Introduction to Breakthrough Thinking

Prof. Shozo Hibino*, Ph.D.

(Abstract: This paper is a practical short research note on Breakthrough Thinking. This Breakthrough Thinking is keen for creative efforts in management. This paper will provide a new thinking paradigm for creative activities. This new thinking paradigm is called Breakthrough Thinking[1], proposed by Shozo Hibino and Gerald Nadler in 1990.)

Key Word: Breakthrough Thinking, Theory of Bypass, Development, Creativity

Introduction:

There is a famous golden word, "Don't give fishes, but teach how to fishes". Most advanced countries give a lot of fishes and most consultants provide only fishes, never teach how to fish. As you understand, this fish means solution, money and any help. For example, advanced countries have provided many successful cases and financial aids (fishes) to developing countries and most consultants provided the success stories and solutions to their clients.

We never deny these kinds of activities by advanced countries. However, there is a following big problem in such a "fish assistant behavior" from view point of developing countries and companies. This fish assistant behavior will create beggars. We don't know how to fishes. So that we have to ask continuously fishes. We will be a beggar and beg "give me more fishes (more assistances and solutions). We lost our thinking power, that is, our brain. It is good for the advanced countries and consultants to be asked. However, we will become followers and slaveries of the advanced countries and consultants. If we say "No", they say "Sanction". From the view point of advanced countries, Yes, good!! From the view point of developing countries, No, very bad!!

We have to know how to fish and how to create solutions definitely.

- Dr. Shozo Hibino is Professor, Graduate School of Sociology, Chukyo University, and Toyota, Japan. He is also a visiting professor of Japan International Corporation Agency, Association for Overseas Technical Scholarship. He is a founder of Breakthrough Thinking and consulted it in many companies, such as Toyota, Canon, Mitsubishi, NEC, Fuji Xerox, and TOTO, and many small & medium companies, Government organizations, etc. in Japan and in the world.

Conventional Approach is out of date for finding solutions:

There are two approaches to find solutions[2]. One is a conventional approach, called "Analytical Approach", based on Descartes Thinking paradigm. Another is a recent new approach, called "Design Approach", based on Breakthrough Thinking paradigm.

We have been using the analytical approach for finding solutions. We will visit an advanced country and learn from past and present successful cases there. We try to introduce the successful cases (fishes) to the different context in developing country with a great effort and will finally loose our creative thinking power.

In 21st century, our world became a global village by advanced technologies. We are facing drastic changes in not only business world, but also any field.

Since there is no future on the same line of the past in such a drastic change age, we have to realize that the conventional approach could not be effective any more. We could not make solutions, based on the present and the past cases. For example, we can not plan the tell communication system based on conventional wired system in Japan. Even if we build a new wired tell communication system, the system will be out of date quickly.

Another important deficit of the conventional analytical approach is the following facts;

1) While we are analyzing and/or studying the present situation, our competitors will advance more. We can not catch up them. We will be always a follower.
2) We will loose creative mind and thinking power because the cases affect our mind.
3) By introducing the successful cases from advanced countries, we will also introduce the serious aspects, such as environmental pollution.

Our university education and training approach should be changed, because they are mostly teaching a conventional approach, which is any more effective and out of date in such a drastic change age.

New Approach for finding solutions

A New approach is "Design Approach", which means "Design an ideal future solution and learn from the ideal future solution". There are two approaches to design the future. One is conventional approach, which means "Analyze the past and present, and design the future based on the past and present". This is dangerous because there is no future on the same line of the past.

The New Design Approach is a substance-base design approach. Without referring the present or successful cases, we try to think the substance (purposes) of the solution and create the ideal solution, called "Solution-After-Next" for the substance (purpose). Then we will try to find the real solution based on the Solution-After-Next. In this approach, we will learn from the future substantial ideal solution, not learn the past & present successful cases. For example, Mr.Kiichiro Toyoda, a founder of Toyota Motor, tried to think the real substance (purpose) of the belt conveyor, shown by Mr. Ford, without introducing it directly. He could find the purpose of the belt conveyor is not to produce parts as many as possible, but to cruise or produce parts in just-in-time. This purpose created the innovative production system, called "Toyota Production

System", which was completely different from Ford Production System. Toyota Production System has bypassed the Ford Motor Production System at this point. Many automobile manufacturing companies have studied Toyota Production System.

New Thinking Paradigm for bypassing

The New Design Approach is only way to bypass the advanced countries and companies, because this approach never copy or import the successful cases and is a substance-base-thinking.

