

New Modes of Competition: Implications of the Future of Dynamic Instant Innovation for Accelerating Instantaneous Competitive Advantage

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要 旨

本稿では、変化の激しい環境下において、業務機能のコンピタンスを統合、構築、再構成する能力（DC）をベースにして、迅速な動的対応（DII）がもたらす価値についての説明を試みた。ハイパーコンペティションの環境下におけるグローバルな市場の流れとそのダイナミックな動きを考察すると、技術的なブレイクスルーと DC 及び DII の次の市場における競争を先取りする速さが、既存の市場に破壊をもたらしている。現代の市場は、競合を自社にとっての競争の原動力に変え、企業が迅速に優位性を確保するために市場内の速さを要求している。『赤の女王効果 Red Queen Effect』はその速さの意義を訴えているが、本稿では、意思決定の速さが企業存続のために決定的に重要であることを示唆した『大渦巻効果 Maelstrom Effect』から発想して、競争の新しい形態をつくるための『触媒化戦略』について提案をする。

Keywords: New Mode of Competition, Instantaneous Competitive Advantage, Red Queen Effect, Maelstrom Effect, Dynamic Instant Innovation, Ambidexterity

1 Introduction

Businesses are finding new ways to compete, which can be thought of as new modes of competition. D’Aveni surmises that business has entered an age of new realities and urges competing companies looking to grow to take advantage of the dynamic motion and flux in the changing climate¹. According to George Sarton, a Belgian chemist, “...the most difficult thing in science is to shake off acceptable views, to observe with one’s own eyes, and think with one’s own brain...”². With this in mind, the author, with nearly four decades of practitioner experience, examines innovation in an organization under hypercompetition. This study integrates the effects of dynamic motion, evolving global markets, and technological breakthroughs.

Empirical analysis on the dynamics of global business competition is demonstrated revealing how Dynamic Instant Innovation (DII) enhances competitive advantage. Drawing from D'Aveni (1994), the author uses his own eyes and brain in applying this theory to a business case study on a medical device organization in the field.

Decision speed has been long recognized as a critical factor explaining firm performance especially in dynamic environments^{3,4,5}. The author posits that “speed” is one of the critical elements in DII. Empirical studies in the past have provided ample support for the benefits of decision speed on firm performance or growth^{6,7}. A focus on decision speed entails the obvious pitfall of comprehensive information gathering and analysis being sacrificed to gain speed. This, in turn, can result in bad decisions and lower performance⁸. However, recent converging of many disruptive innovations-DII, such as two state-of-art IT-driven approaches toward Product Lifecycle Management (PLM) and Building Information Modeling (BIM), specifically developed for Architectural/Engineering/Construction (AEC) and Digital Mock-up (DMU), will lessen the pitfalls⁹.

2 New Modes of Competition:

Under the current hyper competitive environment, Instant Innovation is inevitable for firms to survive and thrive. Innovation, according to Schumpeter, can be defined by the carrying out of new combinations of knowledge¹⁰. Disruptive innovation helps create a whole new market or value network. This type of innovation eventually disrupts an existing market and value network over time, displacing an earlier technology. Furthermore, disruptive innovation is typically simpler, cheaper, and more reliable and convenient than established, legacy technologies¹¹.

3 What is Reverse Innovation / Frugal Innovation - New Modes of Competition?

Traditionally, large multinational companies sought most of their growth and received most of their revenues from home markets. If they looked abroad it was to other wealthy countries. However, reverse innovation is any innovation likely to be adopted first in the developing world. For example, companies develop products in countries such as China and India, and then distribute them globally. “Glocalization” is the process that companies use to export modified versions of global products originally developed for consumers

of the developed world. Glocalization strategies assume that innovation has already occurred and that developing nations are in a slow and evolutionary process of catching up with the rest of the developed world. They will import what the wealthier world develops as soon as they can afford to do so.

Modifications are critical to the glocalization process because, according to Govindarajan, there are seven billion people in the world with three billion are considered rich while four billion are considered poor. Per capita income in India, for example, is just US \$3,000.00 and US \$50,000 in the US. Reverse innovation has the potential to transform wealth in the world. The economic growth in developed countries has slowed down. Ironically, much of the growth is now in developing countries¹². Hence, DII concurrently creates products of reverse innovation and frugal innovation which are exponentially faster-new modes of competition per figure 1¹³.

