



PDCA-Based Management of Corporate Research Integrity and Ethics

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Abstract. In recent years, research integrity and research ethics have received national and world attention, and people from all walks of life have carried out research on various aspects of research integrity and ethical approaches, but research on research integrity and ethics in companies is still very scarce. This paper provides an example of a PDCA-based approach to research integrity and ethics management for SouthNet, and briefly explains what is involved in carrying out the management to provide advice and assistance for the management of research integrity and ethics in companies.

Keywords: research integrity and ethics · management · PDCA

1 Introduction

Research integrity and ethical management have been the focus of national attention in recent years. Research integrity refers to the need for researchers to be truthful, not to cheat, not to falsify, and to abide by scientific values, scientific spirit and codes of conduct for scientific activities; science and technology ethics are values and codes of conduct to be followed in scientific research, technology development and other scientific activities, and are important safeguards for the healthy development of science and technology [1]. They play a crucial role in scientific research activities: scientific integrity is the “cornerstone” of scientific innovation, and scientific ethics is the “bottom line” of scientific action [2].

At the same time, the Rules for Investigation and Handling of Scientific Research Breach of Trust have added seven types of scientific research breach of trust [3], and the Opinions on Strengthening Ethical Governance in Science and Technology clearly state that ethics in science and technology is a value concept and code of conduct to be followed in carrying out scientific research, technology development and other scientific and technological activities, and is an important guarantee to promote the healthy development of scientific and technological undertakings [1]. Moreover, research integrity and ethical management can have an impact on the company’s image and profitability in many ways. Therefore, this paper will take China Southern Power Grid Corporation as an example and propose corresponding measures for its research integrity and ethical management.

2 Corporate Research Integrity and Ethics

After sorting out the existing management contents of the company's scientific research integrity and ethics, the sorting and summarizing concluded the issues related to the company's scientific research integrity and ethics.

2.1 Management Body Responsibilities Are Not Clear, the Specific Investigation Process Is Vague and Generalized

Currently, management content on research integrity and ethics already exists within the company, such as the inclusion of scoring content on research integrity in evaluation templates such as the post-evaluation work of science and technology projects; the definition of some research integrity violations and the clear handling of different violations; and the requirement that recognition and awards should be truthful and objective, without falsification or plagiarism or misappropriation of others' achievements. However, in practice, there are problems such as insufficient professional level of managers in integrity and ethical review, vague division of authority and responsibility, and lack of communication and synergy, resulting in review and supervision and penalty requirements for violations easily becoming formal and lacking in implementation.

2.2 There Are Blind Spots in the Governance of Research Ethics Regulation

At present, there is no management of scientific research ethics in all the systems and regulations of the Company's innovation activities, and the overall awareness of scientific research ethics among researchers is late, and a perfect and mature scientific research ethics supervision system has not been established, and ethical regulations need to be clarified, and mechanisms for review and supervision and punishment of violations need to be established.

2.3 Poor Collaborative Management

The company has a clear definition of integrity violations, and according to the severity of the circumstances, the corresponding penalty provisions for violations, but has not yet established an effective integrity rating information file, joint discipline, credit incentives and other collaborative governance means can not be carried out based on this construction, such as failure to take good scientific research integrity as a necessary condition for project declaration, award declaration, title declaration, etc., the use of cross-departmental and unit information monitoring and early warning work can not be carried out effectively.

2.4 Publicity and Education Need to Be Strengthened

At present, the company does not carry out systematic, normative and practical publicity and education on integrity and ethical issues for the time being. As the main executor of scientific research activities, the integrity, ethical awareness and moral enhancement of

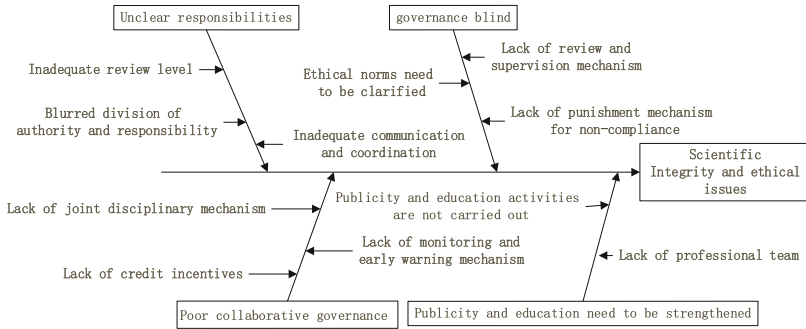


Fig. 1. Current state of corporate research integrity and ethics

personnel who are the subjects of scientific research activities have been the consensus of the country and society, and there is an urgent need to strengthen the development of targeted publicity and training and other efforts.

Current state of corporate research integrity and ethics is as shown in Fig. 1.

3 PDCA-Based Corporate Research Integrity and Ethical Management

3.1 Management Management Model Combing

This paper proposes to select a management approach to develop a research integrity and ethics management system, and Five management approaches are listed below.

Method I. 5W2H

5W2H consists of seven questions, namely Why, Who, When, Where, What, How and How much. Its simplicity, convenience, ease of understanding and use, and enlightening meaning are widely used in business management and technical activities, and are also very helpful for decision-making and executive measures of activity, while helping to compensate for omissions that occur when considering problems [4].