Philosophically this new design approach is backed up by Breakthrough Thinking Paradigm proposed by Shozo Hibino & Gerald Nadler, different from the conventional Descartes Thinking Paradigm. The Descartes Thinking Paradigm originated form Rune Descartes in 16 century and has 400 years history. This is based on machine theory, fact-centrism. This Descartes Thinking Paradigm is effective for finding facts in science field. However, this paradigm is now facing the difficulties in finding solutions for the drastic changing and organic world. We are now at the edge of shifting our thinking paradigm for finding solutions from Descartes Thinking to Breakthrough Thinking.

Breakthrough Thinking is based on the epistemology of system view, which means organic view, purpose oriented, and interdependent, holistic view, completely different from the conventional Descartes Thinking paradigm.

Breakthrough Thinking is composed by following seven assumptions based on this system view.

Assumption 1: Uniqueness
Assumption 2: Purpose
Assumption 3: Solution-After-Next
Assumption 4: Systems
Assumption 5: Limited information collection
Assumption 6: Involving People or People Design
Assumption 7: Betterment Timeline

The seven assumptions of this new thinking paradigm are also very different from the conventional assumptions. It is quite important to know these differences for finding solutions. Let's discuss these differences one by one.

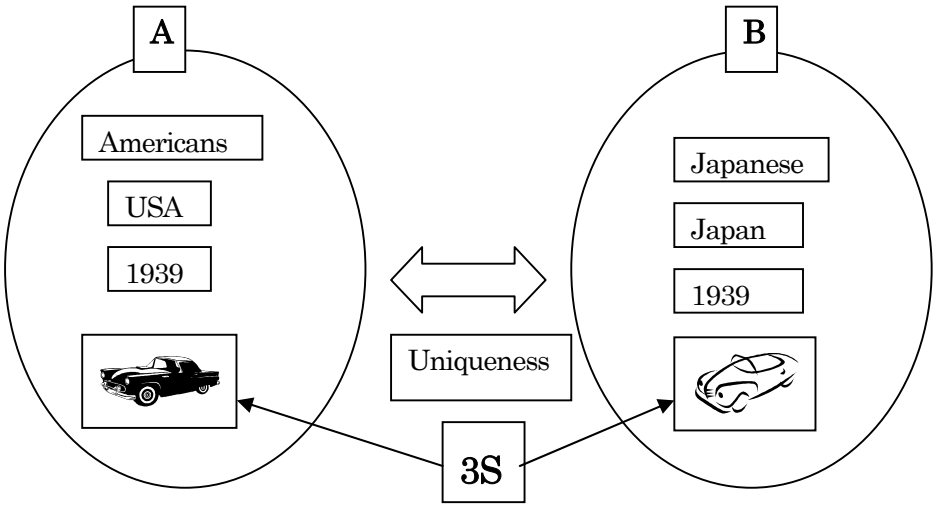
Assumption 1: Uniqueness

Assume initially that the problem or opportunity you now confront is different from all others. Do not initially copy existing solutions.

*** Conventional assumption:** Copy the successful cases or learn from the advanced cases. Learn from Ford, GM and Toyota, Japan, USA.

*** Case:** Toyota never imitated Ford Production System, because she thought Toyota and Ford were completely different in size and culture at her initial stage.

Fig.1 Uniqueness / 3S (Situation-Specific-Solution)



In fact finding approach by Descartes Thinking, we will seek the commonality. However, in solution finding approach by Breakthrough Thinking, we must seek the uniqueness for the solution locus. The locus has three major factors, human viewpoint (who?), physical view (Where?) and time view (When?). Once you decided this locus, you may find unique differences between A and B, shown in Fig.1. For example, Ford's customers in USA in 1930's were completely different from Toyota's customers in Japan in 1930's. People were different. The culture was different. The richness was different. The road conditions were different. The temperature was different. So Toyota should produce the Situation Specific Solution (3S cars) for Japanese customers. Without deciding this locus, you can not find any difference and will think the commonality for a world car, which means the unsatisfied car for everybody and anywhere.
.One of the key factors of bypassing is locus focused thinking for finding 3S.

Assumption 2: Purposes

Explore and expand the purposes, in order to find the substance. The substantial purpose is the base for thinking.

*** Conventional assumption:** Analyze the past and present and find out facts or problems. The facts or problems are the base for thinking.

