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**Recollection of My KAKEN-HI Supported Research Life**

**By Hirochika Inoue**

**Professor Emeritus, University of Tokyo**

**Former Inspector General, Japan Society for the Promotion of Science**

**Research Advisor, National Institute of Advanced Science and Technology (AIST)**



After obtaining a doctorate through my research on computer control of artificial hands, I entered the Electrotechnical Laboratory(ETL) of the former Ministry of International Trade and Industry, as a member of an intelligent robot research project. Specially promoted in ETL, this project sought to explore new technologies with industrial application. Looking back at that project from today's perspective, we enjoyed a great degree of freedom in carrying out our research; and even as government employees, we felt neither regulated nor managed in pursuing our work. It was during the period of Japan's rapid economic growth, and for our lab we used an old building in Nakata-cho, Tokyo's governmental hub. Assembling young researchers, the place brimmed in a boldly ambitious atmosphere. Though not as much as American universities, ETL had considerably more research funding than did Japanese universities. The projects brought together colleagues from wide research background, including electronics, mechanical engineering, computer science, control engineering, and mathematics, who in competition with researchers around the world, worked to advance pioneering research on intelligent robots. The eight years that I spent concentrating on my own research within that project were for me a most valuable experience.

In 1978, I moved to the University of Tokyo, where I was appointed as an associate professor in an information systems lab, graduate course of information engineering department. The lab director Prof. Shigeru Watanabe told me, "Create a Systems Engineering of your own" , while my Doctoral thesis advisor Prof. Sumiji Fujii advised me, "Students with excellent talent will gather, but never make them mediocrity." This encouragement and freedom they gave me meant that I had to think from the start about everything related to my research, including its direction, approach and long-term planning as well securing research funding. This is when I first encountered Grants-in-Aid of Scientific Research (Kaken-hi). From that time until my retirement from the University of Tokyo in March 2004, most of my research activities enjoyed the support of Kaken-hi, including JSPS's "Research for the Future Program."

Kaken-hi were the most important source of funding in setting research themes and drafting implementation plans in my lab; our research schedule proceeds as if it were driven by the Kaken-hi event calendar. We needed to prepare our grant applications by the end of September, which meant deciding upon the particulars of our next year's project and compiling the required application documents. With good themes, it was easy to write research proposal straightforward. When the content of our plan was weak, we'd have to rethink it and our strategy. If we received a success notice in late April, we could embark upon the Golden Week holiday with a jubilant feeling. Over the summer holiday, we were able to start using our grant funding. Then, fall through winter would be the most vivid period of our research. Any remaining materials had to be purchased by February, and a research report prepared by early March. When the lab had multiple grants with different research categories and periods, these tasks made us very busy. That couldn't be helped as what we were doing was trading breathing room for ample grant funding in carrying out our research. It would be a matter of life or death if our stream of funding was to be interrupted. Kaken-hi gives researchers a sense of seasonal variation along with a healthy dose of tension.

There has been some criticism about the Kaken-hi application form, that it is too short and simple compared to those of other countries. However, from the viewpoint of both applicants and reviewers, I found them to be just about right—not too simple or complex. It is a challenging enough task to clearly articulate all the information required in the limited space provided on the application form. These include the research objective, its transition, to-date results, preparation stage, plan and methodology, result applications and societal contributions, budget plan, and record of research achievements. When teaching students in doctoral courses, I would have them do a practice exercise of writing application documents for a Kaken-hi on each of their own research themes. It gave them a good chance to objectively assess their own research while preparing them to be independent researchers. Many of the students who took those classes later said how useful this exercise turned out to be for them when submitting their own grant applications.

Looking back over the course of my experience as a young researcher at AIST, particularly in its large-scale, joint research project to pioneer new technologies, my Kaken-hi supported research at the university, and my experience in directing a national R&D project on robotics implemented via a university-industry-government consortium, I am very thankful for the support I have received from Kaken-hi. At the same time, however, I feel there to be shortcomings in its function: There are subtle differences in the perceptions of researchers doing basic research vis-a-vis those doing research aimed at meeting societal demands. The humanities, social sciences, biology, physics, and engineering have varying value systems. A difference sense of time exists between curiosity driven researchers and those in fields under fierce international competition. Accordingly, it is difficult to treat all researchers uniformly.

There are also problems related to the operational framework of the Grants-in-Aid of Scientific Research Program. Rather than an expansion of research funding, I believe more emphasis should be stand on the program's concept of supporting bottom-up research initiatives. Whether in the physical sciences, engineering or social sciences, I believe there needs to be a new grant category that allows researchers to advance curiosity-driven, basic research over long periods in a calm and steady manner that befits the university. For that purpose, it should be permissible to lengthen the period of support by reducing the researcher's annual grant allocation while maintaining his overall grant amount. This suggestion is premised on the grantees' willingness to endure long periods of tension if their research does not pan out as divined.