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# Method to Prepare the Environments To Encourage and Cultivate the Original Scientific and Technical ideas

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## ABSTRACT

When technician or researchers get an idea, the work is quite personal and it seems not to require any other help. However, in the process to cultivate the idea, researchers look for some hints widely in the whole scientific and technical fields, because almost all subjects in research belong to phenomena in complex system and the problems are usually cannot solve analytically. Thus, if researchers have big reference system from high-level encyclopedia to scientific abstracts with the powerful searching engine, they have big power to get the solution. Such a system, which is called here as “Knowledge Bank system”, is also quite helpful to look for the subject to research. Moreover, the discussions with persons in various research fields are also quite helpful to get some information to the problems. Before the discussion, the system also conveniently utilized to make quick understand and contribute to obtain fruitful results from the discussions. The hardest work to prepare the Knowledge Bank system is review techniques of the data and appropriate searching engine to refer from the key concepts.

If the enterprise wants to make maximum profit from the activities in Research and Development division, the facility should have multi-functions to make full use of the high ability persons or researchers. If such functions are ignored, the important results flue out to the competitive enterprises and big profit also go out. For such management, suitable and exact evaluations are required. A part of the members of R&D division have the excellent ability of such work. Thus, collaboration of R&D members and these in other divisions is one of the solutions to the problems. Such a business environments is considered to be just along the philosophy of capitalism.

## 1. INTRODUCTION

Every enterprise continuously required to make new business and the role of institute in the enterprise of Research and Development (R&D) system is getting important more and more. The role of research and development system is the central facility to answer the

scientific and technical requirements in usual case. For other problems in business, persons in respective division respond the various requirements based on their own talents, respectively.

Because the term of “original ideas” usually means that the new concept is out of logically closed system of deduced from the some basic key concepts, common sense or theories for the relevant concepts are not useful or not powerful to make original work in usual case. Thus, if leaders in enterprise require only originality to the members in facility of Research and Development (R&D) division or institute, the leaders cannot help but accept some thing which looks like contradictive or non-understandable work. Off course, such a thing is quite inefficient business and gamblesome dangerous as a system in enterprise. Thus, to avoid such dangerous inefficiency for R&D system in enterprise, original and related ideas should be mainly produced in national institutes and universities. The national facilities also accumulate in whole knowledge in the nation. Such accumulated knowledge should be charged in order to return the profit to researchers and whole people in nation who support by payment of tax. The specialists and researchers in the enterprise eventually obtain the quite original result on the way to the final purpose. Such a case is just the chance to get the large profit of the enterprise. Taking account of these things, the leaders should consider how to establish the institute in the enterprise.

Here, we discuss a method to encourage the original ideas and cultivate the power of evaluation in the enterprise.

## 2. IMAGINATION OF ORIGINAL IDEA AND THE SUPPOT SYSTEM

### 2. 1. The Background to the Original Idea

The most important procedure to form an excellent research system is how to assemble various research members who have flexible thinking and unique philosophy. Such members can produce unique ideas and unique abilities of discovering and evaluation to realize the purpose. The coordination of the obtained original work or seed to requirement from the market is also important procedures. The research institute in the

enterprise is always required to perform these duties at least. The possibilities of successful procedure to realize the system in order to respond to such problems mainly depends on the philosophy of the top leaders in the enterprise.

Birth of original ideas or new revolutionary key techniques or scientific knowledge produced in the R & D system are completely depend on the ability of imagination in the brain of each constituent member in the institute and such work is completely personal and depends his talents. Therefore, any other help and support system seems not to be required. However, some support systems have been quite helpful to these specialists and researchers. As is mentioned in previous section, it is noticed that the original ideas are usually out of logically derived results. Therefore, to obtain the hints to the solution, communication and exchanging of opinions with the people in wide research fields are quite useful, because some quite different and exotic features to the same subject may be quite suggestive and inspire the imagination to the own subject. Moreover, some suitable and sophisticated referring system is also quite useful to look for the various features used in various application fields.

Besides the direct support to make imagination to original ideas, the environments of daily life now and the future perspective after their abilities diminished are also quite important, because the provability of success is not high generally to the revolutionary original work. If any support systems are not prepared for these problems, the challenging spirit will do not come into the fields of R&D system and such a system will lost the basic ability. Moreover, when an enterprise decides to dismiss some researchers, the top leaders should make up their mind to outflow of the basic concepts of ideas and they should estimate the large loss, as exact as possible. In usual case, the appropriate evaluation has not been performed, so far and it can be seen that large profits are usually lost form the relevant enterprise.

