaher (2007) found two primary factors of note:

1. "Innovation is increasingly driven through collaborative teams, due to product complexity, availability of a low-cost but highly skilled labor pool, and advances in technology".
2. "Collaboration adds to the top and bottom lines by shortening development times, increasing capacity, and facilitating access to skills, capabilities, and intellectual property, often facing internally" (Silverthorne, 2007).

Worley and Lawler (2006) examined the impact of globalization and fast-paced social change on organizational structure, and found that successful corporations adapt by incorporating flexibility and continuous innovation in their corporate DNA. They suggested that change is best accomplished by those organizations that are designed with change as a core competency, or those that designate change as a strategic initiative, with all the attendant support and accompanying resources.

Christensen and Raynor (2003) in their research describes that collectively the deconstruction of large problems and the concurrent requirements for new vision and opportunity mining in the minds of the participating parties form perhaps the first level of the "Level Three" transformational journey. The authors identified a vital set of bundled influences on this transformation to a new organizational construct. They called this bundle "the right stuff," and defined the components as resources, processes, and values, or RPV (Christensen & Raynor, 2003, p. 178). Christensen and Raynor argued that "resources and processes are often enablers that define what an organization can do; values often represent constraints, they define what the organization cannot but should do" (p.186).

Jonash (2000) researched industry leaders who had been able to drive sustainable growth and innovation over the long term. He framed his study using the following arguments:

1. Shareholder value is a function of continued (organic) growth and innovation. Note: This finding is also consistent with Christensen (1997) and Christensen and Raynor (2003).
2. Raising the sustainable growth expectations of investors is also a function of a successful track record of accomplishments and deliverables.
3. This strategy requires entities to focus on driving organic growth using successful innovation, in addition to cost-cutting, M&A, and operational excellence.

Further, Jonash's research uncovered four unique characteristics among the industry leaders he studied: (1) strategy selection, (2) market knowledge, (3) flexibility, and (4) metrics. (Jonash, 2000).

Christensen, Johnson, and Rigby (2002) provided an executive blueprint for accomplishing disruptive innovation. They described this significant Level Three change as allowing companies to enter new markets and introduce new products.

The collective body of research has identified the following growth factors common to continually successful innovative enterprises: (1) open model collaboration, (2) innovation economics, (3) level three change transformation, (4) senior level commitment, (5) organizational alignment, (6) organic growth, and (7) value creation.

## **HYPOTHESIS**

Hypothesis One: The open model for collaboration and experimentation will be positively associated with growth and innovation.

Hypothesis Two: Shortened product life cycles will be positively associated with growth and innovation.

Hypothesis Three: Innovation economics will be positively associated with growth and innovation.

Hypothesis Four: There is a positive significant competitive advantage for Domestic, International, and Global corporate entities using Business Transformation and Innovation Economics.

## **METHODOLOGY**

### **Research Design**

This study used a non-random convenient sample to examine the experiences of business leaders, thought leaders, and C-level executives (Presidents, CEOs, CTOs, CFOs, CMOs, and COOs) regarding the impact of transformational factors—the open model for collaboration, shortened product lifecycles, and innovation economics—on successful growth and innovation.

The mixed method qualitative and quantitative (descriptive) approach was the chosen methodology given the nature of the research problem. The in-depth qualitative interviews consisted of direct (face-to-face or phone) interviews with ten senior (C-level) business leaders. The ten senior business leaders interviews were not part of but in addition to the quantitative survey sample. The quantitative data was collected using a survey instrument based on a Likert Scale enabling reliability and Chi-Square analysis.

The quantitative survey instrument consisting of fifty-six questions was developed and pilot tested before administering it to a second larger sample group consisting of 50 participants. The survey instrument considered the following key components: (1) alignment, culture and commitment for successful innovation and growth, (2) resources and commitment, (3) product life cycle, (4) innovation, (5) innovation economics, (6) collaboration and open innovation model, (7) sustainable competitive advantage, (8) measurement and metrics, (9) future expectations, and (10) respondent and industry demographics. The survey construct built in a level of redundancy in the questions to insure consistency of the responses. Several questions

were asked more than once in later parts of the survey to test the respondent's consistency. The quantitative and qualitative survey questionnaires are shown in the Appendix.

The survey instrument was distributed to professional C-level associations (obtained from The Greater Philadelphia Senior Executive Group; Database of C-level executives from fortune 500 companies) for member sampling distribution. The targeted sample groups received a survey invitation letter to elicit their interest. The desired quantitative sample distribution survey was targeted at 50 usable respondents. The result was 40 usable respondents.

### **Data Collection Process**

The data was collected simultaneously from quantitative and qualitative surveys. Out of 50 questionnaires administered to C-level executives, 40 were received. No quantitative surveys were found to have substantive missing values. Descriptive statistics and measures used and applied in the quantitative survey included the following: Chi-Square analysis, Reliability (Cronbach Alpha), and Cross Tabulation analysis. Out of the 10 qualitative interviews, one interview was deemed incomplete and not used. The qualitative data was examined for patterns and themes that relate to open collaboration and experimentation, product life, and innovation economics.

## **DATA ANALYSIS AND RESULTS**

### **Survey Reliability**

The quantitative reliability and the associated Cronbach Alpha values in the study range from 0.663 to 0.924. These values indicate good reliability of the survey responses. A reliability of 0.5 to 0.7 or greater is considered acceptable measure (Law & MacDermid, 2008, p. 278-279).

