An Analysis of the Influence of Technological Innovation on Social Culture In the Process of Technological Evolution

Author's Details: LI Peng [1], WANG Rui [2]

1 school of Marxism, Northeastern university,P.R.China,110006

2 school of law & art, Shenyang University of Technology, P.R.China, 110870

Abstract: *Technological innovation has entered into our social life through medical technologies, informative technologies, industrial technologies, experimental technologies and other approaches, and has deeply influenced the way people live, behave and think. The cultural innovation brought by the demonstration effect of technology. Enrich ideational culture to achieve a fundamental change of lifestyle. Build new system cultural pattern through innovation incentives. Create an affluent and critical material and cultural environment. Meanwhile, Technological innovation is both concrete and historical, and abstract and evolutionary.*

Key Words: *Technological innovation, social culture, influence, technological process*

1 Introduction

Technological innovation has entered into our social life through medical technologies, informative technologies, industrial technologies, experimental technologies and other approaches, and has deeply influenced the way people live, behave and think, when the first CT machine replaced a batch of traditional medical methods to diagnose diseases as well as when mobile internet, big data and E-business locked people's life to screens. It is a time when technological innovation has gone beyond the technology itself and has become a general human practice that can be spread and a way of behavior that is commonly recognized and utilized.

2 Results

2.1The cultural innovation brought by the demonstration effect of technology

Since the industrial revolution, the huge value of technological innovation has benefited all areas of social life along with the popularization of technological innovation produces. Meanwhile, the profit-driven mechanism is also adopted in the utilization of science and technology, which promote a more effective transfer of science and technology to real productive power and created more social values than the total of all past eras. By utilization and introducing its own or other scientific and technological results, technological innovation not only recombined the existing productive technological elements which produced further economic benefits, but also allowed people to be active, initiative and creative, which formed or created a new value concept, code of conduct, and even the managing system or institution. Hence, if an enterprise or a country successfully realized technological innovation, it can promote its cultural innovation guided by innovative products and economic benefit through the "culture demonstration effect." And the process of the promotion can also be called as the culture diffusion or transferring process of technological innovation [1]. A social, cultural innovation is realized through spirit culture, system culture, and material culture.

2.2 Enrich ideational culture to achieve fundamental change of lifestyle

In a certain sense, "ideational culture" can be seen as an externalization of people's spirit. While undergoing innovative practice constantly, the subject of technological innovation makes a choice of value at first, and what after the choice is an affirmation towards the practice, and finally comes to a result applying this value whereas denying another, thus generates constellation effect of technological innovation in the affirmation process of innovative behavior, which laid a psychological foundation for value orientation and pursuit of technological innovation. Just as Qi-Man said that technology could not be separated from culture and that material artifact*s* encode, represent, express or propagate *non-material* concept and the whole system of behavior patterns [2]. In terms of technological innovation practice of booming development across the globe, technological innovation characterized people's behavior with "Technology—*Economy*," therefore, human beings are more concerned with efficiency, cost and opportunity than ever before, and unleash the economic value of technological innovation for their own purposes. This

shows that technological innovation is different from the technology featuring technological invention and technological creation. Meanwhile, this kind of life and production practice promotes changes in organizations, regulations, and rules in the whole society conversely, playing a huge role in remodeling human beings' belief, to make them conscientiously accept and form a belief taking pride in technological innovation.

