

The Distinction between Basic and Applied Research – Did Vannevar Bush Described a Truth or Create It?

Author: Shin-Jye Lee¹; Ching-Hsun Tseng²; Hsueh-Cheng Liu³

Affiliation: Institute of Management of Technology, National Chiao Tung University, Taiwan¹³;
Department of Computer Science, University of Manchester, United Kingdom²

E-mail: camhero@gmail.com¹; hank131415go61@gmail.com²; stdm11528@gmail.com³

DOI <10.26821/IJSHRE.9.1.2021.9118>

ABSTRACT

The distinction between basic and applied research was a significant issue in the twenty century proposed by Vannevar Bush, and which partly brought the deep thinking between technology and policy in U.S. To validate the truth of the contention proposed by Vannevar Bush, this work mainly puts focus on making a scientific discussion based on the innovation view by inductively examining the linear model proposed by Vannevar Bush. In addition, this work also proposes a solid recursive model of science research in the twenty-one century for finalising the conclusion of science research.

Keywords: : Basic Research, Applied Research

1. INTRODUCTION

Based on the features of science research works, Vannevar Bush [1], an American science administrator, stated that the science research works can be generally divided into two primary categories, including basic research and applied research. Meanwhile, basic research works aim to purely discover and understand undeveloped or developing knowledge. However, the applied research works primarily consider the demands for practical use or the considerations of commercial benefits. To strongly reinforce the statement, Vannevar Bush represented a

linear model to illustrate the relationship between basic science and applied science, and which can be described by [2]

Basic Research → Applied Research → Development
→ Production or Operations (1)

In (1), the model starts from Basic Research and ends at Production or Operations, via Applied Research and Development successively. So far as a solid basic science research work is concerned, it has to consist of theoretical evidence and practical evidence. The theoretical evidence indicates that the reasoning or mechanism of the primary theory is completely logical and reasonable, and the practical evidence means that the results of corresponding simulations or experiments are positive and robust together. Meanwhile, as the achievement of basic research works can remain consistent in the demands for practical use, perhaps the basic research is converted to applied research by iteratively improving the reliability of the basic research. Also, the development can be completely built till the achievement of applied research is mature, and the production or operations are carried out based on the development afterwards.

2. RECURSIVE METHODOLOGY

Through the inductively examination, the linear model proposed by Vannevar Bush is truly reasonable in the twenty-century. By other means, the definite separation between basic and applied research

proposed by Vannevar Bush is positively reasonable. However, with the rapid development of science and technology in the twenty-one century, the model is not linear and becoming more diversity, and which can be illustrated as follows:

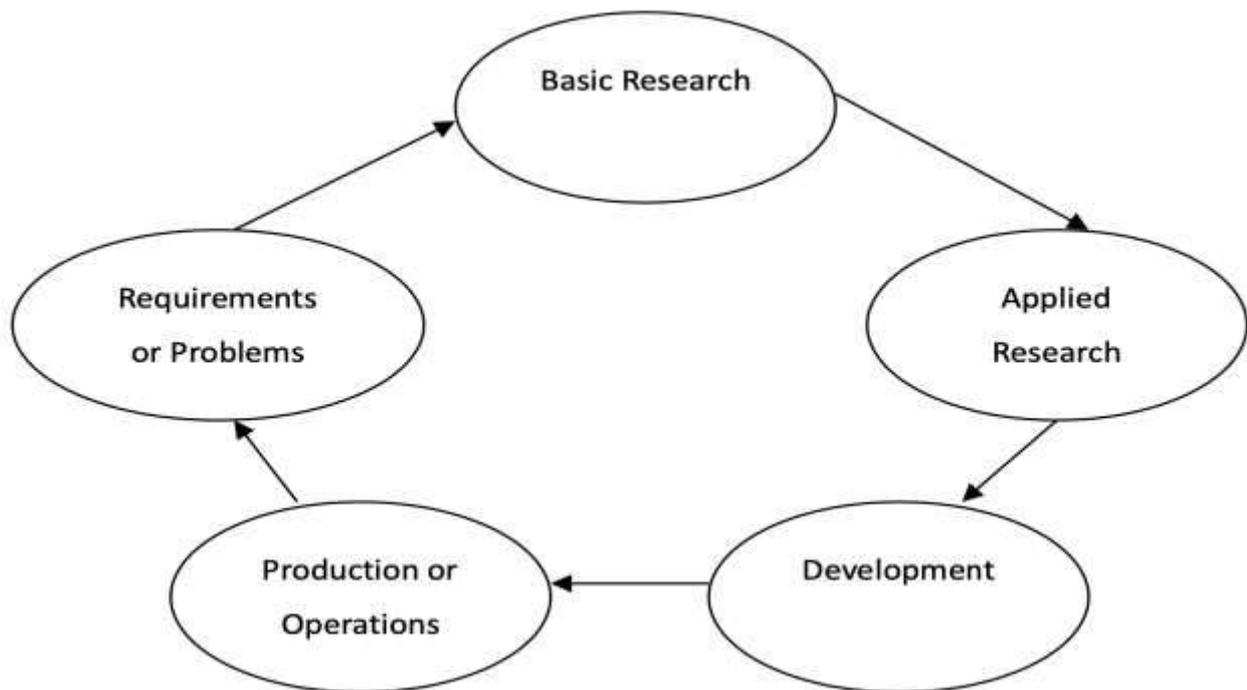


Fig 1: The Recursive Model of Innovation in the Twenty-One Century

In Figure 1, the type of model is recursive, as the science research has been upgraded to an iterative procedure in the twenty-one century. In addition to the above, the difference between the recursive model and the linear model proposed by Vannevar Bush is there is one more component – Requirements or Problems in the recursive model. Also, the appearing of “Requirement or Problems” basically results from new requirements or latent problems deriving from “Production or Operations”, and which may be the potential of “Basic Research” in the recursive model.

3. CONCLUSION

Did Vannevar Bush describe a truth or create it for the distinction between basic and applied research? Based on the view of innovation in the twenty century, the

answer is positive with the inductive examination. However, it is not positive enough in the twenty-one century, because the science research is more dynamic and diversified with the iterative procedure.

4. REFERENCES

- [1] Vannevar, Bush, (1945). *Science: The Endless Frontier : A Report to the President by Vannevar Bush*. U.S. patent application.
- [2] Donald, E. S., (1997). *Oasteur's Quadrant*, Washinton, D.C., Brookings Institution Press.