should protection or prohibition be? Evidently, such issues fall under the umbrella of the design of intellectual property laws and policies.

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Mastering the Hype Cycle: How to Choose the Right Innovation at the Right Time, Jackie Fenn & Mark Raskino, Harvard Business Press (2008), 237 pages, ISBN: 9781422121108

Prologue

Theories on macroeconomic adoption of new technology and innovative products have evolved over time. A linear model theory evolved into Kleine & Rosenberg's chain-link model, or interaction model, in 1986, while the innovation model was developed from a static to a dynamic model by Utterback and Abernathy in 1975. In 1994, Utterback conducted an in-depth analysis of competition strategies and innovative behavior, and compiled technology innovation theories and practices into a book, *Mastering the Dynamics of Innovation* published by Harvard Business School. And in 2008, Harvard Business School published *Mastering the Hype Cycle*, the title of which seems to be mimicking that of Utterback's book. *Mastering the Hype Cycle* argues that the existing technology life cycle model ought to be changed to the "hype cycle," as the model of innovative technology adoption has evolved from a linear to an interaction model and from a static to a dynamic model.

Mastering the Hype Cycle is composed of two main parts: Part I explains what the hype cycle is, how it works, and why it works that way, traps and opportunities; and Part II explains to managers and innovative leaders the STREET innovation adoption

process through which the hype cycle leads to rational decision making regarding adoption. Thus, Part I can be interesting to general readers who have interest in investment as well as policy and technology management experts, while Part II contains important messages for managers and policy makers who make decisions about innovation adoption. The hype cycle, the concept that lies at the heart of the book, is much different from the existing innovation adoption cycle models in that it considers not only innovation and technology but also the nature of human. In order not to fall into the pitfalls of the hype cycle, people first need to have a good understanding of the cycle and then need to employ a highly sophisticated decision making process regarding the adoption of the innovation. The book provides both. This review will first take a look at the theoretical background and origin of the hype cycle model, then on the definition and main properties of the hype cycle and STREEP process, followed by discussions of implications and conclusions.

The Beginning of the Hype Cycle

Jackie Fenn, the author of the book and originator of the hype cycle model, had been working on the analysis of emerging technologies in the IT industry at the famous IT research and advisory firm Gartner, since 1994. As she provided support for the technology planning activities of large companies and governments (public institutions), she was able to understand the reality of emerging technologies and the hype surrounding them. Through analyzing emerging technologies such as AI (artificial intelligence), VOD (video on demand) and WWW (World Wide Web), she saw enormous potential of these technologies, but realized that numerous challenges lay ahead before such technologies could become an everyday reality.

Building on her experiences analyzing emerging technologies, she decided to write a research paper on patterns, which might not necessarily be applicable to all technologies but to most of them. She saw the market's initial enthusiastic response to emerging technologies, the following disappointments as those technologies faced challenges in reality, and the gradual understanding of real benefits from
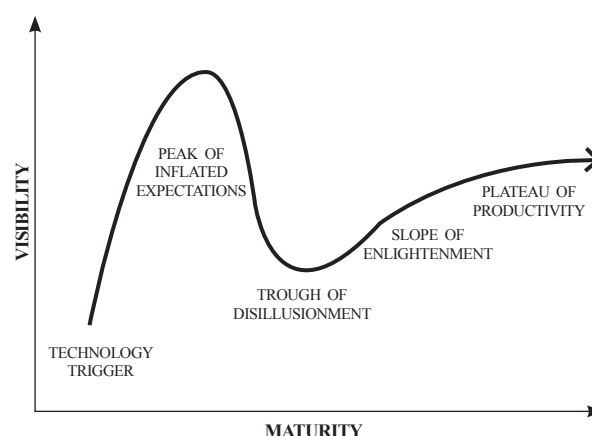
technologies. She drew a diagram of such a cycle, which was later publicly known as the hype cycle after being introduced in *When to Leap on the Hype Cycle* in January 1995.

When Gartner first introduced the hype cycle, particular technologies were illustrated, and the hype cycle was used with the purpose of giving a lesson of "buyer beware," meaning that one should beware the words of business people seeking to promote products. However, as more and more readers asked for more details about the hype cycle, Gartner and Fenn realized the explanatory power of the hype cycle. Thus, an analytical report on the hype cycle became a flagship report from Gartner and began to be offered in the form of an annual report covering major emerging technologies in the IT industry.

A number of theories have influenced Gartner's process of developing the hype cycle. Among classical theories, Nikolai Kondratiev's "long waves" and Joseph Schumpeter's "creative destruction" have had significant impact on the idea of a recurring cycle of radical innovation, and thus on the development of the hype cycle. Among relatively modern theories, Rogers' "diffusion of innovations" model, the predictable "S-curve" models and Moore's "Crossing the Chasm" and Roy Amara & Paul Saffo's "Macro-Myopia" concept have had great influence on the development process of the hype cycle. Created under the influences of the above-mentioned previous research models, the hype model stands out from other models in that it explains challenges facing acceptance of innovation during initial stages of an innovation's life cycle.