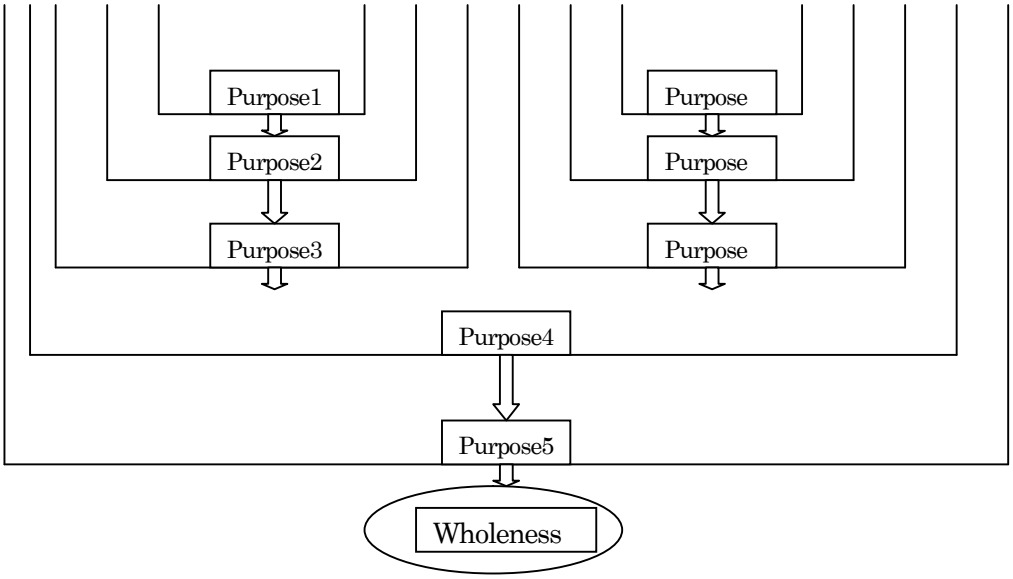
*** Case:** Toyota started to think the purpose of the belt convey and developed Toyota Production System, completely opposite system from the Ford Belt Conveyor。

The substance (purpose) will change depend on the locus, in Breakthrough Thinking, although the substance (fact) never changes in Descartes Thinking world. The purpose of chocolate in valentine day for her is to transfer her will. However, the purpose of the same chocolate in the

cold weather at the mountain for you is to provide energy. So uniqueness assumption, that is, the locus setting is quite important for finding substance.

Another important assumption for finding substance is to expand purposes in stead of analyzing the present situation. This is based on the Chinese box epistemology, which means "everything is a system and everything is a Chinese box". This Chinese box means that a large box includes small boxes and a small box includes smaller boxes and so on, shown in Fig.2. Everything is organized like this Chinese box. For example, a company has three divisions and one division has five departments and so on. Everybody knows about this. However, nobody knows the important meaning of expanding purposes. Every box has a purpose, because every box is a system. If you ask "What is the purpose of the purpose1?" "The answer is the purpose2" "What is the purpose of the purpose2?" "It is the purpose3" and so on. Please continuously ask the purpose of the purpose. Finally we can attain the biggest box, which is the wholeness of the world. Now we can find how to think holistically. We named it as "Purpose Expansion". This purpose expansion technique is a very powerful tool to find the wholeness and the substance of the world.

Fig.2 Chinese Box Concept



Let's expand the purposes of the belt conveyor for Toyota in 1930's. What is the purpose of the belt conveyor? It is to move parts from A to B. What is the purpose of this purpose? It is to transfer assembly parts from A to B. What is the purpose of this purpose? It is to provide assembly parts (in just in time and no inventory). What is the purpose of this purpose? It is to produce cars (in just in time and no inventory). What is the purpose of this purpose? It is to provide cars (in just in time). What is the purpose of this purpose? It is to provide transportation.

Mr. Kiichiro Toyoda thought like this. He realized that the purpose of the belt conveyor was not to produce parts as many as possible like Ford Motor at the age of mass production in USA, but to produce cars in just in time and no inventory as requested by the customers in Japan, since he knew the unique Japanese situation in 1930's. Japan was a developing countries and USA was already advanced country in 1930's. Mr. Kiichiro Toyoda never imitated or introduced Ford Production System.

One of the key factors of bypassing is purpose expansion.

Solution-After-Next

Develop many options of "ideal" solutions for the substantial purpose or purpose-base solutions. Utilize the absolute benchmark (no time, no cost, zero defect, etc.)

