

## Research Article

### Food Enterprise Technological Innovation in the Big Data Era

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**Abstract:** With the advent of the era of big data, the issue of “big data” has arisen rapidly from the technological level in food entrepreneurial to the top agenda of national strategies. This study intends to give a basic demonstration of the concept of big data as a starting point and exams the strategic model of food entrepreneurial technological innovation in the context of big data in China through the analysis of the characteristics of big data.

**Keywords:** Big data, food entrepreneurial technological innovation, strategy

#### INTRODUCTION

The advent of “big data” era marks the indication that traditional data mining methodology is no longer able to adapt to the constantly-changing environment and is inadequate in the aspects such as data collection, data storage, data analysis and visualization. Meanwhile, there has been a distinct growth of dependence on data from all walks of life; the quantitative analysis method based on data now intends to be replaced with qualitative analysis method based on experts which requires a large amount of devotion to time and energy. It is under these circumstances that traditional food entrepreneurial technological innovation faces a big challenge. As traditional data mining method and food entrepreneurial technology gradually fail to adjust to the large-scale data which emerges quickly in the field of food entrepreneurial technology and realize timely processing and analysis of such data, it loses the data analysis scheme and ability that help make decision. Therefore, this study intends to put forth the effective way of facing the opportunities and challenges in the “big data” environment, responding to the radical changes brought about by big data to the technological innovation management of traditional food entrepreneurial, from the level of thinking to technology and realizing the goal of decision-making innovation of the technological innovation management in China. It is not only the foothold of this study but the problems it anticipates to solve.

#### MATERIALS AND METHODS

**The basic concept of big data:** Big data is not the aggregation of a large amount of data in traditional

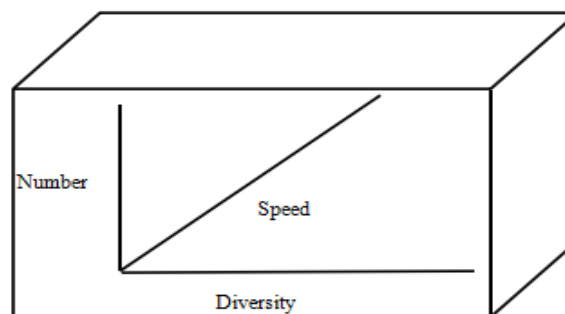


Fig. 1: The 3D growth of data

sense, but a set of information processing technology that entails new data processing food entrepreneurial technology, transferring food entrepreneurial technology and applying food entrepreneurial technology. It is different from mass data in essence, so its characteristics and connotations cannot be explained by mass data. The international information consultation company- Edwards-believes that big data “has surpassed the existing information food entrepreneurial technology to process extreme information resources (Edwards, 2000).” On Wikipedia, big data is defines as “the dataset that cannot extract, analyze and process its content through traditional information food entrepreneurial technology (Dougherty and Hardy, 1996).” NSF defines it as a large-scale, diversified and complicated dataset that is generated by scientific instrument, E-mail, sensor, Internet of things and video and audio soft wares (Rothwell, 1994). Hippel suggests that big data is a dataset whose collecting, storing, managing and analyzing abilities surpasses those of typical database soft wares (Hippel, 1976). Shown in Fig. 1. This definition has two meanings:

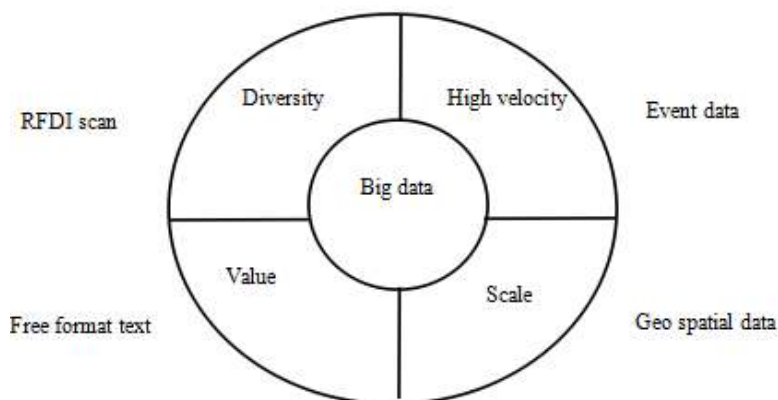


Fig. 2: The characteristics and components of big data

- The size of dataset that is consistent with the standard of big data is changeable and will grow over time and with the advancement of food entrepreneurial technology
- There are some differences among departments in the size of dataset that is consistent with the standard of big data.