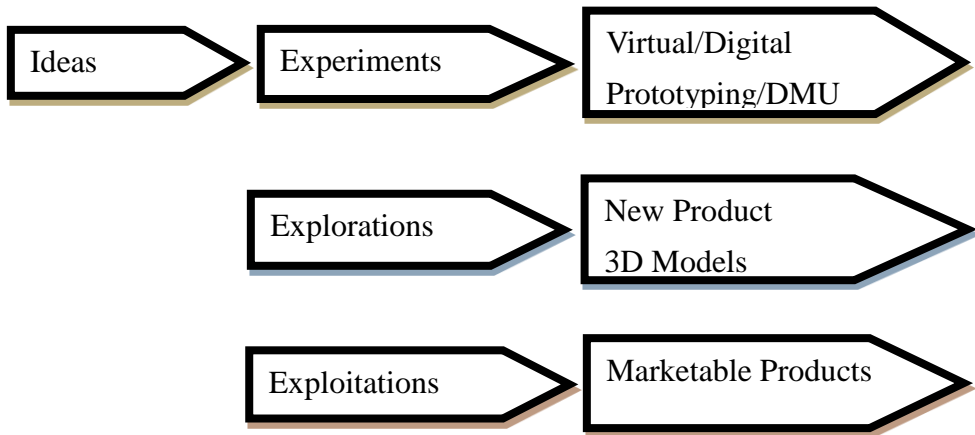


Fig.1. Conversion of Innovation Path by DII

4 Creativity vs Adaptability

“It is not the strongest of the species that survive, nor the most intelligent, but the one that is most responsive to change.”— Charles Darwin. General Motors was the largest and strongest manufacturing firm in USA, Enron was one of the smartest companies, and the hedge firm Long-Term Capital Management L.P. (LTCM) included two Nobel Laureates among its founders. These companies have collapsed¹⁴. Charles O’Reilly et al. opined that Darwin was right, neither strength nor intelligence guarantees survival. Only adaptation can do that, whether for firms or flora and fauna. But the author posits that firms need to do more. Under current hyper competition, in addition to adaption, DII’s creating and changing new markets can help

enhance survival¹⁵.

O'Reilly and Tushman concluded that “There is no convincing evidence suggesting that in order for organizations to survive in the face of change, they need to be able to successfully exploit their existing business and to explore into new spaces by reconfiguring existing resources and developing new capabilities.”¹⁶ This further illustrates that the actions, behaviors, and design choices made by the senior leader comprise the dynamic capabilities that enable firms to simultaneously explore and exploit. This, in turn, emphasizes the key role of strategic leadership in adapting, integrating, and reconfiguring organizational skills and resources to match the changing environment and create a new environment in “rapid speed”. Speed is critical, because decision speed has long been recognized as a critical determinant of firm performance, particularly in a dynamic environment¹⁷.

5 Dynamic Instant Innovation (DII)

Dynamic Instant Innovation (DII) can proceed in parallel among many open integrated parties and industries with the diffusion of more knowledge, to more participants in the industry by using today's multi-platform communication means. The collisions of competing ideas are essential in creating new innovations¹⁸. This can be accomplished albeit through weak-tie social networking on an ad-hoc basis instead of through coordinated efforts. As a result, more parallel experiments are occurring leading to more variety and more choices, which foster more *rapid* innovation. These types of interactions can initiate the creation of new product ideas, particularly if the team is able to coordinate knowledge effectively. Teams that are able to draw from multiple perspectives have been observed to create “wakes of innovation” in project networks which, in turn, create a system of new innovations for project teams¹⁹.

In the literature, IT has been suggested as a critical tool that can mediate the communication and knowledge sharing among distributed and often heterogeneous team members for enhancing innovation. IT literature in the past, however, has tended to treat IT as a “black box” disregarding the innovation development paths²⁰. Understanding and managing these paths, however, is critical for successfully managing the development of innovations. However, little is known “how” or “why” successful innovation develops.

This study addresses this gap by taking into account the many applications of agile ideas by users through the DII model. This model describes the innovation path from prototype development to launch as shown in Fig 1. D'Aveni argues that “If a machine runs at a faster rate, the quality will usually go down. If

service is delivered more quickly, it will be more standardized and less courteous”²¹. Digital Mock-up (DMU) is a concept that depicts a product, usually in 3D, through the entire life cycle. DMU is enriched by key engineering activities (design, manufacturing, and support) that contribute to create any physical prototype. This reduces time-to-market by identifying potential issues early in the design process, which decreases product development costs by minimizing the number of physical prototypes that need to be built. DMU also increases product quality by allowing a greater number of design alternatives to be investigated before a final one is chosen.

Virtual product development (VPD) is design and development through software making use of CAD, FEA, CFD, and PDM which are disruptive innovations. This enables the ability to concurrently take into account more considerations sooner for product and process designs early in the process. Hence, VPD aims to reliably develop a mature product as fast and as less costly as possible²². As such, the concept can be understood as rapid parallel research by individuals across the global spectrum that are loosely integrated by the Internet, thereby leading to Dynamic Instantaneous Innovation. Schutz argues multidisciplinary innovation requires heterogeneous knowledge that needs to traverse through social and cognitive boundaries as it is transformed from information to innovation²³.

Under DII, this diagram shows speedy operation without lowering quality because of disruptive innovation (Virtual /Digital prototyping, 3D printer, CAD, CFD, PDM, etc.).