*** Conventional assumption:** Think a solution for the present problem and situation. Utilize the relative benchmark (competitor's figures).

*** Case:** Toyota has utilized the absolute bench mark. For example, when she created Toyota Production System, she said the ideal production was "just in time and no inventory (Zero)"

Fig.3 Solution-After-Next and Absolute Bench Mark

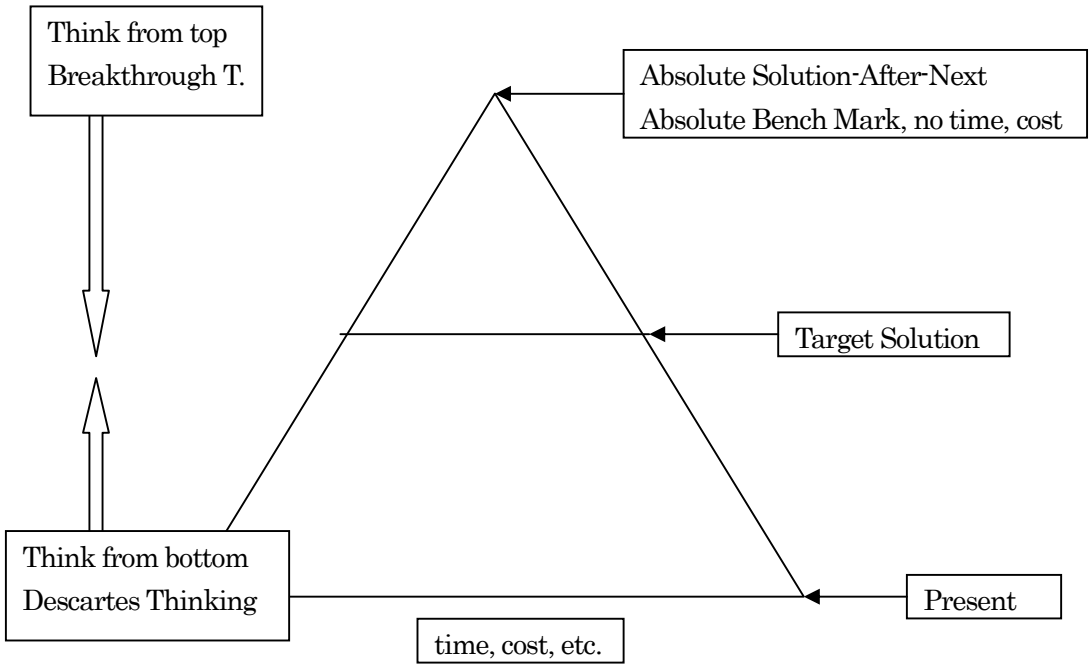


Fig. 3 shows an image of Solution-After-Next. The width of a triangle indicates any measures such as cost, time, and number of defect. A wider width means a less efficient solution. The best solution or ideal solution locates at the top of triangle, which means zero time, zero space and no defect. The bottom line is the present situation.

In conventional thinking, we analyze the present situation and find out problems. Then we try to think solutions for the problems and replace them for solving problems towards better

situation. We think solutions from the bottom, based on the present situation and present problems. However, in new thinking, we try to think absolute ideal solutions (absolute bench mark), based on the focus purposes and the future. Then we try to think a realistic solution, based on this ideal solution target.

Mr. Kiichiro Toyoda thought we had to accomplish the just-in-time and no inventory production system, in stead of copying the Ford production system and Mr. Taichi Ohno, his subordinate, invented the Toyota Production System, by introducing Super Market System concept to production system. Toyota utilized absolute bench mark and learned from ideal solutions.

This absolute bench mark strategy is quite effective in such a drastic changing age.

1) You don't need to survey the competitor's bench mark analyze competitor.
2) So that you can save your money and time. This time is critical because of competition age.
3) This approach pushes you to utilize a different thinking creatively. You can bypass your competitors by using different thinking.

One of the key factors of bypassing is to utilize the absolute bench mark and learn from future.

