

Analysis on the Trend of the Industrial Transformation and Upgrade in the Context of Big Data*

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Abstract—The big data technology has been widely influencing the people's production and life and playing a key role in the industrial transformation and upgrade. In the context of big data, where to go and what to do are quite important for the industrial transformation and upgrade either in theory or practice. So, the paper, by analyzing the concerned literature, expounds the digital cultural features in the big data conditions and their influence on the transformation and upgrade of the industry, studies the relative issues to the industrial transformation and upgrade in the circumstance of big data, finally points out the trends for the industry to be further transformed and upgraded.

Keywords: *trend, industrial transformation and upgrade, big data*

I. INTRODUCTION

In recent years, the new-generation information technology like internet, cloud computing and internet of things is evolving fast that a new era-big data era has been produced. The big data have penetrated all ways of life such as production and operation and social life, etc. and attracted much attention. What's more, the big data have become the important engine to drive the industrial transformation and upgrade. In the field of production and operation, the massive data resources produced in the whole life period of product idea, product design, manufacturing, sales and maintenance, etc. concern all sorts of structural and non-structural data like text, image and video. All of these data have an important use value to the industrial transformation and upgrade. In all walks of life, the big data have brought us much convenience and unlimited value due to their magnanimity, extensiveness, economy, accessibility and trace-ability. The industrial transformation and upgrade focuses on a highly integration between information and industrialization, with complex and dynamic natures. How to affect the trend of the industrial transformation and upgrade by the big data has much relationship with the success or

failure for the industry to be transformed and upgraded.

II. FEATURES OF THE DIGITAL CULTURE IN THE CONTEXT OF BIG DATA

The big data [1], with their strong ability of dealing with the massive data, have given us much know-how and technology of economy. In the background of technological economy, the digit has become the main medium with which visible or invisible resources can be dealt, flow and exchanged. In the meanwhile, the digit culture that is changing the human future has been formed. Its features are mainly embodied as follows:

A. Massiveness

With the rapid growth of the information technology, data have been exploding and the storage tool from the class MB to GB to TB to the current PB and EB. Social tools like Twitter, Facebook, WeChat, Taobao, mobile network and various artificial tools have become the main sources of the data, for example, the goods exchange data gets to 20TB in Taobao every day while the daily record in Facebook surpasses 300TB every day.

B. Spiral changing

The technology now and in the future is changing spirally without end. And it is now accelerating its steps. According to the research of the concerned scholar, most important technology only pilots 30 years at most in its field and is obliged to be upgraded successively. Take it for instance, the average life cycle of the application software for the mobile phone is only 30 days. The technology is making us Protopia [2].

C. Variety

Extensive data sources make the form and the content of the big data complex and variable. The big data can be expressed in the form of journal, picture, audio and video, text and figure, etc. In the content, they may be various commercial & productive operational data, human stories, governmental policies, science & technology and human history, etc.

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D. Shooting transmission

Owing to the internet, the transmission of the big data goes like rockets. The big data penetrate our everyday life. We face massive data every day, which need us to deal with them in time. Otherwise, we may be submerged by the data sea.

E. Being both worth and worthless

Being worth is the key feature of the big data. Their value lies in the data digging: among various massive data, new rules and new knowledge may be found out and applied to the industry, agriculture, commerce and medicine, etc. so as to accelerate the scientific and technology research, raise the productive efficiency and improve social governance and our life through exploring the valuable data by such tools as modeling, machine learning, artificial intelligent, etc. However, not all the data coming from the real world are valuable. The valuable data occupy a limited proportion. Some may be worthless for life. According to the concerned statistics, every 12 months, 8 million new songs can be composed and over 2 million new books published out. All these outcomes can't be worthy to everyone. We must select some of them that are most valuable to us.

III. EXPLANATION OF THE INDUSTRIAL TRANSFORMATION AND UPGRADE

According to the relative research, the industrial transformation and upgrade means that the traditional industry is transformed and upgraded and becomes the industry of the advanced technology by adopting such technologies as information, biology, new material and new energy, etc. The transformed and upgraded industry has the features of the industrial form with the replaced core technology & unchanged structure. The connection with the traditional industry and the continuously renewing in technology is its most remarkable and basic characteristics.

IV. INFLUENCE OF THE DIGITAL CULTURE ON THE INDUSTRIAL TRANSFORMATION AND UPGRADE IN THE CONTEXT OF BIG DATA

The endless upgrade in technology under the big data causes a high speedy alternation of the industrial transformation and upgrade.