### **Demographics**

The survey respondents included C-level executives (Presidents, CEOs, COOs, CFOs, CMOs, CTOs, Thought Leaders, and Consultants), with an average of thirty years or more of experience in their leadership position. The 40 quantitative survey respondents represented the following cross section: Manufacturing (ten), Service (fourteen), High Technology (twelve), and Retail (four). The respondents' average number of years in a leadership position ranged from a low of 20 years to a high of 37 years. Most of respondents centered in the 30 years or more range (34 respondents out of 40 or 85%). Additionally, the responding entities are characterized by revenue size and market types as follows: Domestic 8, International 22, and Global 10. The annual revenues for domestic companies ranged from \$1 to 500 million, for international companies revenues ranged from \$500 million to \$250 billion, and for global companies revenues ranged from \$500 million to \$250 billion and above

### **Hypothesis Testing**

Hypothesis One: The open model for collaboration and experimentation will be positively associated with growth and innovation

## **Alignment, Culture, and Commitment for Successful Innovation and Growth**

The overall results of six questions on alignment, culture, and commitment indicated that 82.5% to 95% of the respondents agree to strongly agree on key success factors that open model for collaboration and experimentation is positively associated with innovation and growth in areas of sustainable growth and innovation as a function of continuous built-to-change model concept. This observation is similar among all four industry segments – manufacturing, service, high technology and retail (Chi-Square:  $p = 0.282$  to  $0.971$ ).

## **Resources Commitment**

The overall results of five questions on resources and commitment indicated that 42.5% to 60% of the respondents stated under consideration to certain in currently have or planning to have in place that open model for collaboration and experimentation is positively associated with resources commitment in areas of open innovation and open modeling experimentation and sustainable growth and innovation as a function of continuous built-to-change model concept. This observation is similar among all four industry segments – manufacturing, service, high technology and retail (Chi-Square:  $p = 0.384$  to  $0.751$ ).

## **Collaboration and Open Innovation Model**

The overall results of three questions regarding collaboration and open innovation, 65 % of respondents considered implementation level at medium to high value for partnership/joint venture, 85% medium to high value for partnering, and 60% medium to high value for formalization of innovation practice, that open model for collaboration and experimentation is positively associated with growth and innovation in areas of open innovation and open modeling experimentation. This observation is similar among all four industry segments – manufacturing, service, high technology and retail (Chi-Square:  $p = .108$  to  $.938$ ).

Hypothesis Two: Shortened product life cycles will be positively associated with growth and innovation.

## **Product Life Cycle**

The overall result on the question of product life cycle, most respondents (75%) considered that the average time to market was in the range of 1- 24 months or shortened product life cycles is positively associated with growth and innovation in areas of continuous level three transformation. The observation is consistent among all the four industry segments (Chi-Square:  $p = 0.704$ ) and the strongest support was found among the high technology and service sector respondents.

The overall results of additional three questions on product life cycle indicated 35.8% to 82.5% respondents considered more than some to greatest impact on shortened product life cycles is positively associated with growth and innovation in areas of drivers of product differentiation, and real growth. This observation is similar among all four industry segments – manufacturing, service, high technology and retail (Chi-Square:  $p = 0.157$  to  $0.651$ ).

Hypothesis Three: Innovation economics will be positively associated with growth and innovation.

### **Innovation**

The overall result of the question on future growth indicated 56.7% of respondents forecast that innovation would contribute 10% to above 20% towards future revenue growth is positively associated with growth and innovation in areas of innovation economics-options for implementation. This observation is similar among all four industry segments – manufacturing, service, high technology and retail (Chi-Square:  $p = 0.073$ ) and the strongest support was found for the high technology sector respondents.

The overall results of additional three questions on innovation indicated 70% to 90% of the respondents somewhat agree to strongly agree on the importance that innovation economics is positively associated with growth and innovation in areas of innovation economics-R&D expenditures. This observation is similar among all four industry segments – manufacturing, service, high technology and retail (Chi-Square:  $p = 0.205$  to  $0.801$ ).

### **Innovation Economics (IE)**

The overall result of the question on R&D indicated 50% of respondents' companies spend between 20% to greater than 40% of revenue on R&D that innovation economics is positively associated with growth and innovation in areas of innovation economics-capital budget. This observation is similar among all four industry segments – manufacturing, service, high technology and retail (Chi-Square:  $p = .328$ ).

The overall results of three questions on innovation economics indicated 17.5% to 77.5% of respondents considered very likely to highly likely that innovation economics is positively associated with growth and innovation in areas of continuous portfolio review and its impact on the organizational performance. This observation is similar among all four industry segments – manufacturing, service, high technology and retail (Chi-Square:  $p = 0.183$  to  $0.773$ ).

The overall results of three questions on percent of capital budget allocated to acquisition for innovation, dedicated to organic growth through innovation, and innovation achieved through M&A indicated 42.2% to 79.4% of respondents consider 10% to greater than 20% allocation of the capital budget that there is a positive significant competitive advantage for domestic, international, and global corporate entities using Business Transformation and Innovation Economics in areas of innovation economics. This observation is similar among all four industry segments – manufacturing, service, high technology and retail (Chi-Square:  $p = 0.706$  to  $0.761$ ).

Hypothesis Four: There is a positive significant competitive advantage for Domestic, International and Global corporate entities using Business Transformation and Innovation Economics.

### **Sustainable Competitive Advantage**

The overall results of three questions on collaboration by value chain partners and collaboration among competitive members indicated 17.5% to 77.5% of respondents consider very likely to highly likely that there is a positive significant competitive advantage for domestic, international, and global corporate entities using business transformation and innovation



economics in areas of continuous portfolio review and its impact on organizational performance. This observation is similar among all four industry segments – manufacturing, service, high technology and retail (Chi-Square:  $p = 0.183$  to  $0.773$ ).