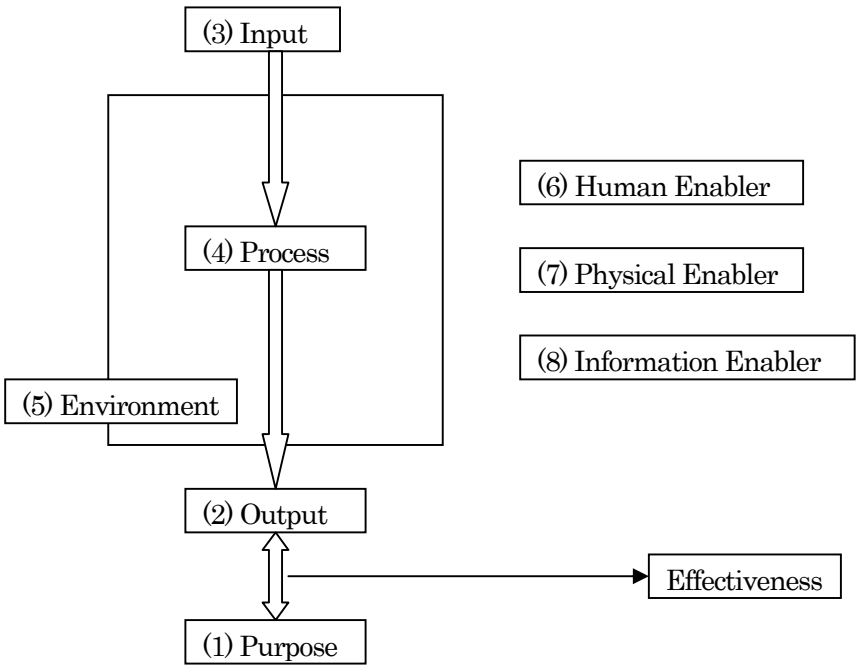
Systems

Everything is a system. Everything has purposes, inter-relation and holistic view.

*** Conventional assumption:** Everything is a machine. Everything is divided into parts. The parts can be replaced. The sum of the parts is the whole.

*** Case:** Toyota introduced "Work Design", which is the origin of Breakthrough Thinking, especially this 'Systems Principle' in 1963.

Fig.4 System Model



As shown in Fig.4, a system has at least eight elements; purpose, output, input, process, environment, human, physical and information enablers. For examples, a car assembly line has the following 8 elements.

1) Purpose: to assembly parts
2) Output: assembled cars
3) Input: parts
4) Process: assembly process
5) Environment: factory temperature, humidity, culture
6) Human enabler: workers
7) Physical enablers: machines, tools, equipments, buildings.
8) Information enablers: assembly manual, computer software

In conventional thinking, we don't have this system model. So we can not get rid of restricted solution space. By this system model, we can expand our solution space for bypassing. For example, Mitsubishi Electric Corp. expanded the input to upper stream and the output to down stream, and established the Supply Chain Management System by connecting the processes from upper to down stream with Information Technology and got Grand Prix Award from the Japan Logistic Association, without studying Supply Chain Management[3].

Many people talk about efficiency and effectiveness. However, these two words are not clearly defined. By this system model, we can define an efficiency and effectiveness clearly. Efficiency means Input/Output and effectiveness means purpose/output relation. In new thinking paradigm, we can think effectively because we expand and focus on purposes and find solutions for focused purposes.

Furthermore, we have to think not only 8 elements, but also following 6 dimensions:

1) Fundamental Dimension: 8 elements
2) Values Dimension: Good or Bad for 8elements.
3) Measures Dimension: How to measure values for 8 elements.
4) Control Dimension: How to control the quality for 8 elements.
5) Interface Dimension: Inter-relationship among others for 8 elements.
6) Future Dimension: Futures for 8 elements

For example, we have to control inputs to assembly line and need shipment testing from the assembly line for quality goods. We need QC on the assembly line. We need temperature and humid control in the factory. We need labor, equipment and information control for the assembly line, and so on. In order to control, we need quality standards or measures for QC. These measures come from values dimension. We have to think the cooperation with other lines, organizations and governments; we have to think the 8 elements in the future and prepare them now.

The matrix of 8 elements and 6 dimensions is called System Matrix, shown in Fig.5. This matrix is powerful tool for implementation. A row of this matrix is also a system matrix and a column is a system matrix. One cell is also a system matrix. For example, an arriving system, which is the input cell of the production line, has 8 elements and 6 dimensions and so on. So we

can think from huge system to micro system by this system matrix.

Fig.5 System Matrix or Solution Matrix

	Fundamental	values	Measures	Control	Interface	Future
Purpose						
Output						
Input						
Process			**Cell**			
Environment						
Human enabler						
Physical enabler						
Information enabler						

In order to implement our ideas or concepts, we have to think details of the concept or a lot of subsystems. Many developing companies and country people talk a lot, without implements, because they don't have this systems thinking. Toyota is excellent in building systems, especially "Shikumi", which can drive the solution. An excellent example is "Kamban" in Toyota Production Systems.

