# **Creativity Mining for Creating a Creative Society**

Kazushi Nishimoto Japan Advanced Institute of Science and technology knishi@jaist.ac.jp

Abstract : To survive in the creative society, it is strongly required to increase creative human resource as soon as possible. Therefore, making not-yet-creative people creative is an urgent issue. However, traditional creative education and ordinary creativity support tools are not enough to efficiently achieve it. This talk introduces "creativity mining technology" that can contribute to this requirement.

Keywords : Creativity mining, not-yet-creative people, creative society

## 1. Introduction

It had been pointed out that the 21<sup>st</sup> century would become the "knowledge society" from the "age of capitalism" [1]. Actually, the knowledge society had been established at the end of the 20<sup>th</sup> century. However, it was not so long for a lot of newly created knowledge immediately became commoditized because of the rapid and wide spread of Internet. This means that only having knowledge is already not enough for being highly competitive. It became important to have high ability to keep on creating new knowledge for being highly competitive. Namely, the knowledge society has already been shifted to the creative society [2].

To survive in the creative society, it is strongly required to increase creative human resource as soon as possible. This talk discusses some ways to satisfy this requirement and proposes our new concept "creativity mining."

# 2. The Ordinary Ways for Increasing Creative Human Resource

#### **2.1 Creative Education**

At present, it has been probably suggested that the only usual and practical way for increasing creative human resource is creative education. Creative education is necessary and effective for fostering children's creativity in particular.

However, several serious problems have already existed. First of all, the procedure takes a very long time and imposes very high load to learners. For example, a lesson of musical instruments such as a piano is a kind of creative education. As you know, it usually takes several decades for pupils to become able to perform the musical instruments as they imagine. Second, it is not necessarily guaranteed whether the learners will successfully obtain creativity in the domain after receiving the creative education for a long period. Actually, there are only few people who can manifest their musical creativity and earn their living although a lot of people study music and dream to become professional musicians. Most of them have to give up their dream after prolonged and hard efforts. Third, a relatively large part of the creative education is actually teaching uncreative skills. For example, in the piano lesson, a Chopin's piano piece is assigned to the student and he/she makes effort to be able to accurately and completely perform the given score using the piano. However, even if he/she finally achieves it, where his/her creativity is manifested? He/she may become only able to "replay" the Chopin's work; then he/she creates nothing at this moment. After completion of such uncreative tasks, genuine creative task eventually starts where his/her original musical expression is created. However, it consumes too much time and efforts to reach this stage. Furthermore, the students often misunderstand that this uncreative task is the objective.

As a result, the conventional creative education is actually not so efficient although it is basically effective. However, there are no other practical selections at present. Hence, some revised methods for fostering creativity are crucially required.

#### 2.2 Creativity Support Tools

Since 1980s, various creativity support tools have been studied and developed. They can be classified into following three categories.

The first category is a tool that simply imports some idea creation methodologies such as KJ-method and Brainstorming into a personal computer [3][4]. The second category is a tool that allows creators to externalize their inner thought for obtaining *reflections* and for amplifying *representational talkback* from the externalized thought [5]. The third category is a tool that facilitates professional creators' creative activities based on analytical studies on them [6].

Such creativity support tools can enhance users' creative activities. However, it is a big problem that most of the ordinary creativity support tools are not available

for everybody; only already creative people such as professional creators can use them. The following reasons might be able to explain the issue. It is usually quite difficult for people to use the ordinary idea creation methodologies. То effectively use KJ-method, Brainstorming and so on, the users of the methods should be well trained about their usage. It is also not so easy for people to externalize their inner thought. For example, you can easily imagine how it is difficult to draw your friend's face in your memory. The tools tuned for professional use is not always useful for novices. We usual people cannot drive a F1 machine. Thus, in spite of the fact that the creativity support tools can increase creative productivity of the already creative people, they cannot contribute to increase creative human resource.

# 3. Creativity Mining

In order to increase creative human resource, the most important thing is to make so-called "uncreative" people become creative. Here, I should put stress on that there is nobody who is really uncreative. I believe that everybody has some creative ability. However, there are many people who cannot manifest their potential creativity, and, furthermore, there are even many people who are not aware of their having creativity. In my opinion, such people should be called "not-yet-creative" people, rather than "uncreative" people. If we can efficiently metamorphose a lot of such not-yet-creative people into the creative, creative human resource can be drastically increased, and the real creative society will arrive.

Creativity mining is a technology to achieve it. There are three types of not-yet-creative people. The first type is people who know they have some creativity but they do not have or lost ways for manifesting it. The second type is people who are not confident of having some creativity. As a result, they also do not know how to manifest it. The third type is people who are not aware that they have some creativity and think that they are not creative.

To support the first type, it is effective to eliminate or alleviate barriers that prevent them from manifesting the creativity. High-tech prosthesis, brain machine interface, and powered exoskeleton are the promising technologies for supporting this group. Redesigning tools for creative activities (e.g., musical instruments) that allows users to skip uncreative stages in a creative activity is also important approach for supporting this first type.

Creative education is the most common way for supporting people in the second type at present. However,

as mentioned above, it includes various severe problems. Therefore, some new methods for supporting them are highly expected. A technology that allows them to "try" a situation where they obtain the necessary creative abilities can be a candidate of this method. In other words, this technology substitutes for them to execute necessary but uncreative tasks in the creative activities and allows them to purely concentrate on the indeed creative tasks. Through this trial, if they can believe that they have necessary creativity, then they should start creative education. Thus, risks of wasting long time are drastically alleviated by this technology.

Supporting the third type is the most difficult. It is not easy to find latent creativity that is buried within a person and that he/she him/herself is not aware of its existence. The only method to support this type is to provide various occasions for making him/her aware of his/her potential creativity. In other words, this would be a kind of "serendipity" support technology.

## 4. Conclusion

In order to survive in the creative society, we should create some methods for increasing creative human resource. To achieve that, making not-yet-creative people creative is an urgent issue. I strongly believe Creativity mining technology can contribute to this requirements.

#### References

- [1] P. F. Drucker, "Post-Capitalist Society," HarperBusiness, 1994.
- [2] M. Resnick, "Sowing the Seeds for a More Creative Society," Learning & Leading with Technology, International Society for Technology in Education, pp. 18-22, December/January, 2007-2008.
- [3] K. Sugiyama and K. Misue: A Generic Compound Graph Visualizer/Manipulator: D-ABDUCTOR, Proc. Symp. On Graph Drawing (GD `95), Springer-Verlag, pp.500-503, 1995.
- [4] M. Stefik, G. Foster, D. G. Bobrow, K. Kahn, S. Lanning, and L. Suchman, "Beyond the chalkboard: computer support for collaboration and problem solving in Meetings", Communications of the ACM, Vol. 30, Issue 1, pp 32-47, 1987.
- [5] K. Hori, "A system for aiding creative concept formation", IEEE Trans. on Systems, Man and Cybernetics, Vol.24, Issue 6, pp. 882-894, 1994.
- [6] K. Nakakoji, Y. Yamamoto, S. Takada and B. N. Reeves, "Two-dimensional spatial positioning as a means for reflection in design", Proc. The 3rd Conf. on Designing interactive systems: processes, practices, methods, and techniques, pp. 145-154, 2000.