The overall results of four questions on new market entry of existing and new products/services, continuous innovation, and portfolio review indicated 74.3% to 85% of respondents consider likely to highly likely that there is a positive significant competitive advantage using business transformation and innovation economics in areas of continuous portfolio review and its impact on organizational performance. This observation is similar among all four industry segments – manufacturing, service, high technology and retail (Chi-Square:  $p = 0.133$  to  $0.445$ ).

### **Measurement and Metrics**

The overall results of three questions on innovation metrics of evaluation affecting increases in market share and R&D from new product/service introduction indicated 35.2% to 59% of respondents considered often used to most used metrics that using business transformation and innovation economics is positively associated with growth and innovation in areas of continuous portfolio review and its impact on the organizational performance. This observation is similar among all four industry segments – manufacturing, service, high technology and retail (Chi-Square:  $p = 0.094$  to  $0.730$ ).

The overall results of additional four questions on innovation metrics of evaluation affecting sales from new product/service introduction indicated 51.3% to 73.75% of respondents considered much used to most used that using business transformation and innovation economics is positively associated with growth and innovation in areas of continuous portfolio review and its impact on the organizational performance. This observation is similar among all four industry metrics and that shortened product life cycles will be positively associated with growth and innovation in areas of continuous innovation for survival. This observation is similar among all four industry segments – manufacturing, service, high technology and retail (Chi-Square:  $p = 0.110$  to  $0.969$ ).

### **Qualitative Analysis**

The qualitative analysis is based on both ten in-depth face-to-face interviews of C-level business leaders and thought leaders and responses obtained from open questions asked in the quantitative survey to 40 C-level executives (Presidents, CEOs, CTOs, CFOs, CMOs, COOs, Thought Leaders, and Consultants) regarding the impact of transformational factors, the open model for collaboration, shortened product lifecycles, and innovation economics on successful growth and innovation. The qualitative survey questionnaire is shown in the Appendix.

The following are selected interview responses associated with the study hypotheses.

Interview question: What are considered to be key factors for successful Innovation and Growth?

The following are the main themes most cited by the respondents: (1) culture supportive for innovation and growth consisting of an acceptance of failure, risk, and a sense of urgency, (2) clear vision and alignment, (3) a process to rank opportunities and turn them into reality, (4) leadership in terms of committed support, (5) available resources, and (6) continuous collaboration and experimentation.

Interview question: How effective or ineffective have your key factors been for innovation and growth?

Most stated very effective to extremely effective and a large contributing factor or what some stated as a “critical success factor” to past and future successful growth. Some that indicated marginal success stated they needed to reevaluate resource placement and consider a process of continual portfolio review.

Interview question: What organizational mechanisms, practices, methodologies, etc., are in place now at your company?

The main themes and examples from this qualitative survey question are:

Centralization – Most respondents indicated (9 out of 10) the presence of a formal or semi-formal centralized/decentralized function, and a strategic commitment with visibility and accountability to senior management. Respondents indicated a central board that reviewed the projects and tracked the programs and communicated (open collaboration) throughout the company for top innovative projects. This, they state, insures the cultural shift.

Short Product Life Cycle management, a reoccurring theme: Most (9 of 10 respondents) stated that the window of opportunity to address, formulate and implement new products and services was very important to sustainability, and is short and decreasing.

Decentralized authority to “make it happen”: Most respondents (8 out of 10 respondents) indicated that divisional business managers have the authority to bring new innovation to an oversight committee i.e., an innovation board, for review and funding. Three out of ten respondents indicated they have within their respective areas of divisional control the budget to fund up to USD10million of startup projects.

Processes and methodologies in place included: All respondents cited one or more of the following: Executive commitment/committee review; Central innovation focus and strategic priority- board level accountability; Open collaborative process internally and externally; Stage Gate Innovation Process; Strategic Partnering; Joint Ventures.

Interview question: What are the factors that impact PLC innovation?

The respondents provided the following statements: (1) legal and regulatory issues, (2) the knowledge worker, (3) innovation economics, (4) lack of continuous innovation, (5) lack of open collaboration, (6) internal support and politics of size, (7) leadership and commitments, and (8) short life cycles and technology.

Interview question: How important has Growth and Innovation been in meeting your organizational goals and targets?

All respondents stated, “Very to extremely important” as their response (10 out of 10).

Interview question: What are the key categories receiving resource allocations for purposes of innovation and growth?

Most respondents cited Research and Development for sustainable growth. Many respondents indicated that aversion to risk could be a ‘cultural block’ and indicated that leadership is required to neutralize this factor. One respondent indicated these two principles (risk and leadership) can be at odds. Many respondents indicated the need and necessity to integrate Voice of the Customer (VOC) into their continuous need to innovate. This was seen as a business imperative and a driver of successful product development, differentiation and growth.

Interview question: How would these challenges affect success for Innovation and Growth?

Respondents' cited: (1) biggest challenge - not being able to get done fast (time-to-market) enough to sustain organization creditability, (2) companies that don't have a business priority for continuous innovation (not just words, but committed resources) are being absolutely crushed in this (economic) downturn. "Look around and note the big names!", (3) a time-to-market in today's market of 18 months as a cut-off measurement. Projects with longer time horizon are considered a long term projects with funding often in competition with short term cash needs, (4) most important requirements for the company's business transformation process as shared vision and passion, followed by accountability, (5) if the business plan is geared to innovation and collaboration, tracked and monitored (performance) against objectives, then factors for success are increased, and (6) continued product/service life cycle compression; manufacturing companies do not anticipate this trend will experience the same result as the US auto, chemical, airline, industries found, e.g., a marketplace demanding new rapid change and a flexible production function; being serviced by companies competing on declining price and profit margins. At best, it's a losing proposition.