On that point of view, we presented in the previous section as the hopeful system of institute not only for members in R&D system, but also persons in other divisions in the enterprise. The hopeful knowledge systems to inspire the birth of the originality are also should provide in the institute. The methods are discussed following sections.

## 2. 2. System of Institute with Multi-Functions

The experts or specialists are inevitably required to have abilities of discovery of the original problem and the evaluation to degree of value in the whole scientific and technical fields. Moreover, they are requested to estimate approximate timing to get the answer to the problems. These abilities are also required to the

business leaders in the enterprise, because the abilities are quite effective to make the strategy to get the maximum profit from the business action.. The members in R&D system generally have big abilities in comparing to the other members because their works are always requited and trained to explain the value of their own research in their daily activities.. If the leaders in enterprise can establish such organic system in the institute on the wide and flexible view, the system of institute is established as a highly efficient system that can powerfully contribute to whole business actions in the enterprise. Such a system may be called as “multi-functional Institute”.

Generally, the division of labor is one of the basic and important principles in the capitalism. It is believed that the cooperative work by respective specialists to the divided work can produce high quality products with the highest efficiency. To make the people concentrate to the own work enough, the minimum stability of the daily life in now and future even after retirement should be also ensured. If such care is ignored, specialists also consider the future life and they force to get some money by use of their special ability. As the results, the almost all important key technology and know-how easily flow out from the enterprise. Sometimes the enterprise has much more loss than their adoption. For these highly technical and political works, some senior members in R&D system have quite appropriate power and discretion. On these backgrounds, the establishment of multi- functional institute is hoped.

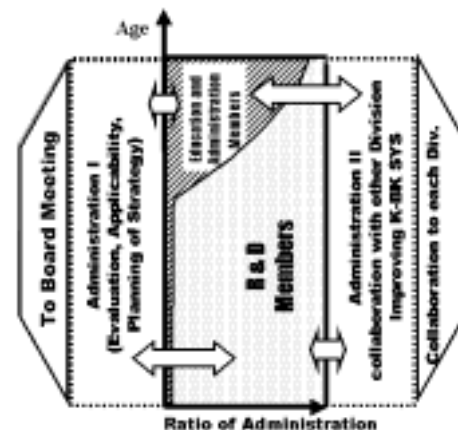


Fig.1 Structure of “Multi-functional Institute” in the enterprise. Senior researchers are turn around to administrative work, after they lost the ability of R & D work. White arrows mean exchange prams by R&D to other divisions. .

R&D system enterprise usually accumulates rich knowledge in long period after establishment of the

enterprise and is able to have strong ability of the evaluation and wide viewpoints to the whole research fields. Such a suggestion system is quite useful and required to respond to the collaborative works with some different divisions in the enterprise. Especially, some senior members in R&D system have also such abilities and if the enterprise can cleverly organize, such a suggestion division with suitable administration system as a multi-function institute. Such a research system can make totally contribution to make big profit to the enterprise. The multi-functional institute is considered to be as a control system to whole enterprise. Excellent system such as human body has such control system to the main functions of the enterprise.

The abilities of evaluations are also quite useful to the business action in various divisions. Even in the collaboration between marketing division and R&D division, the results of the work is quite useful, because persons in institute recognize the degree of acceptance in the present people in the market to the newly developed project and persons in marketing division also recognize their real values and future possibility for the potential of the results to the market. As the results of such collaborations, effective discussions can be performed to make suitable business strategies to obtain the maximum profit and the methods of appropriate advertisement and suitable evaluation to the contributors to make sustainable developing managements. Though these discussions look like opposite direction in recent economics [1], on the long term point of view, sustainable developing of the enterprise is consistent with the happiness of majority of the people, because only a few winners have much profit in the strict competition among the enterprises [2]. Heavily competitive environment do not produce any big originality based on the deep and wide thinking process by researchers. Such a severe competitive environments should be within the marketing actions and the fields of superficial applications [2].

Especially, the creation of job and making a suitable position to the senior persons in R&D system various activities are quite important to keep the key technical knowledge and know-how in the enterprise. If such system is not installed, the unique and important wealth in the techniques is go out with the retirement of these senior specialists from the enterprise. Moreover such important technical information may be easily goes to the competitive enterprise. Moreover, if the enterprise do not support the pension system, the researchers do not open to the relevant enterprise to confirm their future life. Because the activities in R & D are quite complicated, the causal relation cannot prove well for the motion for judgment pleadings. Thus, the installation of these basic systems is key point to establish the system of institute in enterprise. Thus, in

order to realize the big original work, researchers or technicians should be secured stable but minimum amount of financial backup for many years. This way is completely along to the concept of "division of labor", which is basic and key philosophy of capitalism.

