

## Business Report FY2017

### 1. General

During 47 years since its establishment, the Institute for Future Engineering (IFENG), a first-generation think tank in Japan, has continuously been trying to gain an insight into the developing tendency of science and technology and into socioeconomic changes, to identify issues and their solutions for a desirable future on the basis of engineering methodologies, and to propose ways how science and technology solve possible problems. The fiscal 2017 concludes the fifth year of IFENG as a public-interest corporation. Efforts to achieve a capability commensurate with the status of the institute have resulted in 70 researchers (mostly part-timers) compared with the initial 34. Synergy of the newly hired part-timers with different backgrounds with the full-time researchers who have got accustomed to the new management system has led to a variety of commissioned works and has expanded the business to include independent nonprofit projects. Meanwhile, IFENG obtained for 2017 the fourth place in the GGTTI think tank ranking in the science and technology area, following the eighth in 2012 and 2013, the sixth in 2014, and the fifth in 2014 and 2015. However, the financial position of IFENG is not strong enough: the immediate priorities for the institute are expansion and stabilization of the business and improvement of skills of the expanded part-time research staff.

IFENG's article of incorporations define its activities in three categories<sup>1)</sup>: investigations in the area of future engineering, interaction with the public related to future engineering (publicity, services, etc.), and international exchange related to future engineering.

The activities of a public-interest corporation are to be classified into nonprofit (N) and for-profit (F) ones. The former is intended for the general public, while the latter is for specific parties.

### 2. Business-related activities

For explanations in this section, the N and P activities are further divided into three each: (1) commissioned investigations (investigations driven by commissions or subventions

by other parties), (2) independent investigations (investigations relying on its own fund), and (3) interactive research<sup>2</sup>). Individual details are presented below. Activities related to international exchange are described in the last paragraph without differentiating N and P categories.

A total of 43 projects were implemented in FY2017, including two continued from the preceding year and four to be continued in the next year. Thirty-nine were thus concluded within the fiscal year and considered in the account settlement.

The current contract-based projects include 17 for N1, 21 for P1 and 1 for P2. In addition, two each of N2, N3 and P3 projects have been performed. One of the two N2 projects is to be transferred to the N1 category within the current year; the other also to the N1 category (financed by a private body) in the coming year.

#### (1) Commissioned investigations

Of the 38 projects completed in FY2017, seven were subventiary: two supported by the private sector (Watanabe Memorial Foundation for the Advancement of New Technology), four subsidized by the Grants-in-Aid for Scientific Research ("Kakenhi", Japan Society for the Promotion of Science)(including joint investigations), and one by the Ministry of Foreign Affairs; the remaining 31 were commissioned projects<sup>3</sup>).

The commissions came from six governmental agencies for 11 projects (compared with 12 in the preceding year, the same hereinafter), three government-run institutions for 6 (14), two universities for 4 (4), and eight business companies for 10 (17). The commissioning government agencies included the Cabinet Office, the Ministry of Education, Culture, Sports, Science and Technology, the Agency for Cultural Affairs, and the Ministry of Economy, Trade and Industry. Other commissioning parties included Japan Science and Technology Agency and other national research institutes, as well as the University of Tokyo. The four projects to be continued to the next year consist of a subventiary project and three commissioned ones.

In terms of the business categories, 17 projects belong to nonprofit activities and 31 for-profit activities (F1).

(2) Independent investigations

(i) Independent nonprofit investigations (N2)

The self-financed nonprofit independent investigations carried out in 2016 included preparatory works for supporting commissioned projects (original concepts) and studies by full-time researchers to expand their knowledge.

An example of the preparatory works is a new subventionary project “The Current Status of Japan’s Scientific and Technological Capability: reality and challenges”, for which researchers apply and enhance methodologies they have acquired as think tank members. Another subventionary project “Investigations on the Limitations of the Third-Generation Artificial Intelligence Based on Deep Learning” exemplifies expansion of researchers’ knowledge, in which they examine limitations of deep learning and perform conceptual design of next-generation artificial intelligence for uncharted future beyond such limitations.

(ii) Independent for-profit investigations (F2)

The independent for-profit investigations included two projects (consulting) to support business companies' activities related to science and technology based on IFENG’s existing knowledge.

(3) Interaction with the public

(i) Nonprofit interaction with the public (N3)

The activities below started in 2015 to feedback the research outcome of IFENG to wide public:

(a) In an SNS-based publicity program, IFENG’s official Twitter account was established along with accounts for individual projects. It is intended to familiarize the public with the research outcome of the institute and to encourage their access to essential issues by

inviting the followers of the accounts to visit the official IFENG website, particularly the “Insight” and “Forum” sections. Experiences obtained in the projects implemented in FY2015-16 were helpful.

(b) Publication of Annual Report 2017 and expansion of the English pages in IFENG’s website were realized along with individual researchers’ publication of their research results and presentation of their views in a number of printed media, conferences, meetings and seminars.

(ii) For-profit interaction with the public (F3)

Activities in this category included support of Aviation Forum and publishing (five copies of the MEXT Report of the 9th Science and Technology Foresight were sold).

(4) International exchange

Three study groups from China and Taiwan visited IFENG in FY2017.

A total of 21 researchers visited the US, Canada, Britain, Germany, France, Australia, Sweden, Finland, Singapore, Vietnam, China, Taiwan and Republic of Korea for their investigations.

Notes

1) Article 4.

2) These categories are hereinafter represented as N1, N2, ..., P1, P2, etc.

3) Investigations supported by subsidization from subventionary funds are called “subventionary”; those based on other financial sources are “commissioned”.