Interview question: Is innovation funding and allocation based primarily upon?

Most stated innovation funding and budget was based on this year's goals and opportunities and on last year's goals and available opportunities. Many indicated: prior year's budget; few indicated: percent of sales.

Interview question: What has your company considered in the areas of collaboration and open innovation model?

Most (90%) stated R&D partnerships, partnering agreements and formal approach to innovation (internal committees, innovation boards, Universities, partnering with clients and customers, open models for collaboration, workshops).

Interview question: How would you describe sustainable competitive advantage, and collaboration?

Most stated the process of continuous review of projects, along with continuous open collaboration against key metrics as critical success factor. Most stated the open communication model supports collaboration and development gained from shared learning and risk avoidance. Examples were cited of co-development and risk avoidance that facilitated rapid product introductions satisfying time-to-market concerns and producing continued management support, lower cost of new product development, and higher returns on R&D. Respondents further indicated that these statements are supported by metrics other than percent of sales and new product launches. These metrics do not fully identify the contribution gained from methodologies associated with portfolio reviews. Respondents indicated that a complete portfolio review considers "GAP analysis" defined as the detailed difference or delta, that exist between where your organization (product/service wise) is today versus where your organization needs to be, in terms of the competitive landscape. This GAP analysis is monitored and plans are continuously reviewed, which included but not limited to re-allocation of resources to minimize the GAP. The GAP represents time, resources and associated economic values.

Interview question: Can you indicate what metrics are used to evaluate growth and innovation's contribution?

Most respondents stated the following as key metrics: Potential of new product/service portfolio to meet growth targets using a GAP analysis; revenue and profit growth from new products/services; customer satisfaction from new products/services; percentage of sales from new products/services introductions; return on investment on new products/services; time to market- how fast innovation is brought to market to drive the above metrics; and the potential of

new products/service portfolio to meet growth targets-respondents indicated the critical need for continued innovation in the face of shortening product life cycles.

The following are some of the responses to open questions asked in the quantitative survey to 40 C-level executives (Presidents, CEOs, CTOs, CFOs, CMOs, COOs, Thought Leaders, and Consultants) regarding the impact of transformational factors, the open model for collaboration, shortened product lifecycles, and innovation economics on successful growth and innovation.

Survey Respondent 13 stated the following: “I believe that now people need to be much more entrepreneurial. As Michael Porter says, focusing on process improvements isn’t strategy. Many/most bigger companies are familiar/use various innovation processes (e.g. stage-gating). What is needed now is less emphasis on slavish adherence to the process “du jour”, and much more entrepreneurially prudent risk taking. This process needs to be consistently supported and championed by the CEO on down.”

Survey Respondent 15 states: “It is believed that many companies have outsourced based on cost economics ignoring the value of integrated and open communication across the entire organization. Fragmenting the process has an implicit cost that isn’t captured but can be found in loss of innovation.”

Respondent 15 further provides the following statements to the question describing collaboration internally/externally: “Too often this interaction is via contract, bills, as opposed to cooperative relationships that drive collaboration. As a company in the technology sector, I see the easy access of technology communication (email, voicemail, and other tools) has both helped and hurt the collaboration process. Helped in the sense, that communication options are better in real time and batch modes. Hurt in that technology communication tools start with a natural impersonal barrier that, when not used properly, can lead to miscommunication or the ability to “hide behind the curtain” on forming the right relationship to achieve innovation.”

Survey Respondent 19 states: “The answer depends if you use the information proactively or reactively. There should be a clear vision (Hypothesis 1) for the company with a reality check based on current and future economics (Hypothesis 3). If the projections don’t meet the vision, transformation is required (Hypothesis 4). Proactive transformation will lead to a competitive advantage. The lack of a realistic vision and reactive transformation create a ‘me too’ company without a competitive advantage.”

Survey Respondent 21 states: “Competitive advantages are short lived now more than ever. We must always keep the pipeline filled (continuous innovation) in order to sustain advantages.”

Survey Respondent 22 states: “On the question of the future of use of business economics and business transformation: Very important... The speed of change and innovation has increased tremendously. In order to remain competitive, firms must embrace innovation or perish. Business economics needs to be better understood and utilized.”

Survey Respondent 28 states: “On the question of the future of use of business economics and business transformation: Globalization and technology has made information exchange highly rapid and visible. With these changes it is imperative that companies innovate and collaborate bringing their competencies to the table to accelerate opportunities for profitable growth. The rate of change regarding companies and customers expectations continues to accelerate making it economically infeasible for most companies to go it alone regarding innovative growth.”

Survey Respondent 30 states: “I believe these concepts (business economics and business transformation) can be highly successful and impactful with leadership support and education.”

Survey Respondent 33 states: “Belief: In the 21<sup>st</sup> century business economics and business transformation for successful/sustainable competitive advantage will be critical. Organizations no longer have the luxury of being isolationist.”

Sustainability: “The concepts that help businesses leverage diversity, constant innovation and constant reinvention will be necessary to support sustainable competitive advantage.”

Survey Respondent 35 states: “Our CEO is a global evangelizer for this belief-which the world is being transformed by new technology and the opportunities it presents to change the way we live, work, play and learn. The increasingly pervasively connected nature of devices and people and the flattening of the global competitive landscape are forcing our company to innovate faster, get to market faster, and involve more partners/customers in the entire value chain for idea to product/service.”