On the other hand, when the innovative cultural spirit is existing in technological innovation which can unleash human being's potential, encourage adventure and allow failure, is spreading from an individual lifestyle to a common socio-cultural mode, the psychological feature would exert a potential impact on the implementation of future technological innovation. This impact is not only internal, informal and intangible, but profound and long-term thus brings fundamental change to people's lifestyle. Just as Marcuse said, technology advancement has become a generally accepted norm; technology advancement combined with the requirement of developing productive forces and enjoying sustained growth has made culture, politics, and economy in a ubiquitous control system [3]. A growing number of evidence shows that cultural support occurring in the development process of new products in high and new technology industry is able to encourage participants' spirit of the invention, innovation, and initiative—such as spirit beneficial to new product development [4]. For instance, 3M Corporation in the US encourages innovation with "Never kills any new idea," and "Only be tolerant to errors, can we be innovative" as its cultural concept. Thus it becomes a corporation with "the most pioneering spirit." Whereas Silicon Valley praises "Everyone is free to fail, but no one is allowed to be not innovative" and "One should award risk-takers instead of punishing those who fail because of taking risks," forming a dense entrepreneurship atmosphere. Therefore, even its successful startups after three years are less than 1%, Silicon Valley still embraces constantly new companies, becoming the most valuable city in the US.

2.3 Build new system cultural pattern through innovation incentives

"For any creation, only when implementing objective necessity, can it be in a lofty position, so Plato believes that creation submits to conception; Kant thinks that creation submits to common regulations." [5] When people indulge in technological innovation world, civilization began to seek authority and contentment, and build their own order in technology. Just like Big Data can increase information supply, it will inevitably lead to an increase of information control mechanism. And because the new control mechanism itself is technology, so it increases information supply in turn [6]. The enhancement of social technology dependency and technological dominance triggered by technological innovation will surely bring a renewal of social system and cultural layers and redefinition of function.

To begin with, from the perspective of six dimensions of cultural evolution constraints (TRIPPE), namely, change, acceptance, implementation, communication, production and assessment, innovation may be the first step towards structural change for culture. Individual innovative behavior must be distinguished from acceptance towards this innovation of those with similar or complementary responsibilities. Individual arbitrariness and different understanding of technological innovation claim new organizational model [7]. From Adam Smith's analysis of relationship between division of labor and its technology, Marx's analysis of the development of production machines, Babbage's analysis of division of mental labor, and Woodward's research on "strong relationship" between organizational structure and its workflow technology, we can see that modern organization forms evolved as modern technology developed, and human being's technological innovation practice eventually led to the emergence and development of corresponding organizational forms [8].

Next, as a creative intelligence resource, technological innovation needs fair and powerful legal means to secure its fruits of labor. Max Weber believes that "applicable" system not only enables people to handle an interpersonal relationship on a rational basis but also generates "reasonable economic behavior" and constitutes legal governance basis.

Patent system and intellectual property system developed on its basis center on the means to safeguard lawful rights and interests of knowledge owners and intellectual resources creators and motivate their enthusiasm, and promote technological innovation and eventually generate a new system featuring economic growth. The above-said systems emerged precisely because they adapted to the institutional legitimacy of technological innovation fruits. According to Acrich, technological products limit actors and their space to act, which exist in the mutually restricted process with human beings, constructing the history and presenting a framework to take some actions. Thus, new technology and its innovation generate new forms

or new rules regarding world causality, as well as new regulations regarding world knowledge [9]. At this point, new forms, new rules and new regulations are institutional innovations based on technological innovation requirements representing by technological products in order to guarantee that technological innovation carries out successfully.

Finally, technological innovation is a continued decision-making and learning process carried out by technological innovation subject. At the enterprise level, enterprise's institutional culture carried out on the basis of ideal and belief, value and code of conduct constraints and regulates employee's behavior, which directly reflects the level of technological innovation of enterprises, as well as people's acceptance and understanding level of technological innovation. To a large level, technological standards of international uniform and uniform of industries, establishment of industry standards; to a small level, technical manual within the enterprise, education training and the formation of rules and regulations, all the above is a positive institutional response done by technological innovation subject to adapt to technological innovation practice.

2.4 Create an affluent and critical material and cultural environment

Material culture represents all material goods human beings created in material production activities, and tools, processes and methods used in creating these goods. Located in the outermost layer of the cultural system, material culture is the direct object of human activities, which undergoes some more and more frequent changes, modifications and updates than spiritual culture and institutional culture. When it comes to technological innovation, the innovation for human beings' material cultural life is the most direct and intuitive compared with its lagging in the concept and system level.