A. The digital technology is changing our cognition and life

The rapid change and application of the artificial intelligence is making the industry radically changing. What the human being can do can be better done by the robot, for example, complicated fast precise computers and unmanned drone joining in the disaster relief, etc. And the robot can even do what the human being can't do, for example, some high tech medical equipment diagnoses and treats the human body disease, etc. As the new technology is widely used in the industry, not only in the production but also in the service, the artificial intelligence is replacing the human labor. So, the production and operational model in the industry must go with the times. How to use and master the new technology and the artificial intelligence must be pondered into the industrial transformation and upgrade.

B. The digit deliberately shooting in the network is like a double-edged sword to the industry

It gives the industry both benefits and threats. The benefits are embodied as follows: the shooting transmission can give us a free meal by way of endless photocopy, which may cut down the R&D cost of the product. But it is a deadly attack or threat to the original innovation. To solve this problem, the payment from the photocopier is obliged so as to compensate the original innovator. Besides, either the original innovator or the successive innovator should fully investigate the consumer's demand, decompose the product, re-innovate the product in the product line, its depth, its length or product mix.

C. The digital variety is like visibility and accessibility

The digital variety like visibility and accessibility raises the security and high-efficiency of the industrial production and operation. So, the adaptive conditions in the software & hardware and the administrative model, etc. ought to be prepared for the production and operation of the industry

1) *Non-materialization*: The digital of various resources offers us the basic condition of the non-materialization. And the extensive use of the cloud computation and WIFI provides us much convenience to use the data. The service penetrates various aspects of the industrial production and operation, such as payment tool, real time software, mobile phone application, and so on. The industry must be equipped with the digital installations and adopt new business service model.

2) *Establishment of the synergy platform*: By using the new-generation information technology like cloud computing, cloud storage and block-chain, etc. the information service should be set up so that the information service provider, exchange partners, suppliers, carriers and banks, etc. could cooperate each other to fulfill all kinds of exchange activities, just like Taobao.

3) *Raising security*: The digit can make interact and share convenient, which may challenge the safety of the industrial technological innovation. The industry must apply for the patent for its innovative outcomes in time. Besides, another security tool must be looked for, for example, the crowd-funding, a way of collecting the fund around the net partners on the net platform so as to compensate the original creator, such as Kickstarter abroad and Zhuiheng Net and Haomeng Net, etc.

D. The digitalization makes the massive data able to be filtered and followed

This is important for the industry to select and spot the valuable information. It can let the industry find out the real demand and preference of the customer, because whether the perceived value of the brand can meet the customer's preference or not decide whether the outcome can be well sold or not. And also, the filter and track available of the net information can help reduce much marketing cost, for example, once someone surf some product in Taobao

network, a track is left on the backstage and this product will be shown to you for promotion next time when you surf the network.

V. TRENDS OF THE INDUSTRIAL TRANSFORMATION AND UPGRADE IN THE CONTEXT OF BIG DATA

Up to now, the big data have penetrated all the aspects in social economy and life, which leaves tremendously influence on the industrial transformation and upgrade.

First, the digitalization of the market demand drives the digital of the industrial transformation and upgrade. The big data affect the people's clothes, meal, housing and out-going. To satisfy the customer's various demands, the industry must make the outcome and commercial service model digital.

Then, the industrial transformation and upgrade needs the integration between the information and industrialization. The big data, particularly, the industrial big data are the key to the integration. The industrial big data [3] mean the digital resources produced in the life cycle of the product design, making, sale and maintenance, etc. They concern various structural and nonstructural data like text, image and video and so on. They can accelerate a deep integration between the information and industrialization in the industrial chain such as R&D, production, operation, management, marketing and after-sales, etc. as to promote the industry into network and intelligence [4]. They have much actual application value in developing the industry. The key technology of German Industry 4.0 and that of China Making 2015 are the big data technology.

Third, another trend of the industrial transformation and upgrade is to make the industry service. The digital in the field of production will drive the service field transformed and upgraded in the direction of network and intelligence. The development and application of the intelligent making is a process of continuous technological evolution and engineering innovation. The boundary of the traditional industry is being broken through and the new production & operation model and the trans-boundary innovation are full of vigor [5]. Take it for example, the synergy design among spatial, automobile and transportation, etc. the customized in clothing, cars and household, the long-distance operation and maintenance in electrical equipment and engineering mechanics, etc. all show us that the industry of service will be obliged as the big data technology like internet, intelligence and the internet of things, etc.

VI. CONCLUSION

The big data are influencing the social economy faster than ever before. The industrial transformation and upgrade decides the development orientation of the social economy. Although the industrial transformation and upgrade has gone many years and that the big data show themselves in recent years, the latter has greatly affected the former. The industrial transformation and upgrade is obliged to be adjusted on the base of the big data conditions so as to match and fully apply the new technology, new business model, etc. Only this can the big data become the driving

forces and not the obstacles to the industrial transformation and upgrade.

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