Respondent 35 further states: “We have strategic alliances in place with over a dozen key integration/distribution partners to develop packages of solutions combining our products/services and their IP and consulting/integration services.”

## CONCLUSIONS AND RECOMMENDATIONS

Hypothesis One: Open model for collaborations and experimentation will be positively associated with growth and innovation.

This study showed that the open model for collaboration and experimentation will be positively associated with growth and innovation. These findings were consistent with other authors' research: Barsh, Capozzi, and Davidson, (2008); Brendel, (2001); Dooley and O'Sullivan (2001); Christensen (2006, 2008); Christensen and Raynor (2003); Day (2007); and Jonash's (2000).

Findings based on significant results and interviews conducted with C-Level executives across different industry sectors, uncovered a constant theme. That is, companies often state a positive significant competitive advantage can be achieved using business transformation and innovation economics.

Open collaboration and experimentation significantly contributed to faster product introduction with lower risk and lower costs. Most respondents indicated in their survey selections and statements that an open model for collaboration and experimentation will be positively associated with growth and innovation, and that resources, organizational culture, commitment of senior management, leadership, open model for collaboration and innovation are critical business success factors and drivers for global competitive advantage and sustainable growth.

Hypothesis Two: Shortened product life cycles will be positively associated with growth and innovation.

This study showed that shortened product life cycle will be positively associated with growth and innovation. These findings were consistent with other research on innovation and product life cycles found by Christensen, Johnson, and Rigby (2002). The authors found that due to rising costs of R&D and shortened product life cycles, companies were finding it difficult to justify large expenditures into innovation and instead turning to a new model of open innovation. This trend was also noted in this study field surveys. Similarly, Bughin, Chui and Johnson (2008)

noted this trend in their research and referred to their solution as, “distributed co-creation” process.

Most respondents indicated in their survey selections and statements that shortened product life cycles will be positively associated with growth and innovation, and that resources, organizational culture, commitment of senior management, leadership, open model for collaboration and innovation are critical business success factors and drivers for global competitive advantage and sustainable growth.

Hypothesis Three: Innovation economics will be positively associated with growth and innovation.

This study showed innovation economics will be positively associated with growth and innovation. These findings were consistent with other research on resource allocation practices for employing and implementing a business model for continuous innovation in the face of scarce resource availability.

Chesbrough and Appleyard’s (2007) research focused on building an organization capable of focusing on the continuous re-deployment and evaluation of resource commitment with the objective of removal, termination and re-investment as a strategy practice. Barrett, Musso, and Padhi (2009) advocate the use of a continuous portfolio review process to insure continuous innovation and growth producing sustainable competitive advantage. This trend was also consistent among survey respondents.

Most respondents indicated in their survey selections and statements that innovation economics will be positively associated with growth and innovation, and that resources, organizational culture, commitment of senior management, leadership, open model for collaboration and innovation, business economics and business transformation are critical business success factors and drivers for global competitive advantage and sustainable growth.

Hypothesis Four: There is a positive significant competitive advantage for Domestic, International and Global corporate entities using Business Transformation and Innovation Economics.

There is a positive significant competitive advantage for Domestic, International, and Global corporate entities using Business Transformation and Innovation Economics. These findings were consistent with other research on Business Transformation and Innovation economics resource, conducted by: Chesbrough (2003, 2006, 2007); Chesbrough and Appleyard (2007); Day (2007); Dooley and O’Sullivan (2001); Lafley and Charin (2008); Meaney and Pung (2008); Moore (2005); Skarzynski and Gibson (2008); and Worley and Lawler (2006).

Most respondents indicated in their survey selections and statements that there is a positive significant competitive advantage for Domestic, International, and Global corporate entities using Business Transformation and Innovation Economics.

## **Limitations**

Limitations of the research are outlined as following: The sample size, although believed to be representative of the universe, is small. The quantitative survey consisted of forty C-level executive respondents and the qualitative survey consisted of ten senior level executives that were considered to be representative and a good cross section, similar to the quantitative survey respondents. The forty C-level executives were drawn from: manufacturing (ten), service (fourteen), high technology (twelve) and retail (four). However, the number of retail respondents was low at four. Additionally, the responding entities are characterized by annual revenue and

market size. The sample was limited to companies in the following categories: domestic (8), international (22), and global (10).

### **Future Research Opportunities and Recommendations**

This study has added to the growing body of evidence in support of open collaboration and experimentation, and innovation economics for continued growth and innovation, and sustainable competitive advantage. The topics and findings identified in this study should be further researched by the following recommended actions:

1. Future use. Refine the quantitative research survey questions in future discovery and research. Although all the questions are deemed relevant, some research questions were redundant and sought different informational responses within a survey category, i.e., Measurement/Metrics for innovation.
2. Survey universe expansion. Continue to solicit quantitative survey respondents. Using the methodology described in this study, in particular the use of invitational responding. Recommendation: by continuing the survey on a quarterly basis with published results, the body of research work will mature and accumulate in importance.
3. Implementation of an Open Model for Sustainable Competitive Advantage (SCA). Using the above steps, create an open model for SCA for the user community of respondents. The community of knowledge participants and respondents will grow and a contemporary knowledge lab that supports and contributes to the SCA knowledge base can be formed. Additionally, this community could share the direct benefits of such a knowledge network.
4. Knowledge Bridge. The bridge between academia and commercial enterprise using the above recommendations to develop and build a knowledge bridge focused on SCA could be of significant benefit to the community and the surrounding ecosystem.

In conclusion, it should be noted that all the survey respondents of this dissertation indicated: a high level of continued interest, and a strong commitment in the study's problem statement refinement, determination and outcome.