Users could experiment, implement and popularize new technology at the same instant. Its power exceeds that of concurrent engineering and open innovation. Instant innovation prevails in the user industries by the following steps:

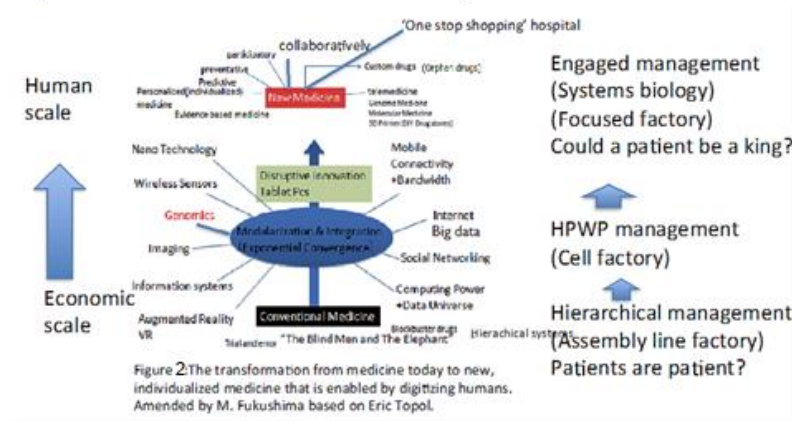
1. Simultaneous processing of multiple information by reciprocal information exchange,
2. Integration of multiple information into businesses,
3. Specialization of users,
4. Users create innovation directly²⁴.

The following examples from instant innovation are:

A new scheme of modularization, adding powerful computation and tabulations for improved efficiency and accuracy brought rapid innovation: INSTANT INNOVATION. Modularization speeded up genome sequencing, making it possible to sequence 30 billion human genomes in 3 days last year. Now it is a matter of instant²⁵. This instant innovation became possible because of exponentially converged by new disruptive innovations per figure 2, namely, nano-technology, wireless sensor, internet, imaging, mobile connectivity,

social networking, computing power and data universe etc.

Individual tools used for medicine must be synthesized to make one Super-Tool



22

Fig.2. Super-Tool Synthesis for Medicine

Another example is DNA arrays that transform genetic sequencing and mapping capabilities. These are the result of combining knowledge domains such as molecular biology and photolithography states that build on the same knowledge domain and have limited upside potential. Those that build on different, complimentary knowledge domains could potentially be valuable²⁶. “Steady improvements in computer software and hardware are making it possible to develop increasingly capable and cheaper tools for innovation that require less and less skill and training to use”²⁷.

Another example of specialization of users by DII is Jack Andraka, a 15-year-old boy who developed a new test for pancreatic cancer. After a family friend died from pancreatic cancer, Jack discovered that there was no useful test to detect pancreatic cancer in the early stages when it can be treated. He researched on Google and Wikipedia to learn as much as possible then put together a proposal to find a way to develop a test for it. He submitted his ideas to 200 doctors and only one was interested and gave him some space in his lab. The results are a test that is non-invasive, costs \$0.03, takes only 5 minutes, and is 100% accurate²⁸.

Instant innovation is enhanced by facilitating user specialization through tailored programming such as downloadable apps, and co-created with customers. This power shift is enforced by an open-integrated

system instead of open innovation. FedEx is letting users further into its own processes, an example of co-creation. The online tracking system is a valuable innovation for FedEx customers²⁹. This system empowers users to take more control of process so as to monitor the status of shipment. This will lead to customer satisfaction, cheaper, faster, better, smarter-Instant Innovation.

6 Ambidexterity

March emphasizes that the ability of a firm to survive is its employees or users' capacity to be equally skillful with both hands, i.e. its ability to exploit existing assets and positions in a profit-producing way and to simultaneously explore new technologies and markets. Firms today need to capture existing as well as new opportunities to configure and reconfigure organizational resources³⁰. Therefore, DII is created by exploration and exploitation and becomes the heart of successful people and organizations. The Roman god Janus had two sets of eyes: one pair focusing on what lay behind, the other on what lay ahead. Musashi Miyamoto, an ancient warrior in Japan could use two swords at the same time. General managers and cooperative executives should be able to relate per O'Reilly and Tushman. They too, must constantly look backward, attending to the products and processes of the past, while also gazing forward, preparing for the innovations that define the future³¹.

The success of Federal Express shows that TMT (top management team) headed by Frederick Smith's vision. Preparing for the DII is a good example compared with Radio Shacks that ambidextrous organization is at the core of DII³². O'Reilly argues the ability of a firm to be ambidextrous is at the core of dynamic capabilities and further shows that senior management's ability to sense changes in their competitive environment, including potential shifts in technology³³. However, the author argues that the ability of a firm to be ambidextrous is not only at the core of dynamic capabilities, but is also at the core of DII. Therefore the author argue that senior management's ability to sense changes in their competitive environment, including potential shifts in technology is enhanced by DII. While the author has not shown any concrete statistics, methodologies, or hypothesis derived from the theoretical analysis of the ambidextrous theory, whether it generally applies to many companies of the world, the author emphasizes its application to one specific company, "INJEX". The author would like to share a paper by Gibson and Birksshaw 2004, of The Antecedents, Consequences, and Mediating Role of Organizational Ambidexterity. The resulting 4,195 interviews from 41 companies from all over the world that shows ambidextrous employees supported their hypothesis³⁴.