From this system matrix, we need a lot of actions for bypassing, not only restructuring our labor forces or money investment, but also we have to think processes, inputs, outputs, enablers, control, interface, futures, etc.

One of the key factors for bypassing is to think details of solutions by System Matrix for implementation.

Solution Finding Information Collection

Collect information/knowledge that is essential to the solution. Clarify your purposes before collecting information/knowledge.

*** Conventional assumption:** Collect all the information/data for finding problems as much as possible.

*** Case:** Toyota has produced and tested many car models, based on new concepts, without collecting useless information.

Mr. Souichirou Honda, founder of Honda Motor Corporation, told an interviewer; an engineer handed me a report on a study of the performance of an assembly line. I told him: "We can not understand what is going on by just looking. It is not bad to measure it. However, you have to think of the purposes of collecting data." I would like to point out the danger of data gathering; (1) Data/Information only a tool to understand the situation. However, we tend to fall into a

pitfall of the magic of data and tend to be carried away by data.

(2) We tend to confuse whether we need data or not.

(3) We tend to miss the point of reasons about where real results come from…

(4) We tend to be satisfied with only the report and tend to be proud of gathering data, without solving any problem.

Another engineer gave me a thick report, saying: "I surveyed the efficiency of our company for six months." I said to him; "You did the most inefficient work, don't you?"[4]

Now we can understand the reason why Honda Motor could bypass other automobile companies.

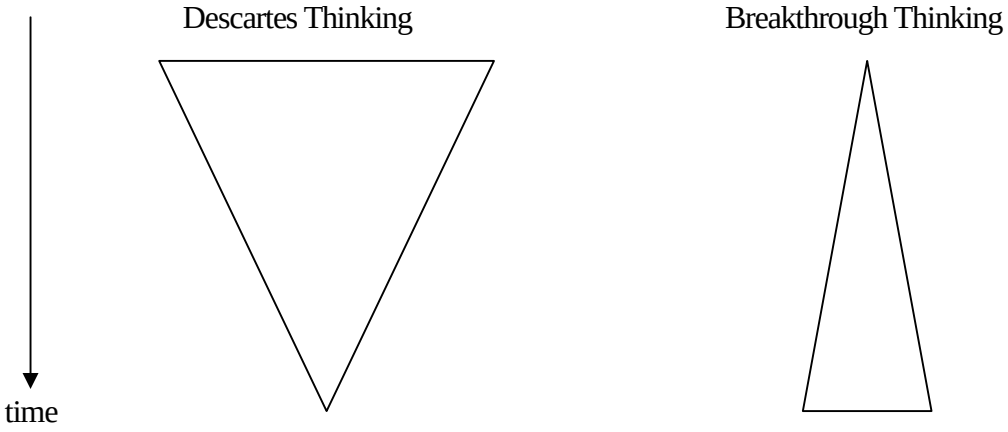
The pattern of conventional information gathering is shown as Descartes Thinking in Fig.6. In this case, we try to gather data/information for problem finding as much as possible, analyze them and find our problems. Then we try to think solutions for the problems. This is a world of "The larger data, the more accurate."

In Descartes Thinking, We tend to create "Problem expert", because we try to gather problem information/data and try to find problems. We know many problems. However, we don't know solutions and we don't have enough time and money to find solutions, because we spent time and money in finding problems.

The pattern of the information/data gathering for the bypass strategy is shown as Breakthrough Thinking in Fig.6. In this case, we try to think purposes, values, measures, objectives, concepts at the first stage. We don't need much information/data in this conceptual activity. Gradually we gather information/data for solution finding. We create "Solution expert", because we try to gather solution information/data in minimum and try to find solutions. The thinking productivity of Breakthrough Thinking is higher than the conventional Descartes Thinking, because the amount of information in Breakthrough Thinking tends to be less than one forth of that of Descartes Thinking. The thinking productivity is keen in bypassing, because time is money.

One of key factors for bypassing is to gather information for finding solutions in minimum.

Fig.6 Data/Information Collection



Involving People or People Design

Give everyone involved in the decision and affected by the eventual implementation of change the opportunity to contribute to developing and selecting the solution.