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## APPENDIX

### QUANTITATIVE SURVEY QUESTIONNAIRE: INNOVATION ECONOMICS AND BUSINESS TRANSFORMATION

#### I. Alignment, Culture and commitment for successful innovation and growth

1. Question: The following statements are key factors (or if in consulting, you have observed) for successful innovation and growth?  
(Strongly Disagree, Disagree, Agree/Disagree, Agree, Strongly Agree)
- 1.1. Clear incentives for employees and management for innovation (products, services & processes)
  - 1.2. Alignment - clear goals, objectives, targets and metrics for innovation
  - 1.3. Committed funding (internal venture capital, i.e., internal capital earmarked for innovation) for innovation
  - 1.4. Resources (people, technology) are committed for innovation
  - 1.5. Enterprise culture supportive for innovation
  - 1.6. Senior executive engagement, involvement and commitment for innovation

## II. Resources and Commitment

2. Question: To date how has your company (or if in consulting, you have observed) allocated resources and investments among these categories of innovation?

(Ineffectual, Unsatisfactory, Fair, Good, Extremely Well)

2.1. Product innovation

2.2. Process innovation

2.3. Technological innovation

2.4. Distribution innovation

2.5. Business Model – changed for innovation focus

3. Question: Which of these organizational mechanisms does your entity (or if in consulting, you have observed) currently or plan to have in place to facilitate innovation?

(No plans, Uncertain, In the plan, Certain)

3.1. Strategic plan for innovation

3.2. An innovation Board/Committee council for review and tracking

3.3. Innovation Knowledge base access

3.4. Central source, process for innovation research and evaluation

3.5. Partnering/collaborative process with research or academic centers dedicated to innovation

3.6. Other

## III. Product Life Cycle (PLC)

4. Question: For each of the following statements describe what you believe to be the most challenging (or if in consulting, you have observed) for innovation success?

(Low, Not Very, Somewhat, Highly)

4.1. Shorten product life cycles

4.2. Global competition

4.3. Leaders do not generally value innovation

4.4. Leaders do not generally become engaged

4.5. Aversion to risk

4.6. Easy to copy and replace

4.7. Government restrictions

4.8. Regulations

4.9. International trade barriers

4.9.1. Organization does not encourage innovation

4.9.2. Lack of strategic commitment

4.9.3. Lack of open environment for idea exchange and collaboration

5. Question: What is the average life cycle of your (or if in consulting, you have observed) products (top 25% of your products and services by region? [North America – Europe- Asia Pacific- Developing Markets]

(Less than 1, 1-2yr, 2-3 yrs, 3-4 yrs, 4-5 yrs, 5- 10 yrs, 10Years or more

5.1. Average product life cycle top 25% of the portfolio in North America

5.2. Average product life cycle top 25% of the portfolio in Asia Pacific

5.3. Average product life cycle top 25% of the portfolio in Europe

5.4. Average product life cycle top 25% of the portfolio in Developing Markets

5.5. Average product life cycle top 25% of the portfolio in other:

6. Question: What do you expect to happen to the product life cycle (or if in consulting, you have observed) in the next 3 to 5 years?

Significant Decrease Slight Decrease Stay the Same Slight Increase Significant Increase

6.1. Average product life cycle top 25% of the portfolio in N.A.

6.2. Average product life cycle top 25% of the portfolio in Asia Pacific

6.3. Average product life cycle top 25% of the portfolio in Europe

6.4. Average product life cycle top 25% of the portfolio in Developing Markets

6.5. Average product life cycle top 25% of the portfolio in other:

7. Question (check the most appropriate response): For the top 25% of your products, (or if in consulting, you have observed) what is the 'average time to market' (idea to commercialization) for your company?

7.1. 1-12 months\_\_

7.2. 12-24 months\_\_

7.3. 24-36 months \_\_

7.4. Greater than 36 months \_\_\_\_

8. Question: For each statement, what are the factors that impact your (or if in consulting, you have observed) Product Life Cycle innovation?

Scale: 1(Least) - TO -7 (Greatest)

8.1. Leadership

8.2. Resource availability

8.3. Employee skills and knowledge

8.4. Technology

8.5. Complex products and systems

8.6. Competition shortens life cycle

8.7. Availability of substitute products

8.8. IP rights protection

#### IV. Innovation

Scale: 1 (Least) to 7 (Greatest)

9. How important has innovation been in meeting revenue target over past 1 to 3 years?

10. How important is innovation in meeting corporate financial goals in the next 3 years?

11. How important is the ability to have an open environment that encourages idea exchange and collaboration?

12. Is innovation or will innovation become a strategic priority for your company

12.1 Strategic priority by region: Asia-Pacific?

12.2 Strategic priority by region: Europe?

12.3 Strategic priority by region: North America?

12.4 Strategic priority by region: Developing Market

#### V. Innovation Economics (IE)

R&D/Innovation-PERCENT RANGES: 0-3%, 3-10%, 10-15%, 15-20%, Above 20%

13. What percent of your R &D (or if in consulting, you have observed) expenditure is dedicated to innovation?

14. What percent (average for the last three years) of the total R&D (or if in consulting, you have observed) expense dedicated to innovation is allocated to geographic markets:

14.1 Domestic

14.2 Global

Capital Expenditure - Percent Ranges: 0-5%, 5-10%, 10-15%, 15-20%, Above 20%

15. On average, what percent of the capital budget will be allocated (or if in consulting, you have observed) toward acquisitions for innovation?