Method II. 6σ

6σ is a set of scientific management methods with different execution processes, such as DMADV, i.e. Define, Measure, Analyze, Design, Verify.

Method III. The Juran Trilogy

The Juran trilogy introduces the Pareto principle into the management process, covering: quality planning, quality control and quality improvement, and is applicable to quality management.

Method IV. Zero-Defect Management

“Zero-defect management” refers to the aim and goal of reducing errors in our work by ensuring that defects in all aspects of our business processes tend to be “zero” through all-round management of all aspects of our business processes.

Table 1. Scenarios for the application of management science methods

Management Methodology	Applicable scenario
5W2H	Business management and technology activities
6 σ	Process variation
The Juran Trilogy	Quality Management
Zero Defect Management	Reduce defects in business work
PDCA	System Design

Method V. PDCA

PDCA is divided into four stages, namely plan, do, check and action. The meaning is that the four stages are cycled back and forth in order, in which the problems are continuously identified, then solved, and then the unsolved problems are identified to follow the cycle of the above four levels, and the main feature is that the process of the cycle is not constant, but is stepped upward [5].

The application scenarios of the five methods are as shown in Table 1.

3.2 Management Model Selection

In the process of research integrity and system building, 5W2H is considered comprehensively but its implementation can lead to unknown and difficult to answer questions in detail, making the method useless. 6 σ is more applicable to product development and, due to its high level of difficulty, improvement is difficult to achieve. The Juran trilogy applies to the quality management of a company's products and services; zero-defect management focuses on reducing defects in a company's work.

To sum up, PDCA is the most suitable method. PDCA has the advantages of having goals, plans, implementation situation and progress, being able to correctly implement to departmental responsible persons, timely identification of existing problems and timely solutions. At the same time, it is simple to understand and easy to operate. PDCA can help the company to determine the objectives of the construction of research integrity and ethics management system, clearly formulate plans and implementation plans, help all departments of the South China Network Company to implement the corresponding responsibilities of research integrity and ethics management, and also be able to check the whole process to identify problems and correct them in a timely manner.

3.3 PDCA-Based Management System for Company Research Integrity and Ethics Management

P is the management planning link, which includes three parts: clear objectives, responsibility guarantee and institutional guarantee. The objective is to set clear objectives and strategies for the company; the responsibility is to establish a system of responsibility for research integrity and ethics with clear responsibilities, hierarchical levels and collaborative governance; and the system is to build a comprehensive system of institutional safeguards for research integrity and ethics for the company.

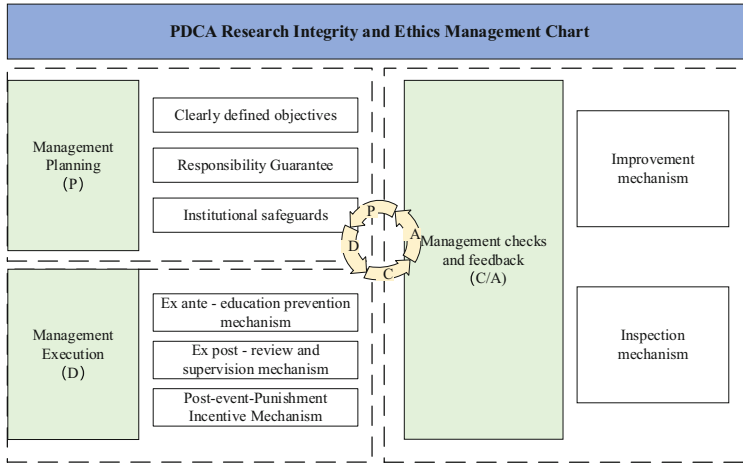


Fig. 2. PDCA Research Integrity and Ethics Management Chart

D is the management and implementation link, which includes education and prevention mechanism beforehand, review and supervision mechanism during the process and punishment and incentive mechanism afterwards. The ex-ante education and prevention mechanism includes education and training and publicity guidance, the ex-post review and supervision mechanism includes review and implementation and monitoring and early warning, and the ex-post punishment and incentive mechanism includes non-compliance disposal and trust incentive.

C/A is the management inspection and improvement link, including inspection mechanism and improvement mechanism, where the inspection mechanism should be carried out in accordance with the internal audit of the innovation management system, and the improvement will be further implemented according to the inspection results, closing the loop to improve the content of “management planning”.

The whole process of “PDCA” requires management support, which includes confidence and human resources support. Information resources support may include building a database of integrity rating information, building a database of ethical issues and sharing information online, while human resources support may include setting up education and training teams and hiring professional assessment experts.

PDCA research integrity and ethics management chart is as shown in Fig. 2.

4 Summary

Firstly, this paper defines research integrity and research ethics, and lists the relevant national policies and regulations to point out the importance of research integrity and ethics management. Secondly, from the Southern Power Grid Company, the existing problems of research integrity and ethics within the company are sorted out and summarized. Then, six types of corporate management methods are listed, and PDCA is selected as the underlying management logic for the system building of corporate research integrity and ethics through a comparative analysis method. Finally, a brief

description of the PDCA implementation and the direction of the subsequent work to be carried out to provide the company with recommendations for the management of research integrity and ethics.

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