Understanding the Hype Cycle

As Rogers explained, the technology adoption cycle is represented in the S-curve in which the rate of adoption soars as the cycle moves from innovators to early adopters and to mainstream adopters and then begins to stagnate and fall.[1] The rate of adoption is proportional to market size, reflecting the growth trends in the market fairly precisely. However, the author, Fenn, discovered a flaw in the classic life cycle model, and realized that many technology

Figure 1 Hype Cycles of Innovation (p. 9)

companies fail to find the right timing for market entry because of the flaw, which is derived from a fallacy in decision making. That fallacy is the belief that rate of technology adoption is proportional to market expectation (or visiablity) in a technology, rather than to market size. When market expectation in a technology reaches a peak, companies tend to hastily barge into the market. When market expectation withers away, companies think the market has matured and the technology has lost its competitive value. They pay little attention to that technology and make a mistake of giving the lead to competitors at the stage of full-fledged growth. Therefore, in Figure 1, "Hype Cycle," Gartner demonstrated the fact that market expectation is one thing but technology adoption is another.

As shown in Figure 1, the "Hype cycle" shows market interest, visibility or expectation, and in particular it shows that there is a bubble of expectation where market interest and expectations skyrocket in the very early stages of the market. When the market is matured to some extent, market expectation begins to wane. Market expectation becomes an indicator showing consumer interest and expectations about a new product, or the exposure of the product in the media, or consumer requests for the product to vendors.

In general, the technology hype cycle model is used to explain the process of introducing a new product

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1) Refer to Book Reviews: Diffusion of Innovation in *Asian Research Policy* Vol. 1 Issue 2

in the market, how market expectations are changed over time, how the product takes root in the market, and how the product is being utilized by companies. Figure 1 shows the following five stages of the hype cycle.

- *Technology Trigger:* This is the stage in which a new product arises out of a new technology. *In this stage, the media starts to show interest and expectations about the product, but often the product seems to lack market value or the potential of commercialization.*
- *Peak of Inflated Expectations:* This is the stage in which several success stories regarding the new product are shared, but not many companies are actually involved in the market. It is a period of heightened expectation. The media make unrealistic and overly optimistic reports on the success of technological advance. This period of bubble may last for several months or even several years when decision making on technology adoption and investment of companies requires a long period of time.
- *Trough of Disillusionment:* This is the stage in which market expectation begins to fall sharply because of unpromising experiment results or the failure of commercialization efforts. In order to secure sustainable investment in technology, companies need to provide a product that can satisfy early adopters' needs. It is a realistic re-adjustment period drawing a rapidly falling curve, so the media's interest wanes and the media become skeptical of technology's market value.
- *Slope of Enlightenment:* This is the stage in which there is a comprehensive understanding of how a new technology can generate profits in the market. In this stage, second-generation and third-generation products with enhanced features begin
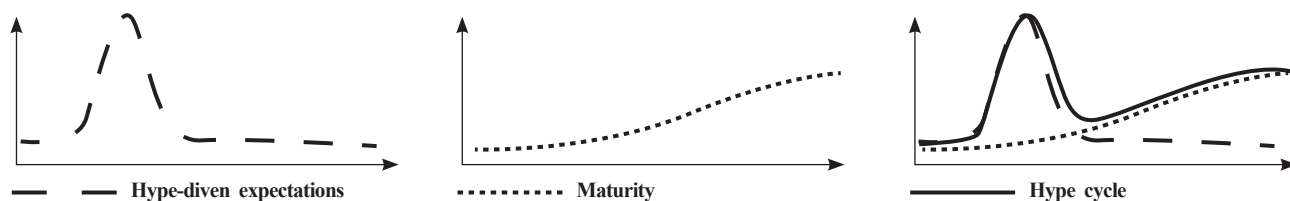
to emerge on the market. Conservative companies are still on the fence and are observing how successful players perform in the market.
- *Plateau of Productivity:* This is the stage in which the product is widely recognized as useful and marketable. The size of the market becomes larger at this stage.

According to the authors, the hype cycle is nothing new, but is important because the cycle is recurring due to people's imagination. The hype cycle represents a phenomenon that is present everywhere. It is quite different from the existing cycle models. The hype cycle takes into account customers' emotional responses while the existing cycle models, which are based on a theoretical and idealistic approach, assume that customers make logical and rational decisions in the market. As people's expectations about the value of an innovation explode, a renaissance period arises, people become emotionally connected with the idea of adoption, and innovation begins to be adopted by an increasing number of customers. However, when customers' expectations collide with reality, the hype begins to subside.