16. On average, what percent of the Capital budget will be dedicated (or if in consulting, you have observed) to organic (internal growth, rather than M&A) growth through innovation?

17. On average, what percent of the Capital budget will be dedicated (or if in consulting, you have observed) to innovation achieved through M &A?

18. On average, what percent of your (or if in consulting, you have observed) future growth (next 3- 5 years) do you forecast to be derived from innovation (new to the world products/services)?

19. Is innovation funding and allocation (or if in consulting, you have observed) based primarily upon (check all that applies) :

19.1. Last year's goals and available opportunities

19.2. This year's goals and opportunities

19.3. Prior year's budget

19.4. Percentage of sales

19.5. Other

20. On average, what percentage of your revenue growth (or if in consulting, you have observed) over the last 3-5 years can you attribute to innovation (new to the world) expenditures?

20.1. Equal to less than 3%

20.2. Between 3 – 10%

20.2. Between 10 – 15%

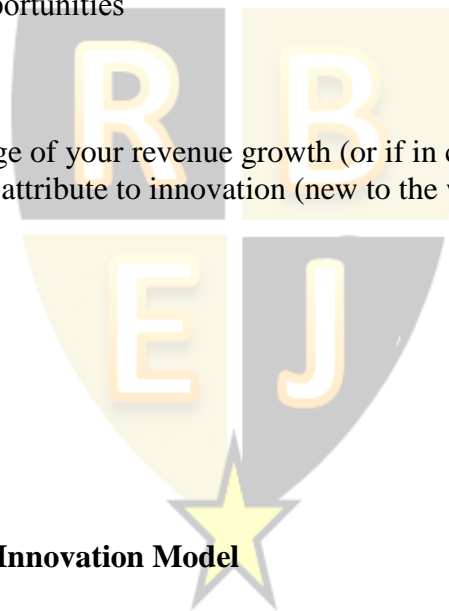
20.4. Between 15 – 20%

20.5. Between 20 - 25%

20.6. Between 25 – 30%

20.7. Between 30 - 40%

20.8. Greater than 40%



## **VI. Collaboration and Open Innovation Model**

[Open model for collaboration (i.e., sharing knowledge and resources with other partners-internally/externally), and experimentation (e.g., joint testing and developing, joint manufacturing and marketing)].

The rising costs of R&D and the shortened product life cycles have opened the door for many companies to consider other forms of cooperation and collaboration. Accordingly, please respond to each question in Section VI.

(Low Value, Above Low, Medium, Above Medium, High Value)

21. Has your company (or if in consulting, you have observed) considered any of the following options for implementation?

21.1. R &D Partnerships/JVs

21.2. Partnering agreements

21.3. Formalization of innovation practice, i.e., a strategic business focus for the company

21. Designing an innovation network (please describe)

22. Other forms of Domestic, global, or selective cooperation and collaboration  
Sustainable competitive advantage in your company (or if in consulting, you have observed) is best described by each of the following:

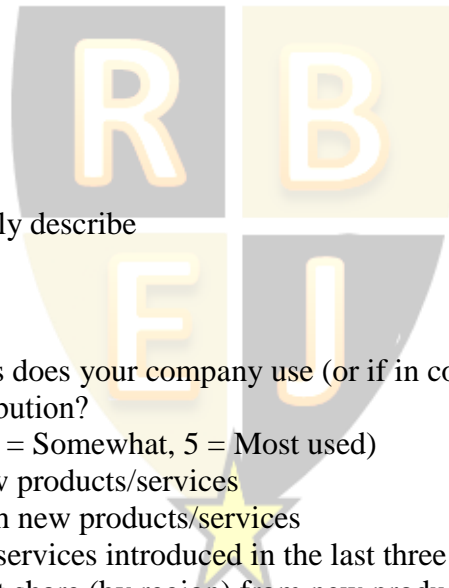
(Scale 1 to 5: 1 = Least likely, 3 = Somewhat, 5 = Highly likely)

23. New market entry of existing products/services
24. New market entry of new products and services
25. Continuous innovation
26. Focus process of portfolio review (continuous evaluation/re-allocation of existing products/services)
27. Other

Collaboration is best described by the following statements (respond to each):

(Scale 1 to 5: 1 = Least often, 3 = Somewhat, 5 = Most often)

28. One or more of the partners in the value chain
29. Between and among the competitive members
30. Between and among non-competitive members
31. Government (s)
32. University partners
33. Suppliers
34. Customers
35. Consultants
36. Professional associations
37. Internally only
38. Internally and/or Externally describe



## VI. Measurement/Metrics

Which of the following metrics does your company use (or if in consulting, you have observed) to evaluate innovation's contribution?

(Scale 1 to 5: 1 = Least used, 3 = Somewhat, 5 = Most used)

39. Revenue growth from new products/services
40. Customer satisfaction with new products/services
41. Number of new products/services introduced in the last three years
42. Percent increase in market share (by region) from new products/services introduced in the last three years
43. R&D as a percent of sales
44. Percentage of sales from new product/services introductions
45. Number of new product/service launches
46. Return on investment on new products/services
47. Number of R&D projects
48. Number of people committed to innovation
49. Profit growth due to new products/services
50. Potential of new product/service portfolio to meet growth targets
51. Number of patents filed
52. Number of licensing agreements
53. Time to market – how fast innovation is brought to market
54. Other

## VII. Question on future expectations

What is your belief concerning the use of business economics and business transformation for domestic and global entities in the 21st century. Do you feel these concepts can drive and support sustainable competitive advantage? Under what conditions?