*** Conventional assumption:** The experts know everything and handle all solutions.

*** Case:** Toyota-ism is called as Genba-ism (On-site-ism). The people on site have ideas and solutions for actual problems. Toyota has utilized the people on site for solution finding.

There are two reasons why we need involve people.

1) Implementation is not to buy a computer and build a building, but to change peoples mind and behavior over time. A project will succeed if people understand them, even if they are small ideas. The project will fail if people can not understand them, even if they are super ideas. If you precede the project, without involving people on site, people resist the change and fall into a NIH (Not Invented Here) syndrome. Usually people love to participate idea generation and change if you make them involve.
2) People on site have ideas or solutions. Even if they do not have enough formal education, they have hot information and ideas/solutions (wisdoms). This hot information means the information in human brain. On the contrary, documented information is called "cool information". The future solution should be based on hot information, because cool information becomes out of date quickly due to the drastic change age.

Author received a telephone call from the president of one of the biggest American Insurance Company, saying "Please help us. We have a big problem, because we would like to enter into Japanese insurance market next spring. We asked consulting to a Japanese consultant. He said we need six months market survey, six months for analysis and six months for solution finding. The thinking productivity is very bad. This proposal is too late for our strategy. I ask you a solution finding in minimum time."

Author started this project by using new assumptions. I tried to involve people on site in company wide. Thirteen people including market professionals, lawyers, insurance salesman and so on, gathered at the Narita Hotel. We tried to think locus, purposes, values, measures, concepts and systems for four days. Then we dashed to implement these new systems, such as insurance contract, sales representatives, sales talk books, etc. in Japan for six months, and started new insurance from April next year. The result was great. This US Company has bypassed Japanese insurance company and will be a top runner in Japan in near future.

One of key factors for bypassing is to involve people on site.

Betterment Timeline

Implement continuous Kaizen and Breakthrough.

*** Conventional assumption:** If it isn't broken, don't fix it.

*** Case:** Toyota is famous in Kaizen (Continuous Improvement) and Breakthrough.

Fig.7 Kaizen and Breakthrough

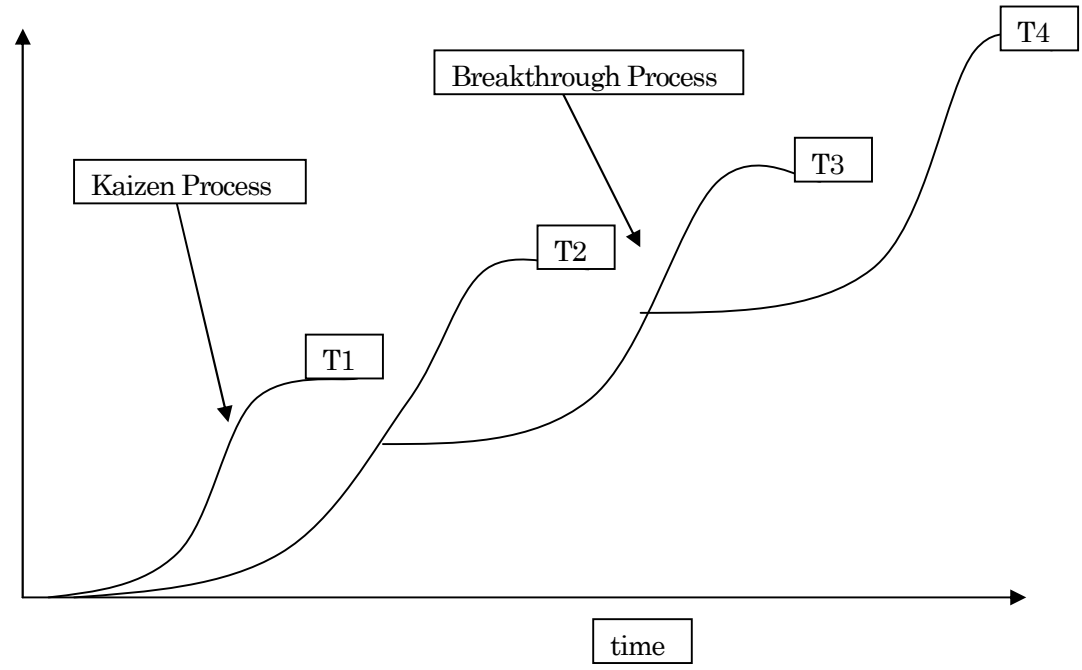


Fig.7 shows a concept of Kaizen and Breakthrough. We have to improve or kaizen step by step towards a target solution T1. However, this target will be out of date soon, due to the drastic change age. So we have to prepare the next target solution T2 at the stage of starting T1. When T1 is out of date, T2 will quickly enter market and so on.