**The characteristics of big data:** Big data is of 3Vs, namely, volume, variety and velocity. By volume, it means data volume increases at an unprecedented speed. Big data, larger than the former MB data, is a huge data cluster whose unit transforms to TB and PB. Variety means the types of big data and data source, including structured, semi-structured and unstructured data from traditional and untraditional information source like weibo, texts, journals, sensor data and video and audio profiles (Balthasar and Menke, 2002). Velocity suggests the timeliness of big data. As big data has time effect as regards generation, analysis and application, data stream must be applied to procedures and decision-makings so as to achieve the effect (Reichman *et al.*, 2011). Volume C indicates the value of big data (Toby and Jeff, 2009) Fig. 2. It is the ultimate characteristic of big data and is capable of procuring insight and value. It was due to the food entrepreneurial technology including artificial intelligence, data mining food entrepreneurial technology and machine learning that the advent of big data came into emergence. Food entrepreneurial technology based on big data can transform huge volumes of data to information and make it convenient to make decision and take actions.

**The strategic model of food entrepreneurial technological innovation in the context of big data in China:** “Enhance the innovation ability and build a innovation-driven country” has been the core thought of the future development strategy since the 17th CPC National Congress. In the 18th National Congress, it came up with the great idea of “implementing the

innovation-driven development strategy” (Magoulas and Loric, 1999). Under such circumstances, how to achieve the “innovation-driven development” in food entrepreneurial technological innovation management is an urgent issue demanding to be considered by science and technology workers in China.

Food entrepreneurial technological management entails the whole process from the conceiving, designing, developing, producing of new products and crafts, as well as the developing, recognizing and applying of the market to commercialization. It is a dynamic unity of economic and social coordinated development of enterprise technology, which is composed of interwoven subsystems of input, process, feedback and output. Managing the system requires maintaining and sharpening competitive edges through meeting the increasing and changing demands of customers, so as to achieve the goal of the current and long-term economic benefits and best integrate the inner elements and related resources of companies. As shown in Fig. 3.

## RESULTS AND DISCUSSION

**Management of food entrepreneurial technological innovation resources:** Food entrepreneurial technological innovation resources mainly include fund resource of research and development, instrument and equipment resource related to food entrepreneurial technological innovation, human resource of food entrepreneurial technological innovation and information resource of food entrepreneurial technological innovation. The management of these innovation resources is demonstrated through the source, collection scheme, realization method and the specific prescription and measures of various resources; the accumulation, reservation, update and storage of various resources; the optimal allocation and usage of various resources during the implementation of food entrepreneurial technological innovation; the duties and responsibilities of the departments and staff of various