In the past 20 years, during Japan's economic slump, Japanese electronics makers were defeated by Samsung. Kawai illustrated the causes of failure of top management of the Japanese makers in fulfilling responsibilities. The causes of failure include (1) failure to sense, (2) satisfaction with the status quo, (3) failure to strategize, less resources, and inability to overcome sectionalism and rigidity, (4) lack of flexibility, and (5) lack of concept of "dynamic strategy". Inability to quickly react and forecast are also factors. In contrast, Samsung's top management fulfilled its responsibility and have made Samsung a household name by incorporating factors ignored or not possessed by its Japanese counterparts. Japanese companies were insufficient in fulfilling responsibility concerning both DSC and DRC³⁵.

7 Applying DII through the Business Case of Needle Free Injection Product Developed by the Author

Medical devices need to be innovated through "Patient Experience Design" and drug or molecular-driven design perspective, which can be thought of as a system or service design perspective. Adapting to unforeseen circumstances require the ability to act decisively, to be both open-minded and confident, and to have a talent for reading messy or hidden data³⁶. INJEX needs to collaborate with alliances, CVC, JV, which have specific mechanisms that enable firms to be successful in managing separate "explore-and-exploit" subunits and leveraging common assets in ways that permit the firm to adapt to new opportunities and threats. It is the presence of these characteristics that helped INJEX to be successful.

The ability to adapt to change like a chameleon by collaborators may need the ability of the senior leadership to manage the conflicts and trade-offs required by ambidexterity³⁷. INJEX has been successful in collaboration with universities and research organizations in Germany, Singapore, Malaysia, Japan and the USA for many years by not focusing on the deal itself but with value-creating relationships. Intel's success was the company's managed relationships with companies that complement their core business, according to Cusmano³⁸.

Similarly, INJEX uses direct sales via its own exclusive distributors worldwide as well as beauty clinics and anti-aging clinics directly. Direct sales to market via its own distribution make it competitive and self-reliant, which allows INJEX to create strong customer relationships. INJEX has successfully entered into niche markets with huge profits such as the beauty markets where regulatory and government restrictions are milder than those in the medical field. These beauty markets are neglected by the major needle syringe

companies such as Becton Dickinson and Terumo³⁹. Barney noted that product differentiation “reduces the threat of rivalry, because each firm in an industry attempts to capture its own unique product niche”⁴⁰. INJEX created the “Shireen” brand for the niche beauty market. Lead users or early adopters of a product or process may become general in the market place in five to ten years. A new niche market has been created in collaboration with INJEX and beauty practitioners since they are familiar with conditions which lie in the future for most others, they can serve as a need for casting team for INJEX marketing research.

INJEX has not competed against major needle syringe companies directly for the reasons outlined in Table 1 and Table 2. In the case of direct competition, all majors could get the win in the newborn markets and all of them did not permit the new entries. Majors will unexceptionally make the best efforts in developing the new product that may replace their main products. In this case, majors have a wealth of experience and information associated with the products. Since majors have many competitive advantages, new entries have little chance. On the contrary to direct competition, all the major’s fate was resigned to the loss of new born market. Derfus et al.’ research of The Red Queen Effect also supports Carroll and Hannan’s density dependence theory, specifically firms founded under conditions of many competitors are less likely to survive in the long term because of scarcity of resources⁴¹.

Table 1. Comparison of Existing Major First-generation vs. New Bio-pharmaceutical Companies

	First-generation bio-pharmaceuticals	New bio-pharmaceuticals
Business result	Win	Loss
Competition	Direct	Indirect/neutral
New products	Replace existing products	Create new markets
New product development	Promoted	Neglected

Table 2. Win/loss Matrix

	Direct Competition	Indirect Competition
Majors	Win	Loss
Newcomers	Loss	Win

8 Applying DII via Building Information Modeling (BIM), composed of 3D Models: Enhancing Efficiency for New Product Development

Developing new products is time consuming because of the necessity for improving products design to be user friendly and also for the betterment of product quality. The operations and maintenance (O&M) phase is the longest one. But of course it is preferable to shorten lead-time for developing new products. It follows such a cycle as shown in Fig. 3 when a new product is developed – from trial production stage to finished mass-production stage under DII.