### **2. 3. System to Encourage Original Idea**

When a researcher or technician obtains an inspiration of the original idea, he will, at first, search and check some related references and examples. Their main attention is focused to the resembled idea in different fields and he will try to find the real problem to be solved. By utilizing of the efficient searching procedures, researcher or technician can cultivate and develop their imagination and finally find the way to realize the idea. However, such a searching and checking procedures are quite annoying one or rather, such procedures frequently disturb the continuous thinking and sometimes abort the cultivation or progressing to the original idea. Thus the installation of wide and deep knowledge system with convenient and quick response searching engine is the one of the most required environment to the R&D. division.

The most difficult point of the referring system is in the fact that fairly large number of people do not always input the exact word (or mistype). The searching engine should be clever enough to accept such a incorrect words, and moreover it suggests the corrected expressions and show us correct ways. Such a system can largely contribute to look for the hopeful expressions and can present the appropriate information. Recent development of data mining methods can enough respond to such a requirement [3,4].

Review of knowledge to answer the suitable response is also important but difficult procedures, because big ability to make overview of all scientific and technical fields are requires to realize it. The most realistic method is to utilize following points: every paper always include abstract and title. The digest information is included in these terms and reference system may connects these terms and keywords to the essential concepts in science and technical fields. Some computer reference systems have quite convenient searching engine to look for such subject, title and the abstract.

Because a quite number of papers are produced in the world now, each person even the member in R&D system can read only a part of them. Therefore, in order to invite to read the content to many people, the reporter of such work should recognize the important role of the title, keywords and abstract of the paper.

The collection of the papers and referring system of the papers are usually prepared in the library. The role of library is also quite important to assist the cultivation of imagination in R&D system. To respond to the

requirement for these roles, possible facilities should be built in the library.

As mentioned before section, in order to make the really original work, the researchers are required to realize the break through work. The break through work is usually out of a flam work of the logically derived closed network. The persons of administration in R&D system can effectively contribute to such work, if they understand the suitable balance between concentration and relaxation. In fact, fairly many original works have been born in the relaxation times. Considering the balance of time, the effective duties of seminar and meeting should be arranged to the R&D members. Invitation of lecturer in seminar is also effective method to inspire the original work. Feeling of experience of original work is really exciting to the outsiders and such a seminar should be planned by the administration division. Other seminars to the specialists are usually planned by themselves and the seminar usually exchange their information each other.

In these rich environments some of them make some originally big results to the enterprise.

### 3. DISCUSSION AND CONCLUSION

Every enterprise continuously required to make new business and the role of institute in the enterprise of Research and Development (R&D) system is getting important more and more. Though original ideas or key techniques in the new revolutionary techniques produced in the R & D system are completely depend on the power of imagination in the brain of the constituent members in the institute and such work is completely personal and depends his talents, some support system based on the knowledge system still quite useful to encourage their imagination and finding the original solution. The administration system should be prepared by considering that really original work is out of framework of logically derived solutions from the basic known results.

Recent development of computer technology makes us prepare the high efficient knowledge bank system. Especially the development of searching engines is quite remarkable [3,4]. Moreover; review of various works and their representation method is also available on the development of the high efficient computer system. Especially, animation representation of the high level concepts is also possible to use under the large memory system and its reviewing techniques. Such animated review is also quite useful to easy education to the non-specialists. Such environment makes us possible to have common view among the various divisions and leaders even to the board meeting members. Thus, various collaborations are possible to realize on the wide and deep knowledge system

installed in the “multi-functional institute. Especially, powerful strategy can be planned by the members between board meeting and R&D division to obtain the maximum profit under the long-term foresight.

Such knowledge system is not required in relatively small enterprise, because all members have enough power and have direct communications and the consensus among the members is easily made. However, in the big business system, such mutual communication can not expect. Thus to make carious business action on the common knowledge and mutual understanding the knowledge system and the multi-function institute are necessary to make.

Finally, it is again emphasize that the capitalism is based on the division of the labor and the market is the only facility of controlling system to the amount of products. People join and contribute with the most appropriate field. The severe competition is happened in the popular works. Though the markets strictly restrict and heavy competition looks like scathing. The treatment to the rejected persons is the most difficult problem to solve in the society. Any way, leaders always recognize that business exists on the employees and in the society of human and if the enterprise is lost such a sense, the enterprise is not loved and disappeared in near future. The most appropriate strategy on the wide business view and power of long term foresight. produce maximum profit and support sustainable developments of the enterprise. The multi-functional institute gives powerful help such activities.

**Keywords-** encourage system: original work: knowledge science: searching engine: wide and deep knowledge: review technique: computer science: animation representation: multi-function institute: business environment: flow out of idea: R&D system: collaboration with R&D: business strategy: research environment:

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