A Rational Judge for Disruptive Technology

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Abstract: The concept of disruptive technology can be analyzed from three perspectives: ontology, epistemology, methodology. In terms of ontology, this concept is composed of three parts, 'technology A', the subject, 'technology B', the object, and the comparative conclusion 'disruptive'. In the same subjective and objective context, when technology A is compared to technology B, its function reaches a maximum value, so that the function of technology B is equivalent to 0, it can be determined that technology A is disruptive. The dimensions of this comparison can be time or space. In terms of epistemology, judging whether a technique is disruptive can follow the principles below: maxima and minima of time, maxima and minima of space, and maxima and minima of material properties. In terms of methodology, it is necessary to correctly identify disruptive technology and support it, correctly handle the relationship between sustaining technology and disruptive technology, as well as incremental innovation and disruptive innovation, to prevent technical disparity and technical dead ends.

1. Introduction

Disruptive technology, as a hot topic nowadays, has been widely disseminated by the newspaper media, as if all the technologies linked to disruptiveness represent advancement and civilization. However, "What is disruptive technology and what is disruptive technology to subvert?"[1] It can be understood that, first, disruptive technology is a hot topic nowadays, which is commonly used by academics and the media; second, the concept of technology is still not clearly defined. This paper sorts out the concepts related to disruptive technology in order to obtain a clearer understanding of this phrase.

2. Research Review on Disruptive Technology

The concept of disruptive technology originated from the "wave of opportunity for disruptive technology" published by Professor Clayton Christensen of the Harvard Business School in 1995. In 1997, he made a more systematic exposition of this concept in the "Innovator's Dilemma: When New Technologies Bring Bankruptcy to Big Companies." In 2003, in the sequel, "Innovator Positive Solutions," he replaced "disruptive technology" with the concept of "disruptive innovation."[2]

"Clayton Christensen puts forward in the background of business innovation. He believes that disruptive technologies are often begins from low-end or marginal markets, replacing existing technologies with improved performance."[3] Science and Technology Daily reports that disruptive technology will have disruptive effects on existing technology, may be completely innovative or innovative based on existing technology."[4] People's Liberation Army believes that "disruptive technology can be used in the defense and military fields to create disruptive innovations. The technology of effects radically changes the military power."[5]

However, there are certain problems with the disruptive technology concept. First, the concept is confusing. Second, the definition of related concepts is built on a certain description of sensibility. It does not do abstract concepts of metaphysics. Third, the composition of the concept has not been effectively analyzed. Fourth, although most scholars give their own understanding of concepts, however, it is also necessary to work out how to judge whether a technology is disruptive. Fifth, the methodology on the concept is too complex and there is no principle guiding the methodology.

3. The Ontological Definition of Disruptive Technology

From the perspective of word formation, the concept of disruptive technology consists of three parts: the technology as the subject (technical A) and the technology as the subject of the comparison (technique B), the adjective attribute revealing the comparison result as “disruptiveness”. It is worth noting that the disruptive technology should obtain a meaning of comparison, otherwise there will be no object to subvert this action, and its conclusion will become an empty set. Then how to make a comparison between the two?

Technology exists as an objective, and its existence includes three dimensions as time, space, and material existence. Technology A and Technology B are existing things while disruptiveness shows the result of the comparison between the two. Both are the existing things and they can only be compared with the perspective of time and space and the existence is regarded as a comparative result. From the time point of view, Technology A represents innovative technologies at the moment or in the future while Technology B represents old technologies in past or at the moment. Comparing each other, if the conclusion is disruptive, it means that Technology A can completely replace and overturn Technology B and the existence of Technology B is equivalent to nothing as Technology A. From the spatial point of view, Technology A represents technology of Party A Technology B represents technology of Party B. Comparing the two parties, if technology of Party A subverts Party B, it means that Technology B has no recourse against Technology A and the existence of Technology B is equivalent to nothing as Technology A.

In summary, disruptive technology is the comparison of Technology A and Technology B from the time point of view. When the consequence makes technology B present a minimum value approaching 0 in front of technology A, then technology A is a disruptive technology. It is worth noting that the concept of disruptive technology must be limited by empirical conditions and can only be utilized within the same category. The first is the subjective category. All disruptive technologies can be used in the same idiosyncratic context. The second is the goal category. Technology cannot do without nature.

4. Judging Techniques Possess Disruptive Standards

Only the criteria for judging the concept can be clearly listed which means finding technical indicators that judge a technical or technological idea possessing disruptive technology can bridge the convergence of ideas and the application of methods. First of all, it must be certain: Firstly, disruptive technology is an empirical concept and it is impossible to provide a specific standard for it. Secondly, disruptiveness is a subjective metaphor which can only provide general principles. Thirdly, the following criteria are built on the same category.

Under the above premise, the concept can be analyzed to obtain some judgment principles. A technology as an empirical existence is nothing less than three dimensions: time, space, and its own attributes. The foregoing is a comparative dimension of the existence of the two technologies. Here refers to the specific technical indicators for comparing the two technologies. Therefore, comparing two technologies can determine whether a technology is disruptive. Compared with technology B, Technology A achieves a maximum in time, space, and property. This maximum value means that the utility of technology B is almost zero for technology A, and it can be determined that technology A reaches a maximum value and can be considered as disruptive. In addition, for Technology B, the reference system of Technology A that we are involved in can have two options. One is the general dimension, that is, whether Technology A is disruptive to the experience standard of universal technology; the second is a special dimension, that is, whether Technology A is disruptive to a certain technology.

5. Methodology for Developing Disruptive Technologies

The ontology and epistemology of this concept laid a solid foundation for the development of methodology for disruptive technologies, founded on the above-mentioned viewpoints and social

reality. Methodological principles can be given from several dimensions.

If efforts are made to develop Technology A and identify it as subversive technology for practical and financial support:

First, technology A must firstly conform to the laws of science and be feasible.

Second, technology A must be consistent with the category. It must satisfy people's subjective needs as well as the objective conditions, otherwise it loses the prerequisite for comparison.

Third, technology A must be subversive. That is, whether the two technologies constitute a comparison and whether Technology A can reach a maximum value for Technology B.

If you neglect development technology A and stay at the level of technology B, you will have two consequences:

First, the technical dead at end. Some promising technologies have not meant developed. When others show these technological achievements to our eyes, they are right on a loss.

Second, technology generation. The existing technology is developing at a relatively slow pace, lagging behind advanced technology, and passively becoming a technology B in front of technology A, resulting in a minimum value of technology and forming a favorable situation for the opponent.

In order to avoid such a result, two relationships must be handled:

First, the relationship between maintenance technology and disruptive technology. On the one hand, we must keep pace with the forefront of the times, strive to develop sustaining technologies and prevent technological gaps. On the other hand, we must pay heed to and examine emerging technologies, encourage and support development, and prevent technological dead ends.

Second, the relationship between incremental innovation and disruptive innovation. Progressive innovation is closely linked with practicality, and its results are more easily presented. The R&D rate is higher, and it is often paid great attention to. Disruptive innovation originates from the field of thought and basic science. The correlation between scientific research and reality is relatively loose. The consequences are not easy to visualize and are easily overlooked. However, once a breakthrough occurs in the basic science field, the technological innovation it brings is often destabilizing.

Therefore, we must give attention to innovation in the basic science field. Progressive innovation and disruptive innovation are just as important.

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