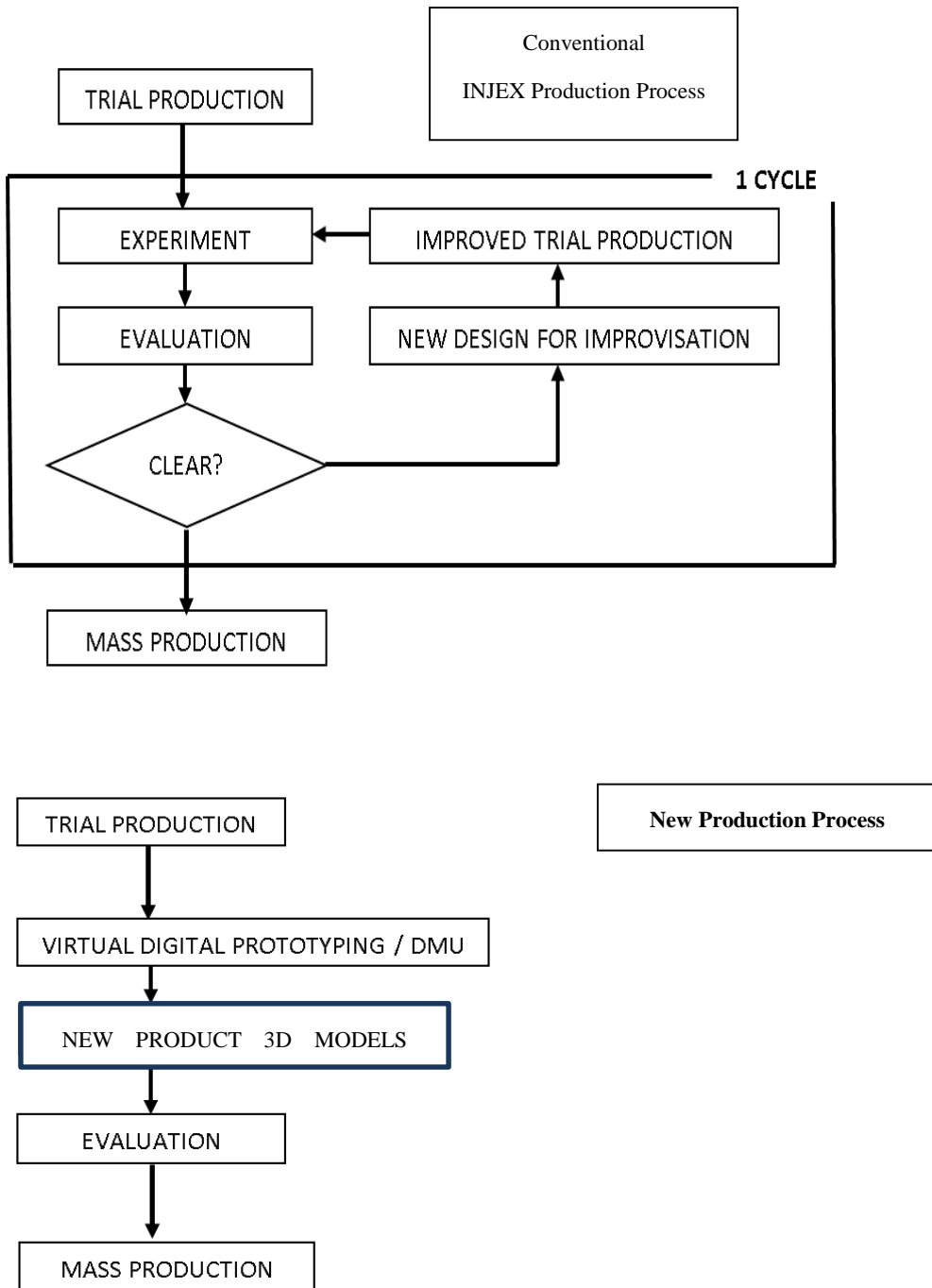


Fig. 3 Flow Chart of New Product Development under DII

To shorten the total lead-time for new development, it is required to shorten each cycle. While working on improved-trial product, next stage workers have to battle idle time without any normal work. So, it is preferable to produce such trial-product when normal production is completed, such as at night or during the holidays. But to change work hours, such as labor-shifts, will be a burden to workers. In order to solve such a problem as mentioned above, the idea of using a 3D Printer is a viable solution. 3D Printers allow for the creation of 3D products using a material stratified method. By using 3D Printers, the process can be set up and allowed to run at the end of normal labor hour without idle time. Then in the morning, the process could be finished and it would be possible to start experimenting immediately. So by utilizing 3D printing, it is possible to eliminate or reduce waiting time during work hour and even overtime and work can proceed effectively with little waste. Furthermore, workers can produce automatically without any special training. A planner working as an operator by himself can perform as if he himself was a manufacturer and the use of 3D printing will work effectively to reduce the number of personnel necessary for production.

Sakikawa reported that the result of his research on the relations between HRM practice and manufacturing performance are not straightforward, and further states that they may be tenuous. Put differently, the system of HRM practice was considered as positively related to improved quality and a shortened lead-time per his hypothesis, however, this hypothesis was negative. It is up to the production manager to implement the designing of products that production workers can assemble easily. He further illustrates that those managerial or professional employees may indirectly affect manufacturing⁴². In the stage of designing products, we devise products that are easy for operators to assemble, and that engineers can design products such that every worker, whether skilled or not, can assemble them with few difficulties. Consequently, even unskilled and contingent workers can be assigned to lines or cells after receiving a few days training, and they will gradually become more productive⁴³.

It may be that engineers and production managers are more involved in production process nowadays than they were before, and they thus increase productivity and other performance measures. In addition to this 3D innovation, instantaneous virtual prototyping is possible under DII. Building Information Modeling (BIM) can impact architecture/engineering/construction (AEC). This can provide a virtually simulated and large integrated database. Another concept similar to BIM is a Digital Mock-up (DMU). This will potentially eliminate the inefficient process of transferring large amount of paper based documents. This concept addressing speed will be validated with future research.