Firstly, new technological innovation product itself is a new element of human beings' material cultural world, which brings new features for the entire material culture. Every successful technological innovation or fundamental innovation that brings new technological structure and principles or innovation based on original technological structure and principles add new qualities for the whole human beings' material and cultural world, thus becoming a part of the entire human beings' material culture. In general, new technological innovation product is a set contains a series of new material and cultural achievements, and besides non-assembled products and simply assembled products, there comes more and more system products [10].

Secondly, a new material product often triggers a series of updates products, thus led to chain reaction from material goods to information dissemination. In human history, the emergence of printing technology once led to a cultural revolution, which accelerated human civilization progress. Before printing technology appeared, social information is documenting depended almost entirely on manual transcription, but because manual transcription was not only cumbersome and slow, but also costly, resulting in only a very few people can have written information, and its circulation was limited and easily lost. After printing technology had emerged, especially after the emergence of printing machines driven by the steam engine, they promoted document production in a large scale in society. It enabled people to document and "reprint" a large number of written information at a relatively low cost, thus accelerating the spreading of written information.

Finally, frequently changed, modified and updated technological innovation products constitute a "material" world changed with each passing day as a whole. Every major breakthrough in technological innovation would bring human being's practice to a new scope and depth. For example, the use of radio telescope enabled people to observe the macro universe for more than 20 billion light-years. The successful application of manned space technology not only expanded human being's range of activity from land, ocean and atmosphere to space, but also allowed people to take advantage of the special environment of space and manned spacecraft to conduct various research and experiment activities so as to exploit abundant space resources, and etc. [11].

3 Conclusions

Technological innovation culture, defined as innovative products and institutional norm-forming and creating during the process of technological innovation practice, is a combination of various innovative cognitions and ideas in the technological innovation activities. In accordance with the classification of culture, technological innovation culture can be divided into three technological innovation cultural types: implement type, system type, and spirit type. Fundamentally speaking, what technological innovation culture wants to represent and solve is the track of technological innovation, that is, why technological

innovation is moved towards this direction instead of another. In this way, we can regard technological innovation as a special form of social behavior and structure. Technological innovation is rooted in a specific social environment, and its track and state are decided by interests of different social groups, cultural choices, value orientations and power structures. Technological innovation is both concrete and historical, and abstract and evolutionary.

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5 References

1. Zhang Mingguo.Technology Culturalism [M].Beijing:Tongxin Press,2004:154.
2. [UK]John·Ziman. Technological Innovation Evolution [M].Shanghai:Shanghai Scientific Education Press,2002:9.
3. [GER]F·Rapp.Philosophy of Technology Introductory Theory [M].Shenyang: Liaoning Science and Technology Publishing House,1986:13.
4. Zien, K. A., and S. A. Buckler. From experience. Dreams to market:Grafting a culture of innovation[J].Journal of Product Innovation Management,1997,14(4):274-287.
5. [GER]Landman, Yanjia.Philosophical Anthropology[M].Guiyang:Guizhou People's Press,2006:201.
6. [USA] Postman,N. Technopoly:the Surrender of Culture to Technology [M] Cai Jindong&Liangwei Trans.Beijing:ChinaMachine Press,2013.10:66-67.
7. Ramsey, Grant. The Fundamental Constraint on the evolution of culture [J]. Biology and Philosophy,2006:6.
8. [UK]John·Ziman. Technological Innovation Evolution [M]. Shanghai:Shanghai Scientific Education Press,2002:280.
9. Bijker, W. E., and J. Law, Shaping Technology/Building Society. Studies in Sociotechnical change[M].MIT Press,1992:205-224.
10. Xia Baohua. Social Cultural Practice Nature and Direction of Technological Innovation [J]. Studies in Science of Science,2006(4):299-304.
11. Wang Rui and Li Zhaoyou. Social Cultural Function Analysis of Technological Innovation [J]. Journal of Northeastern University (Social Science),2008(3):201.