The hype cycle phenomenon is caused by two factors: the human nature and the nature of innovation. The nature of innovation essentially creates a new and genuine value while the human nature causes exponential expectations about such value creation. Furthermore, there is a time difference between the two processes that ensue from the two natures. As shown in Figure 2, people's expectations rise fast but fall fast too. On the contrary, technology innovation happens slowly and gradually. The following two curves of hype-driven expectations and maturity are in stark contrast to each other, and analyzing these two curves results in the hype cycle.

Gartner has been utilizing the hype cycle model

Figure 2 Components of the Hype Cycle (p. 27)

and paying a lot of attention to the cycle right before the rate of adoption becomes 20%—because the stages of peak of inflated expectations, trough of disillusionment, and plateau of productivity all take place at that point. The key implications of the hype cycle are derived from the stages of the peak of inflated expectations and the trough of disillusionment: It gives a valuable lesson that companies should not just barge into business because other companies are doing it, during the peak stage of inflated expectations, and should not neglect their innovations just because people lose interest in the new technology during the trough stage of disillusionment. Such valuable lessons for companies are summarized and further developed into a strategic frame for innovation: the STREET process.

Understanding the STREET Process

Having studied the hype cycle for over a decade, authors looked into why some companies succeed with innovation while others fail. They summarized their research results on best practices encompassing companies, industries and environments, and suggested the STREET process as a strategic frame. The STREET process explains ways to select the right innovation at the right time and several preparation processes for corporate innovation but deliberately omits these processes after development and rollout because they require more business techniques than innovation and utilization of technology. In other words, the STREET process is focused on the period in which a decision is made to adopt innovation until a "transfer" stage where innovation becomes widely accepted and embraced in the society.

The STREET process is composed of six stages: scope, track, rank, evaluate, evangelize and transfer. Gartner first introduced four stages of specification, tracking, evaluation and production in 1994, and added two more stages in 2003. The meaning of each stage and relationship between each stage and the hype cycle are defined as follows:

- *Scope Stage:* This is the stage for "establishing the context the innovation" in which a company determines what creates more value and how much risk it is willing to take to obtain value. This stage offers the focus and context for investment in innovation and the context for struggling against temptations of early adoption. At the scope stage, the company seeks to understand opportunities, mission, objectives, strategies, needs and values. It also determines how much it will invest in the creation of an innovative product.
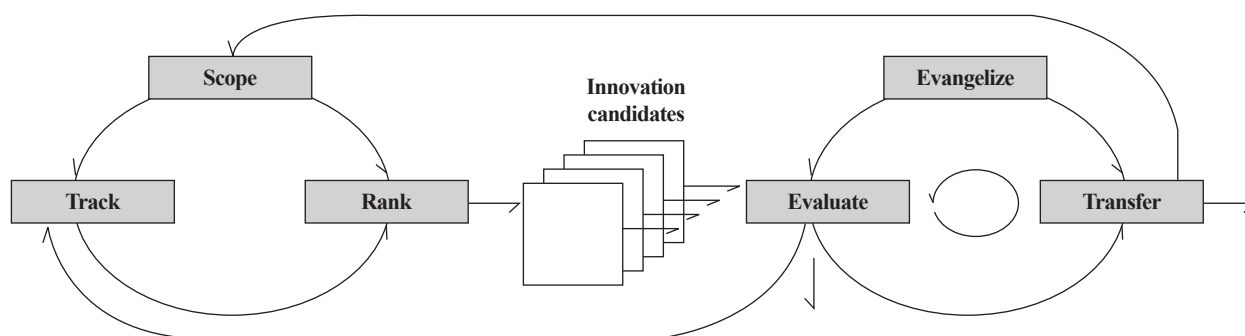- *Track Stage:* This is the stage for "collecting the innovation candidates" in which a company discovers adequate innovation sources and predicts the level of market maturity based on the hype cycle. The purpose of this stage is to collect innovation candidates who fall under the company's scope and make sure their risks come under a safe range. The track stage enables the company to become more proactive and take the lead in collecting qualified candidates to carry out the innovation agenda.
- *Rank Stage:* This is the stage for "prioritizing the candidates" where a company ranks potential innovation candidates and selects candidates with higher priority. The purpose of this stage is to determine innovative ideas that fit the company's risk profile and have the potential to earn significant profits during a given time period. Ranking innovations is an important stage in that it will help the company compare various options with limited investment sources while avoiding making overly simple evaluations of benefits from innovation. Making overly simple evaluations at this stage lowers the sophistication of evaluations during the peak stage of inflated expectation. Albeit essential, this stage is often neglected when adopting innovations.
- *Evaluate Stage:* This is the stage for "understanding rewards and risks," where a company investigates innovation candidates with higher priority. Companies still lack knowledge and understanding of innovation and may not make a decision on adoption. At this stage, prototyping, piloting, laboratory experiments, and documentary research are carried out to evaluate the gap between the expected value and the actual value of innovation. The hype cycle can be used at this stage to consider the speed of development at each stage

of the cycle and select the optimal period for adoption of the innovation. The result of this stage will be one of the following four processes: First, the company can proceed to the "evangelize" and "transfer" stages. Second, the company can conduct reevaluations in a modified form. Third, the company can wait for a while until innovation candidates become more mature. Fourth, the company can give up entirely on innovations.