9 DII Digitalization of the Merchandise-flow of the future Needle-free Injector

It is possible to predict different levels of skin hardness for different people, which can cause different volumes of drug to dispense under the skin even if the same pressure pump is applied to each case (sensing the patient need). That means it is important to individualize each injecting pressure to fulfill proper depth to be achieved (seizing). But the current mass production system is difficult to accommodate such a requirement. However, more recently firms are experimenting with a tool kit approach where producers directly outsource innovation tasks to users themselves with significant reduction of the costs of gathering information on consumer preferences⁴⁴. Patients that innovate and wish to freely diffuse innovation-related information are able to do so cheaply in large part because of steady advances in internet distribution capabilities-DII.

Control placed on such infrastructure factors can threaten and maybe even totally disable distribution innovation systems. Therefore, in the near future, if a 3D Printer could be purchased by each home for general home use, it will be possible to configure or customize an injector for each individual (transforming). For example, a user can scale his or her own skin-tightness level using a measuring tool to be developed and send data to a manufacturer of needle-free injectors (an exogenous technological change that opens up the possibility of a new opportunity⁴⁵). Then the manufacturer produces 3D Data for the injector which makes proper depth injection possible. By using such data from the manufacturer, each user can create his or her own injector at home. If this process is established, it would no longer be necessary to deliver injectors and the need to manufacture them. Then perhaps only “drug and data” will be necessary in the future. Piller and Franke found that consumers are willing to pay a considerable price premium and further suggest that the toolkit’s ability to allow customers to customize products to suit their individual preferences creates value for them in a business-to-consumer (B2C) setting⁴⁶. In the future, 3-D bioprinters will allow patients to create their own organs and drugs through instant innovation, allowing the patients to make the cure that best fits his or her needs⁴⁷. This will lead to new modes of competition.

10 What is the Core Mechanism that Discriminates “Winner” from “Loser”?

STRATEGY: Carefully devise a plan of action to efficiently achieve a corporate goal while considering that efficiency as the attainment of maximum value with limited means^{48,49}. INJEX’s strategy is to develop its core competence “needle free” with patients, medical professionals and distributors. According to von Hippel,

innovation is being democratized. A reactive strategy exploits existing knowledge towards creating stability, consistency and minimizing variation. An innovative strategy uses an explorative approach in order to compete in production innovation⁵⁰, yielding disruptive innovation such as the NEEDLE FREE LANCET. Thus the diffusion process consists of a few individuals who first adopt an innovation then spread the word among their circle of acquaintances. Such a diffusion process of innovation typically takes a very long time.

Since the early Internet era in the 1990s, the use of new technology has spread beyond many imaginable ideas to now allow for experiments and implementations by just about anyone in just about any corner of the world⁵¹. By reframing the value of a new market such as the needle-free injector, the strategy for NPD in the differentiated market is flexibly changed due to weak ties. Because of worldwide distributions created in each country, INJEX's employees run their own race and invite everyone into INJEX's innovation process of co-evolution. This is done by exploring and exploiting to get the best ideas and technologies from others for the INJEX business model, and by letting others use INJEX innovations in each distributor business model. These innovations are based on tacit knowledge that is very difficult to copy and imitate. Because knowledge is an intangible asset that is difficult to acquire and copy, and the product of an extended learning process, it has to be considered as a much stronger source of potential competitive advantage.

Schumpeter argues that a dynamic process of "creative destruction" occurs when firms launch innovative actions to gain advantage in the marketplace, which is then eroded by their rivals' competitive moves⁵². However, if both the focal firm and rival firm have effective marketing campaigns, new demand could create a larger customer base which could have positive results for the focal firm by generating a positive sum notion. Pfizer innovated "Exubera" in 2006, spending more than one billion US\$ R & D expenses, however it was not successful because of lack of sales-high price. INJEX's TMT were concerned about this new product introduction by Pfizer. Heiner (1983) illustrated that by way of greater awareness in sensing strategic problems, heterogeneous teams can match complex competitive challenges and uncertain contexts with a requisite level of cognitive and experiences variety. Thus, heterogeneous top management teams are less likely to be constrained by selective awareness, which may give rise to a commitment to the behavioral status quo⁵³. However, they understand that a new product introduction will enhance market demand which could increase INJEX sales. These distributors and cosmetic professionals spend many years and resources to become an exclusive distributor, getting approval from the Ministry of Health, investing their own time and self-generated content, making it less likely to abandon INJEX. The winners in this new economic environment will be those firms that develop strong internal capabilities in a few areas and leverage

those capacities by enlisting the efforts of many others in support of their business⁵⁴.

Kawai analyzed the failure of Japanese companies, such as Panasonic, Sharp, and Sony, caused by the new DC (dynamic capability) framework. Strategy-changing capability and dynamic resource-reconfiguring capabilities are discussed. Samsung's success is in changing not only corporate and competitive strategies over time in response to environmental changes (i.e. mobilization of DSC) but also resource configuration changes in response to changing strategies (DRC). Japanese electronics makers failed because of their head-strong decision to sticking to the failed strategy of vertical integration and their failure to restructure their business model (DSC, DRC)⁵⁵. Ferrier suggested a firm's sequence of competitive actions is influenced by top management team heterogeneity, past performance, slack and industry characteristics⁵⁶. The author posits that catalyzing strategy making for growth or survival by Instant Innovation is the single most important task of top management team (TMT). The main reasons are: 1) the lack of DII (failure to create new radical innovations), 2) "the decision speed" of TMT explained by the Red Queen Effect, and 3) not taking survival strategy showed by the Maelstrom Effect.