Toyota has been promoting two managements. One is Improvement Management. Another is Breakthrough Management. Improvement Management is famous Toyota Kaizen Activity. Breakthrough Management is called "Breakthrough Toyota."[5] The Kaizen Management is a on-site base, small incremental change and people involvement. The Breakthrough Toyota is based on Breakthrough, absolute benchmark and drastic change.

Many ventures will bankrupt soon, although they are successful in first wonderful target. However, they have no Breakthrough Strategy and can not enter the next stage. Bypassing companies such as Toyota, COMPANY S, Honda, etc take actions for improvement and breakthrough.

One of key factors for bypassing is to take two managements, which are Kaizen and Breakthrough.

From these comparisons, the conventional thinking assumptions are out of date in such a drastic change age. In order to bypass the advanced countries and companies, we have to change our thinking assumptions and paradigm.

Another case study[6]

COMPANY S is one of super-top runners in the field of toilet, bath and kitchen makers in not only Japan, but also in overseas countries. She introduced these seven assumptions, which is Breakthrough Thinking, 1995 to the Ceramic Tile Division. The president M. Shigebuchi noticed that this Breakthrough Thinking is a key to success in next year and decided to introduce it as company wide activities in 1997. The author was a chief consultant of this project.

First of all, COMPANY S utilized this Breakthrough Thinking as a thinking paradigm of pro-patent strategy. The Figure 8 shows the result of introduction of Breakthrough Thinking. Note that the number of patents doubled in 1998, comparing with one in 1997. Figure 9 shows the number of Business Model Patent. Surprisingly the patent number in 2000 increased 4.3 times than one in 1999. This shows this Breakthrough Thinking is powerful, creative and theory of bypass.

After this, COMPANY S introduced this Breakthrough Thinking to The Customer Delighted Movements and bypassed many advanced companies in Japan, China and USA.

Fig. 8 Number of Patent

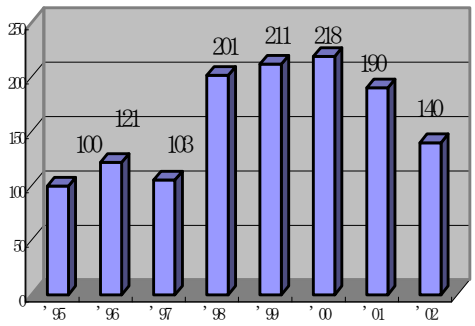
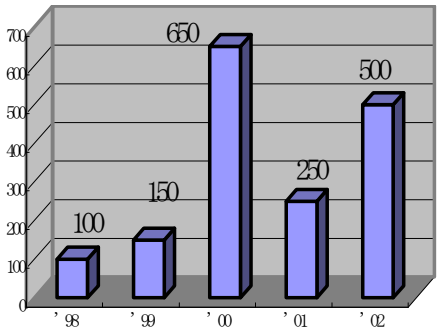


Fig. 9 Number of Business Model Patent



Conclusions

The "Catch-up" approach is not enough in such a drastic changing age. We need the theory of bypass in 21st century. This paper proposes a theory of bypass based on the new thinking approach and paradigm, which is Breakthrough Thinking. Breakthrough Thinking is the best thinking paradigm for the Theory of Bypass. We can develop new concepts, new products, new systems, new solutions, new software, new production systems, etc. without referring or introducing existing successful cases by using Breakthrough Thinking paradigm.

As I pointed out in cases, Toyota is a typical example of using these new assumptions. Toyota focuses on the uniqueness of her customers. She never copies the existing solutions. Mr. Kiichiro Toyoda could find out the substance of Ford's belt conveyor. Toyota is using the absolute benchmark such as just-in-time, no inventory. Toyota involves the people at the workshop for Kaizen activities. She collects the information for the solutions from the workshop.

Toyota is now promoting not only the continuous Kaizen activities, but also Breakthrough Toyota project for change. H.Thomas Johnson and Anders Broms, authors of "Profit beyond Measure" also points out in their book[7] that Toyota focuses complete different assumptions from other automobile companies for her management.

As our conclusion of this research, not only we should have an innovative mind[8], but also we need to change our thinking assumptions or thinking paradigm from Descartes Thinking to Breakthrough Thinking in order to bypass advanced companies and countries.

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