

# Implementation of the University–Industry Collaboration at NTHU in Taiwan

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**Abstract** — National Tsing Hua University (NTHU) established the Office of University – Industry Collaboration in 2008. The Office coordinates the Division of Industrial Cooperation, the Center of Innovative Incubator, and the Division of Intellectual Property and Technology Licensing to a single contact window to actively and effectively implement the industrial academic cooperation in the campus. Owing to the effort of the Office staffs, the achievements of industrial academic cooperation are remarkable. At present there are three well-known IT companies setting joint research labs in the campus. NTHU provides guidance for commercialization of R&D results and venturing activities. NTHU also scheduled to establish a joint research center to invite world’s top researchers to participate in the study on industrial academic cooperation research and advanced technology development. The Center of Innovative Incubator has had outstanding performance. It has successfully incubated 8 IPO companies, ranked No.1 and accounting for 18% of 45 IPO firms incubated in Taiwan over the past 13 years, representing a market value of NT\$50 billion at the peak of the security market. The Office also proactively explores patentable technologies and provided high service quality for the patent counseling and analysis. The U.S. patents obtained from 2007 to 2009 were 20 respectively, ranking the top among universities in Taiwan. Based on the accomplishment, NTHU aims for becoming the renowned universities in the world, in industrial academic cooperation. The success of university–industry collaboration will play a key role for Taiwan’s future competitiveness, NTHU will keep moving forward in this direction.

**Key words** — collaboration, industry, Tsing Hua University, Taiwan.

## STRATEGIC OBJECTIVES

In 2008, NTHU focused on the adjustment of the organizational structure of industrial academic cooperation, recruitment of professionals for enhancement of service quality, amendment to industrial academic cooperation related rules, and the establishment of incentive measures to create a friendly industrial academic cooperation campus in an active manner. In 2009, a single contact service window of industrial academic cooperation was officially inaugurated, and a cross-campus regional platform for industrial academic cooperation will also be created. Key projects for 2010 include the establishment of venture counseling services and the Angel Fund Investment Team, guidance and encouragement for students and professors preparing venture business, integration of industrial academic service achievements in Taoyuan, Hsinchu and Mioli, and realization of global development..

## ORGANIZATION ASPECT

The NTHU Innovation Incubator Center has had outstanding performance. This Center has been consecutively awarded the best incubator by SMEs (small and medium-sized enterprises) for the past five years and was awarded the best venture guidance prize last year. In addition, the Center has successfully incubated 8 IPO companies, ranked No.1 and accounting for 18% of 45 IPO firms incubated in Taiwan over the past 13 years, representing a market value of NT\$50 billion at the peak of the security market. GEMTEK and ADVANCED ANALOG TECHNOLOGY, incubated in this Center, were awarded “leader enterprises” by the Ministry of Economic Affairs in 2009 (only four have been awarded nationwide). To improve the Innovation Incubator Center’s functionality, we passed the proposal of promoting the Center to the next level up at our university’s board meeting last year, expressing our great esteem for the Innovation Incubator Center. The area of the Center is about 3300 square meters with 25 resident firms now. In the future, it is expected to build a new operation building block of 10,000 square meters in the Center for cultivation of more venture businesses. To establish a sustainable operation model for industrial academic cooperation as well as streamlined integration and separation, the NTHU Research and Development Office has set up a single contact window for the Industrial Academic Cooperation Office, the Innovation Incubator Center, and the Division of Intellectual Property and Technology Licensing

("DIPTL") to make the best use of the performance incentive grant from the Ministry of Education for successful promotion of industrial academic cooperation related activities.

## **LEGAL AND REGULATORY ASPECT**

To achieve various indicators for the performance incentive program by the Ministry of Education, NTHU has modified industrial academic cooperation related rules and incentive measures. In 2009, NTHU has completed the amendment to the Details for Recruitment of Industrial Academic Cooperation Personnel and the development of the Details for Promotion of Industrial Academic Cooperation Personnel. Now we are drafting the Disciplinary Procedure for Industrial Academic Cooperation Professionals. NTHU follows some renowned universities – University of California, Irvine, which has R&D output about 95 times that of NTHU; and Carnegie Mellon University, about 375 times that of NTHU. There will be still much room for improvement in the growth of industrial academic cooperation. We specially appreciate tremendous support from the Ministry of Education for our industrial academic cooperation program

## **RECRUITMENT OF PROFESSIONALS**

To effectively promote industrial academic cooperation, we appointed the NTHU R&D Deputy Dean to serve as the CEO (Chief Executive Officer) of "Industrial Academic Cooperation Office" concurrently, managing affairs of industrial academic cooperation at NTHU. For intellectual property and technology licensing, we have recruited a manager and legal executives to help advance activities in this field. For expansion of existing services, the NTHU Innovation Incubator Center has newly recruited a manager and several staff.