INJEX succeeds by speedy linking different types of positive alliances to each distinct stage in the new product development process beginning with discovery and culminating in commercialization is one of many key successful factors. Understanding more fully the role of firms integrated along the entire new product development process seems particularly salient⁵⁷. This involves the following two key factors for success.

1) Vision/Design/speed: Needle Free, less painful, no bruising, easy to use, no stigma, no needle disposable issues and disposable, prefilled drug, less mistakes of drug injection, no risk of needle-sticks, and convenient and fast in emergency room/trauma center especially for elderly patients.

2) Accurate budgeting: Having a good product to sell is absolutely necessary for cash flow and "on target" budgeting. The first thing to consider in product development is defining MVP (the minimum viable product) and most importantly "will it sell?" What kind of product is the easiest to demonstrate to customers and interested investors? Those two objectives are usually obtainable for most start-up companies. The most common problem with start-ups is keeping costs low and having adequate profit to keep producing the MVP on a regular basis. It is important to have a product to sell to generate cash flow. So, the first objective on the product roadmap should be to define the MVP (survival strategy).

11 Speed

Decision speed has been long recognized as a critical determinant of firm performance, particularly in dynamic environment-under DII concept^{58,59,60}. The following examples illustrate this under hypercompetition.

- 1) Kodak versus Polaroid - As the companies competed head-to-head, both increased the speed of new product innovations coming to market. When Kodak introduced its instant camera, it could not gear up fast enough to meet demand and had to throttle back.
- 2) Cannon versus Kodak – Canon’s rapid introduction of new products kept it one step ahead of Kodak.
- 3) Sony versus Kodak – Sony’s rapid production and production innovations allowed it to arrive first to market. It launched a high-priced version to gain experience rather than wait for one with broad commercial appeal.
- 4) Seiko versus Swiss Watchmakers – The investment and traditions of the Swiss made, most of them slow to respond, even when it was clear quartz watches were a threat.
- 5) Pulsar versus Swiss Watchmakers – The rapid introduction of new technology such as LCDs and multifunction watches kept Pulsar ahead. The rapid development of the low-priced Hong Kong market rapidly destroyed the market.
- 6) Swatch versus Timex – Swatch process innovations allowed frequent new product changes.
- 7) The innovative product line of Apple, including both the iPhone and iPod, can be seen as instrumental in the survival and emergence of a stronger and more competitive corporation.
- 8) On the other hand, as the photography industry shifted to a digital focus, Eastman Kodak failed to move forward in creating innovative product offerings. The downfall of the corporation is largely attributed to that decision.

As these examples demonstrate, a strong connection exists between how companies go about developing products and services in the marketplace, and the ultimate success or failure of those companies. Accordingly, many seek to understand the evolution of such offerings and learn how to develop innovative products in an efficient and cost effective manner.

Examples for disruptive innovators (DII): iPod outplays Sony Walkman, Starbucks’s beans roasted their competition, Skype uses a strategy of “free” to beat AT&T, and eBay crushes classified ads. Southwest Airlines flies under the radar, Minimills took over 70% of steel production in the USA and led Bethlehem

Steel into bankruptcy, etc⁶¹.

Under hypercompetition environment, firms fight for market share, with for example, aggressive price and advertising competition, innovation first-mover advantages with quick response to competitive challenges, and competitive differentiation or with broad repertoires of such actions. Ferrier illustrates that research done by Lee, Smith, Grimm and Schomberg 2000, firms that responded quickly to new product introductions were found to have stock market returns superior to new product first mover and concluded aggressive competitive behavior is related to better organizational performance. He further states that moving quickly and aggressively is necessary to preemptively beat rivals⁶². Researchers in strategic management have yet to fully develop and test a dynamic process theory of competitive interaction. Future research needs to examine the sequential patterns of competitive moves carried out between competing firms unfolding over time and how such patterns relate to firm performance. Derfus et al. illustrated precisely through his research that its theoretical and empirical examination of Red Queen competition, conceived of as the positive and negative consequences of firm action on performance meaning firm actions can play out as a Red Queen race among rivals⁶³. The author posits that firm performance is influenced by dynamic instant innovation – speed. The aim was to capture how competitive aggressiveness influences speed. Firm performance and speed are influenced by several important internal and external forces and constraints.

12 The Red Queen Effect

General principle and mechanisms underlying the RQE

The term RQE was first used by the biologist van Valen in 1973⁶⁴. The metaphor comes from a passage from *Through the Looking Glass* by Lewis Carroll, the sequel to *Alice in Wonderland*. In the book, the Red Queen tells Alice: “Faster! Faster! And dragged her along. “Now, here, you see, it takes all the running you can do to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!”⁶⁵. This metaphor enabled Van Valen to explain certain biological behaviors and to analyze how species continually adapt to their environment to stay ahead of their competitors, which are also continually adapting. The choices, which the RQE offers, to species is simple: do nothing and be overtaken or fight to keep your position.