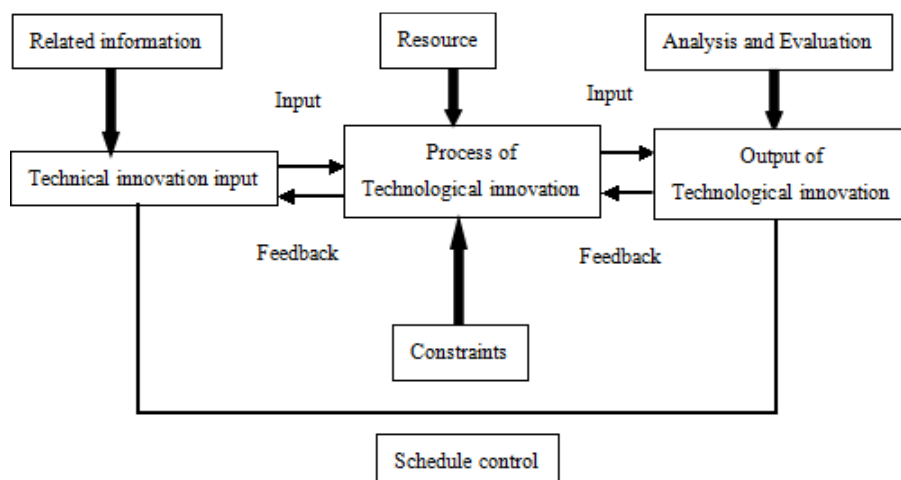


Fig. 3: The macro model of food entrepreneurial technological innovation management

resources; the monitoring and the evaluation of effect while using various resources.

**Decision-making management of food entrepreneurial technological innovation:** The decision-making of technological innovation is the key link to food entrepreneurial technological innovation, which directly affects the risks and final outcome of food entrepreneurial technological innovation. To ensure the scientificity and reasonality of decision-making, companies must:

- Establish a democratic system to ensure the democratic centralism during the process of decision-making and the scientificity of the method of decision-making
- Set up a program evaluation organization including internal and external experts
- Issue a debate about the feasibility of food entrepreneurial technological innovation from the following aspects: market demand, the maturity of food entrepreneurial technology, innovation ability, the scheme of implementing food entrepreneurial technology and the benefits and risks of innovation.

The process of food entrepreneurial technological innovation is an kind of economic activity of high risks, such as the risks of food entrepreneurial technology, market, intellectual property, credit and time. Risk management means to project and analyze the risks during the process of food entrepreneurial technology; make warning as well as evaluation; monitor and control risks; resolve and avoid risks; put forth the remedy measures and scheme; identify the responsibility and reasonable undertaking of risks.

**System management of food entrepreneurial innovation technology:** The system management of food entrepreneurial innovation technology contains the following three systems:

- The specific operation system of various links and procedures during the process of food entrepreneurial technological innovation. As food entrepreneurial technological innovation is a dynamic process of integrating the achievements of researches and market demand, it is bound to have complicated links and procedures. Therefore, it is imperative to systematize and standardize the specific operation and functioning of them to ensure the final innovation outcome
- The management system of coordinating the involved parties of food entrepreneurial technological innovation.

## CONCLUSION

All the countries, companies and research institutions are standing at the same starting line in regard to the research of big data. How to seize the opportunity, face the challenges and obtain a leading position in this fast-changing complex competition environment is the ultimate goal of this research team and all the scientific food entrepreneurial technological innovation workers in China.

## REFERENCES

- Balthasar, H.U. and M.M. Menke, 2002. Quantifying and forecasting exploratory research success. *Res. Manage.*, 125: 14-21.
- Dougherty, D. and C. Hardy, 1996. Sustained product innovation in large, mature organizations: Overcoming Innovation-to-organization problems. *Acad. Manage. J.*, 39: 1120-1153.
- Edwards, T., 2000. Innovation and organizational change: Developments towards an interactive process perspective. *Technol. Anal. Strateg.*, 12(4): 445-464.

- Hippel, E.V., 1976. The dominant role of users in the scientific instrument innovation process. *Res. Policy*, 5(3): 212-239.
- Magoulas, R. and B. Lorica, 1999. Introduction to Big Data. Release 2.0, Issue 11, O'Reilly Media, Sebastopol, CA.
- Reichman, O.J., M.B. Jones and M.P. Schildhauer, 2011. Challenges and opportunities of open data in ecology. *Science*, 331(6018): 703-705.
- Rothwell, R., 1994. Towards the fifth-generation innovation process. *Int. Market. Rev.*, 11(1): 7-31.
- Toby, S. and H. Jeff, 2009. *Beautiful Data: The Stories behind Elegant Data Solutions*. O'Reilly Media, pp: 257, ISBN: 978-0-596-15711-1.