## **ENHANCEMENT OF SERVICE QUALITY**

In 2008, NTHU cooperated for the first time with patent offices and intellectual property organizations to proactively explore patentable technologies and provide patent counseling and analysis. Currently we have 10 partner companies, effectively helping our R&D staff apply for over 90 patents both in Taiwan and abroad. We obtained 20 U.S. patents from 2007 to 2009 respectively, ranking the top among universities in Taiwan. In contrast with only 5 U.S. patents before, the NTHU's patent applications and outputs have been considerably improved. NTHU also participates in the Taiwan Technology Marketplace conducted by the Industrial Technology Research Institute of Taiwan (ITRI), in the hope of accelerating the University's application of patent technology in the industry by combining resources in proximity. Furthermore, based on data such as pending applications or patents obtained recorded in the University, the NTHU Innovation Incubator Center takes initiative to inquire students or professors about their willingness to engage in venturing activities. The Center also gives assistance to resident firms in finding qualified university labs that will meet their technology demand.

## **CREATION OF AN INDUSTRIAL ACADEMIC COOPERATION FRIENDLY CAMPUS**

NTHU has founded an outstanding industrial academic cooperation award since 2006. There are 10 professors granted the award over the four years. We have also initiated high-tech venture business and operation courses for students and held summer camps. Besides, we have invited professors at College of Technology Management to give lectures for companies residing in the incubator center. In 2007 the Center for Creativity and Innovation was established to take charge of organizing the campus creative competition and incentive plans. We also invite specialists from the industry for accreditation and guidance to awarded students. DIPTL also assists winners of the competition in applying for patents, aiming to foster innovation in the campus. NTHU has organized diversified IP (intellectual property) sessions and developed an intern manager system for the incubator center, providing students with an internship opportunity and helping them enter the incubator for start-up business.

## **DERIVATIVE INDUSTRIAL ACADEMIC BUSINESS MODEL**

NTHU has successfully fostered a campus business model. TinnoTek Ltd., for instance, was an R&D team led by Professor Shi-Yu Huang at Department of Electrical Engineering of NTHU, who joined NSC-sponsored U-SPIN program hosted by Dean Chin-Tay Shih, College of Technology Management of NTHU. The University initiatively assisted the team in entering the incubator, fundraising and running as a corporation. In addition, there were R&D teams consisting of professors and students that started up as companies in the incubator; Memsmart Semiconductor is a good example. The Center for Creativity and Innovation also offers counseling services to groups with creativity and provides diversified development models and multiple channels for admission to the incubator. Different from the previous single application system, this incubation approach can proactively identify creative R&D teams to build an innovative business development model.

## OTHER INDUSTRIAL ACADEMIC PROGRAMS

This year the National Science Council gives incentives to “Project Foresight Taiwan” for the first time. There are six projects eligible for the incentives; four of which are related to NTHU. One of these projects is conducted by Professor Tsung-Shune Chin, who has retired from NTHU, and the technology also comes from R&D achievements of Tsing Hua University. NTHU has established a guidance task force to encourage commercialization of cutting-edge academic research results and motivate campus business.

Besides, NTHU also provides guidance for commercialization of R&D results and venturing activities. At present there are three IT companies setting joint labs in the University, including MEDIATEK’s embedded system, DELTA’s industrial academic cooperation R&D plan, and NOVATEK’s System on a Chip. The University is scheduled to establish a joint lab nearby TSMC Building at NTHU (south campus) and invite world’s top researchers to participate in the study on industrial academic cooperation research and advanced technology development.

U-SPIN is a program sponsored by the NSC involving commercialization and venture business, with joint participation of researchers from colleges at NTHU such as College of Electrical Engineering and Computer Science, College of Technology Management, College of Life Sciences, College of Nuclear Science, and College of Engineering. The program has successfully enabled five teams to commercialize technologies through the three-year study period, promoted student entrepreneurship, and completed 15 patent analyses and campus patent inventory categorization. It has also proposed suggestions for patent portfolio. The program has also successfully transformed campus technical teams into derivative companies (e.g. TinnoTek Ltd) and helped them enter the incubator.

## CONCLUSION

The brief introduction given above is about NTHU’s industrial academic cooperation achievements. However, compared to Carnegie Mellon University and University of California Irvine, whose R&D outputs are 375 times and 95 times that of NTHU mentioned earlier in the speech, we have more room for growth in the future. Except for the internal change, we should also introduce external enterprises into the campus; hopefully, the government can offer more incentives to these partners committed in research with NTHU. Some of the NTHU partner companies are profitable and some are still seeking suppliers. In order for more company owners to participate in industrial academic cooperation, we recommend the Ministry of Education to encourage more enterprises to participate in campus industrial academic cooperation by offering incentives. This will play a key role for Taiwan’s future competitiveness. Since U.S.A. has already seen remarkable success in this regard, I believe we should also move forward in this direction.



Figure 1 Center of Innovative Incubator celebrated its 10<sup>th</sup> anniversary with outstanding incubation enterprises in 2008



Figure 2 NTHU was awarded the best University-Industry Collaboration Organization by the Chinese Institute of Engineers in Taiwan in 2009