Please explain:

## VIII. Respondent background

55. Leadership experience, C-level position held:

55.1. CEO

55.2. President

55.3. COO

55.4. CFO

55.5. CMO

55.6. CTO

55.7. General Manger

55.8. Consultant

55.9. Other

55.10. Previous leadership position(s) held:

55.11. Years in leadership position of experience:

56. Industry segment (check one):

56.1. Manufacturing

56.2. Service

56.3. High Technology

56.4. Retail



## QUALITATIVE SURVEY QUESTIONS: INNOVATION ECONOMICS AND BUSINESS TRANSFORMATION

### I. Alignment, culture and commitment for successful innovation and growth (I & G)

1.0.1. Main: What are considered to be key growth factors for successful Innovation & Growth (I&G)?

1.0.2. Supplementary: Can you provide examples of key growth factors where success or failure was achieved?

### II. Resources and Commitment

2.0.1. Main Question: What are the key categories receiving resource allocations for the purpose of I & G?

2.0.2. Supplementary: How Effective or ineffective have these resources been for I and G?

3.0.1. Main Question: What organizational mechanisms, practices, methodologies, etc., are in place now?

3.0.2. Supplementary: Can you provide examples where they helped or did not help in facilitating innovation?

### **III. Product Life Cycle (PLC)**

4.0.1. Main Question: What are some of the biggest challenge for successful I & G?

4.0.2. Supplementary: How would these challenges affect success for I & G?

4.0.3. Supplementary: Short product/service market life can be good or bad issue, is it a factor for you?

5.0.1. Main Question: What is the average life cycle of the top 25% of your products/services by region or country?

5.0.2. Supplementary: How does this compare to the competition?

6.0.1. Main Question: Do you expect this (Avg. PLC) to change in the near future (3-5 years)?  
By region?

7.0.1. Main Question: For the top 25% of your products what is the average “time to market” (Idea to commercialization)?

7.0.2. Supplementary: Will this change in the near future?

8.0.1. Main Question: What are the factors that impact your PLC innovation?

8.0.2. Supplementary: Please explain by example, how these factors help or hurt your ability to achieve I & G?

### **IV. Innovation**

9.0.1. Main Question: How important has G & I been in meeting your goals & targets (organizational)?

9.0.2. Supplementary: Give an example or two of how organizational goals and targets are met.

10.0.1. Main Question: How important is innovation in meeting corporate financial goals in the next 3 years?

10.0.2. Supplementary: Give an example or two of how corporate financial goals are met.

11.0.1. Main Question: How important is the ability to have an open environment that encourages idea exchange and collaboration?

11.0.2. Supplementary: Give an example or two of how an open environment encourages idea exchange and collaboration.

12.0.1. Main Question: Is growth & innovation or will growth & innovation become a strategic priority for your company?

12.0.2. Supplementary: What are the strategic priorities for your company?

12.0.1.1. Main Question: Strategic priority by region: Asia-Pacific? Europe? North America? Developing Country?

12.0.2.1 Supplementary: what are your key goals & targets for successful growth & innovation?

12.0.2.2 Supplementary: What are the strategic priorities for the company?

### **V. Innovation Economics (IE)**

13.0.1. Main Question: In the past 3 years, on the average, what resource dollars (R&D) are committed to supporting your efforts in I & G?



14.0.1. Main Question: What percent (average last 3 yrs) of the total R&D expense dedicated to innovation is allocated to Domestic markets?

14.0.2. Main Question: What percent (average last 3 yrs) of the total R&D expense dedicated to innovation is allocated to Global markets?

15.0.1. Main Question: On average, what percent of the capital budget will be allocated toward M&A for innovation and growth?

16.0.1. Main Question: On average, what percent of the capital budget will be allocated toward organic (internal) growth for innovation and growth?

17.0.1. Main Question: On average, what percent of the capital budget will be allocated toward innovation achieved through M&A?

18.0.1. Main Question: On average, what percent of your future growth (next 3-5 years) do you forecast to be derived from innovation (new to the world products/services)?

19.0.1. Main Question: What is the internal funding for growth & innovation primarily tied to?

19.0.2. Supplementary: What would cause this to change in the near future?

20.0.1. Main Question: On average, what percent of your revenue growth over the last 3-5 years can you attribute to innovation (new to the world) expenditures?

## **VI. Collaboration & Open Innovation Model**

21.0.1. Main Question: What has your company considered in the areas of collaboration and open innovation model?

21.0.2. Supplementary: Please provide some specific examples of your company successes and/or failures of collaboration and open innovation model.

22.0.1. Main Question: What other forms of Domestic, Global, or selective cooperation and collaboration?

23.0.1. Main Question: How do you describe Sustainable Competitive Advantage (SCA)?

23.0.2. Supplementary: Please provide some specific examples of SCA that relate to your company I & G.

Collaboration

28.0.1. to 37.0.1. Main Question: How do you describe collaboration?

28.0.2. to 38.0.1. Supplementary: Can you provide some examples and describe the partners?

## **VII. Metrics and measurement**

39.0.1. to 54.0.1. Main Question: Can you indicate what metrics are used to evaluate growth and innovation's contribution?

39.0.1. to 54.0.1. Supplementary: Which of these metrics contribute most to G and I?

## **VIII. Future expectations**

Main Question: what are your beliefs concerning the further growth and innovation prospects in the 21st century?

Supplementary: What is the basis for your view?

## **IX. Respondent's background**

55.0.1. Main Question: What functional role have you performed in?

55.0.1. Supplementary: Number of years in professional leadership role?

56.0.1. Main Question: Previous leadership positions held?

56.0.1. Main Question: What industry segment (Manufacturing, Service, HT, Retail)?

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