- *Evangelize Stage:* This is the stage for "evangelizing selected innovations" where a company inspires innovations, conducts education, and involves other people in the company. At this stage, the company should induce support from multiple stakeholders who can affect the adoption of innovation by end-users. The company needs to inspire enthusiasm so that key decision makers can discover the true value of innovations and thus overcome resistance within the organization. In doing so, people need to either use or overcome the emotional effects of hype. For instance, people should be encouraged to have realistic expectations during the renaissance period and focus more on future profit in the trough of disillusionment.

- *Transfer Stage:* At this stage, people interested in the adoption of an innovation still need to inspire, educate and involve others in order to transfer responsibility required to implement an innovation. There is a greater chance of success when the company transfers more than simple knowledge. Thus, those who are involved in the previous

stages, especially those who participated in the stages prior to the evaluation stage, should lead this stage.

Looking at the above explanations on each stage, the STREET process might seem as a series of simple and distinct processes. However, the processes can be conducted consecutively and in many different directions. Figure 3 shows the principal flow and interaction of the STREET process. "Scope" activities help accumulate knowledge for various innovations in preparation of "track" activities. In particular, the track stage is the most active and capital-intensive stage among the first three stages. "Track" activities are conducted regularly by many organizations and scan the latest trends and technologies, whereas "scope" activities are not conducted as often. Sometimes, disruptive innovations or so-called "game changer" innovations can be excluded from the company's current scope activities. Therefore, such disruptive innovations cannot be found in the track activities and can proceed to the scope stage, as in Figure 3. Innovation candidates that are selected at the track stage are ranked at the rank stage, and the scope of an institution has effects on the ranking. The final third stage of the STREET Process located on the right side of Figure 3 is implemented by innovation candidates selected at the rank stage. Four arrows emanating from the evaluate stage stand for the four stages of transfer, reevaluate, return to track, and drop. As mentioned earlier, even after the evaluate stage, innovation needs to go through the "evangelize" and "transfer" stages before re-entering the evaluate stage.

Figure 3 STREET Process for Innovation Adoption (p. 99)

Conclusion

Recently, quite a few analyses and their results based on the hype cycle are seen, because Gartner and many other institutions and experts, especially in Korea, use it to explain technology prediction and adoption. Google's research statistics show that Seoul is the region (or city) with the highest interest in the phrase "hype cycle."[2] When utilizing the hype cycle model, companies first need to build an accurate understanding of various explanations of the hype cycle and in-depth considerations of strategic utilization methods. In this sense, *Mastering the Hype Cycle* makes a great contribution.

The book contains comprehensive knowledge of the hype cycle, including practical insights, which is a major step forward from previous Gartner reports or analyses. Thus, *Mastering the Hype Cycle can* be of great help to those in charge of planning, analysis of technology, and policy making regarding investment in R&D and production at the right time. People might be fooled by their emotional responses to new innovations and make hasty decisions on investment or withdrawal of investment efforts; therefore, the STREET process can help people better understand the hype cycle and make more adequate decisions on the adoption of innovation.

As mentioned in the early theoretical background section, the hype cycle is a model based on experiences influenced by several existing innovation theories as well as social and psychological theories. Thus, like other models, it may not be entirely new. Nevertheless, it explains technology innovation adoption behaviors in the market in many cases, which is an obvious advantage. The STREET process is also similar to Rogers' innovation-decision process because it involves knowledge, persuasion, decision, implementation and confirmation, but, unlike Rogers' model, the STREET process is explained in relation to the hype cycle and is more systematic than Rogers' process.

There are two new and major concepts of the hype cycle and STREET process explored in *Mastering the Hype Cycle*: a new variable of market expectations (or visibility), and the gap between the market's emotional response and rational response. These two concepts can be important considerations when making decisions. Therefore, this book is expected to provide useful insights and concrete action plans for decision makers.

Lastly, there is an important problem that remains unresolved regarding the hype cycle. According to *Mastering the Hype Cycle*, the type of hype cycle can be diverse in shape and period, and it is difficult even for experts to figure out which stage a technology is at. For all the insights gained from reading *Mastering the Hype Cycle*, the failure to suggest criteria necessary to determine which stage a technology is at leaves room for further research and improvement of the model.

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2) Google's search traffic statistics can be used to analyze users' interest. "Search traffic" means the percentage of the relevant search keyword out of the total numbers of search terms.