Derfus et al. explicitly modeled the Red Queen “running as fast as you can” process by examining the relationships among focal firm performance. They illustrated theoretically and empirically that focal firm

actions versus rival actions and speed of rival actions have two opposing effects on focal firm performance. They showed Red Queen theory is consistent with Schumpeter (1942) argument that a dynamic process of “creative destruction” occurs when firms launch innovative actions to gain advantage in the marketplace. As a result, the research clarified vital aspects of the competitive process, which includes the speed at which those rival actions occur, and to show the system’s effect on focal firm performance and firms that are more active than their rivals improve their competitive positions. They also illustrated that the rival position improves at the expense of the focal firm, showing in a study of Illinois banks from 1900 to 1992 per Barnett and Hansen. Ferrier quoted “creative destruction” of Schumpeter (1950), describing head-to-head rivalry between firms as “an incessant race to get or to keep ahead of one another⁶⁶, leading firms are relentlessly pursued by existing and unforeseen challenges that aggressively find new ways to satisfy customers (D’Aveni; 1994, Schumpeter 1950). So to stay ahead, leading firms must aggressively disrupt the routine pattern of rivalry “by creating new ways of doing things and new things to do”⁶⁷. He further illustrated 4 levels of analysis: 1) Individual action-reaction dyads, a link between action and performance over a finite time period. 2) The speed of execution, the better its profitability and market share. 3) Firms that carry out a broad, complex repertoire of actions experience better profitability and market share than firms that carry out a narrow, simple repertoire. 4) Firms that responded quickly to new product introductions were found to have stock market returns superior to new product first movers. These researches show that aggressive competitive behavior is related to better organizational performance. Finally he concluded that the four levels of analysis are influenced by top management heterogeneity, past performance, organizational slack, and industry context.

13 For DII, The author would like to use Metaphor of "A Descent into the Maelstrom" by Edgar Allan Poe as an example of survival strategy.

Here is the story:

The main character is an old fisherman and his two brothers. They have set out on a fishing boat and suddenly a powerful hurricane throws them off course and the younger brother is killed by the falling masts. The older brother and the old man know they have only about 15 minutes (hypercompetition) of calm before the hurricane pulls them into the eye of the storm and destroyed by the powerful whirlpool. The old man’s watch has stopped so they do not know how much time they have before drowning (uncertainty). They approach the eye of the storm (competitor). The fear is starting to possess them (sensing). Suddenly a determination to

survive over takes the old man's mind (seizing). The boat is now spinning around and around and is tipping to the center of the whirlpool (running fast and going nowhere). The old man observed that a round water barrel that fell out of the boat remained afloat (Instant discovery-innovation). He was able to tie himself to the barrel and went into the water (formulating-survival strategy). The old man stayed afloat for several hours until another fishing boat rescued him⁶⁸.

This story illustrates a survival strategy of an old man that was quick to adopt and execute to survive. Tragically the surviving brother stayed in the boat (competency trap?) and was pulled into the watery abyss. As the men turned back towards Lofoden Point, a huge wind swarms upon the boat, throwing it off course and tearing out both of its masts while spectacular clouds flew rapidly across the sky. The old man's younger brother died when the masts were torn off, since he had mistakenly tied himself to one of them for safety, thinking that it would prevent him from being swept overboard. Suppose we place this situation into our competitive environment in the industry, the huge wind represents hypercompetition among firms. The old man's young brother is a competitor and went out of business. The elder brother clung to the boat, and they both stare in awe as both the water and sky rage around them, even as they both react violently upon realizing that the Maelstrom is reaching full force again, with the fifteen minutes of calm having expired. With hypercompetition, decision speed is very critical by top senior management teams. They were powerless to navigate, due to the heavy winds and their dismembered boat, and even as the hurricane settled down abruptly, it is too late to avoid being pulled into the dreaded Maelstrom, slow business and declining. As the old man gazed at his watch to check for the time, he realized that he had forgotten to wind it! Enraged, he hurled it into the ocean as the boat drifted into those circular currents, daunted by a sudden hole in the cloudy sky revealing "the full moon with a luster that I never before knew her to wear. The ship turned sideways, with its right side overlooking the deep abyss at the center of the Maelstrom, slowly traveling in the water's current"⁶⁹.

14 Limitations and Future Research

Additional theory and research are needed to improve understanding of the Red Queen competition and Maelstrom's survival strategy. Future research will be able to develop this concept addressing speed which is left behind in this study (PLM, BIM and DMU). Another limitation of this paper is that only one method, the case study method, is used for analyzing the data. Furthermore the results from this study cannot be generalized beyond the firm that was analyzed. Future research should triangulate the methodology of

collecting and analyzing data. For example, content analysis of documents from the firm can be conducted to verify the observations and findings from the case study method.

15 Conclusion

This paper introduces the new concept of instantaneous competitive advantages under hypercompetition. For example, when the speed of implementation supersedes the speed of competitive response from rivals, DII creates instantaneous competitive advantages. Derfus concluded in his paper (The Red Queen Effect) that its theoretical and empirical examination of Red Queen competition was conceived of as the positive and negative consequences of firm action on performance. The research shows that firm actions can play out as a Red Queen race among rivals having a positive impact on focal firm performance⁷⁰.

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