Life Sciences IT Environment Nanotech/Materials

Sapporo IT Carrozzeria Cluster

Sapporo

Creating a human-centered manufacturing IT production base

Cluster Vision

In order to stimulate regional industries and revitalize the economy, the Knowledge Cluster Initiative in the Sapporo region aimed, along with creating globally competitive technologies and products, to develop a "Manufacturing IT Workshop" production base that rapidly creates prototypes of quality IT products by combining the regional IT companies' software development expertise with research conducted by academia in the region, such as next-generation embedded information devices and unique simulation technologies by the Graduate School of Information Science and Technology, Hokkaido University; usability or human-centered design by the Otaru University of Commerce; and industrial design by Sapporo City University in order to create a group of companies or a cluster for increased business opportunities.

Project Overview

R&D was conducted in the industrial field of IT from FY 2002 through FY 2006 to achieve the "Creation of Sapporo IT Carrozzeria" (Combining IT element technologies with design, usability, and other industrial design techniques) as its Knowledge Cluster Initiative, and educational programs were conducted to transfer the R&D results to companies and engineers in the region. In order to realize sustainable development of the cluster tied with regional industries, the project was reviewed and its promotion structure was enhanced according to the intermediate evaluation in FY 2004.

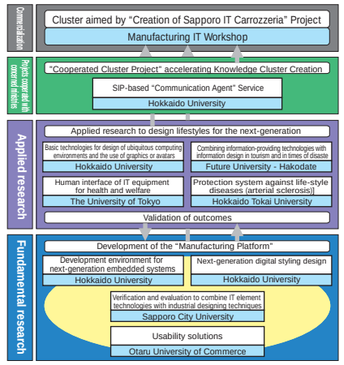
The objective of this project was to create a system that enabled the IT companies in the region to rapidly create prototypes of quality products through a regional joint venture system.

In line with this objective, the final goal was set at developing a system "Manufacturing Platform" to rapidly create prototypes of easy-to-use, quality IT products.

Since the launch of this project in this region, R&D in the project was categorized into two types of research: "fundamental research" to develop the "Manufacturing Platform," and "applied research" to apply the fundamental research findings to creating prototypes. In FY 2005, the "Industrial Cluster Cooperative Project" (current "Cooperated Cluster Project with Concerned Ministries") was added to accelerate the formation of a knowledge cluster.

As a result, in FY 2005, prototypes were created within a week, benefitting from the prompt prototype design that resulted from the use of the "Manufacturing Platform," while conventional redesign methods took a month and a half to do the same. Furthermore, in FY 2006, the "Manufacturing Platform" put out two prototypes, which was enough to validate its functionality.

*Usability: A product design concept that considers users when designing products and that conveys the "ease with which functions are understood" and "ease of use" of a device or system to users. This is also called "human-centered design."



R&D and Knowledge Cluster Creation in the Sapporo Region

Establishing the "Sapporo IT Front" to carry on project achievements.

In order to create the "Manufacturing IT Workshop" intended by this project, a platform was developed to facilitate integrated and interlinked prototype fabrication processes ranging from requirement definition and concept design to prototype fabrication and validation. Prototypes were also developed; systems were established within joint research companies to carry on the results.

"Sapporo IT Front" was established in March 2007 as a specified NPO to carry on the achievements from the five-year project and continue them as a business. The "Sapporo IT Front" is designed to promote the achievements to utilize commercially and also maintain and develop cooperation among industry, academia, and government.

After the conclusion of the five-year project, companies in the region, led by the "Sapporo IT Front", are expected to realize the "Manufacturing IT Workshop" by utilizing the "Manufacturing Platform" and manufacture products developed from prototypes, thereby facilitating the formation of new industries and regional clusters in Hokkaido.

Project Director (FY 2002 to 2006)

Koichi Kito

Deputy director general of the Construction Department of the Hokkaido Government, deputy mayor of Iwamizawa City, executive director of the Office for Community Development Promotion, Construction Department of the Hokkaido Government, general manager of the Hokkaido Northern Regional Building Institute, and adviser for TECHNO LABO Co., Ltd. before serving as project director.

Cluster Headquarters

○President……Tetsuo Shimokawa (Professor, Graduate School of Commerce, Otaru University of Commerce)

○Project Directo……Koichi Kito

○Chief Scientist……Tsuyoshi Yamamoto (Professor, Graduate School of Information Science and Technology; Director, Information Initiative Center, Hokkaido University)

○Science and Technology Coordinators…Wataru Ozawa, Yasushi Ooi, Konomi Tomisawa

Core Organization

Northern Advancement Center for Science and Technology (NOASTEC Foundation)

Participating Research Organizations (Bold: Core Research Organization)

Industry…B.U.G., Inc., Micronet Co., Ltd., Softfront, Mechanical Engineering Research Laboratory, Hitachi Ltd., Atmark Techno Inc., C's Lab Co., Ltd., INFORNET CO., LTD., Chaos, DENSEI INC., Arm Design, Co., Ltd., CLEAT Inc., NEC Software Hokkaido Ltd., GeneticLab Co., Ltd., Data Craft Co., Ltd., Connect Technologies Corporation, intelligent Link Inc., and others

Academia…**Hokkaido University,** The University of Tokyo, Otaru University of Commerce, Kanazawa University, University of Yamanashi, Future University-Hakodate, Sapporo City University, Hokkaido Tokai University, Hokkaido Institute of Technology, Showa University, Hokkai-Gakuen University, and others

Government…Hokkaido Industrial Research Institute, National Institute of Multimedia Education, National Institute of Advanced Industrial Science and Technology

Main Results

1. "Manufacturing Platform"

The Sapporo IT Carrozzeria project aimed to create a group of companies that can provide comprehensive solutions including product planning, software development, and prototype fabrication by transforming this region's IT products from "invisible, intangible software" to "visible, tangible prototypes."

To achieve the goal, embedded software, a strength of the region, was combined with "usability" and "design" to create a joint venture system utilizing the "Manufacturing Platform," where unified process management of various development environments is possible in the development of IT devices.

2. Information appliances-model products (SIP presence server & presence box)

An SIP presence server and a presence box incorporated in a system as a client were prototyped. Both have unique features, such as a presence (status monitoring) function that transmits real-time status information of devices on the Internet and Instant Messaging, a real-time exchange of short texts. In this R&D project, software (a shared hardware and software module to control information appliances) was developed using embedded firmware of joint research corporations together with SIP for validation of rapid prototyping of next-generation embedded systems. The presence box was prototyped utilizing that module. The results of this project are expected to shorten the development time for embedded systems in the future.

*SIP (Session Initiation Protocol: A type of protocol used to exchange messages on the Internet)

3. MRR (Multi-Resolution Representation) Mesher

The MRR Mesher is a system that can flexibly generate mesh data from various forms of raw data such as CAD, X-ray CT scans, and CG data. This collection of mesh data is suitable for FEM analysis, which predicts overall behavior by dividing an object of complicated shape and properties into simple parts. The adoption of the unique MRR in this research enabled the high-speed generation of mesh data with drastically small numbers of elements while maintaining the form accuracy and element quality. This device, applicable both to triangle and tetrahedral mesh, was planned for commercial production by a leading manufacturer in October 2006, which is expected to enhance the efficiency of the combination of 3-D CAD with CAE analysis for improved design quality in the manufacturing industry as a whole.

4. Refined "My Logger"

A joint workshop for product design was held with design groups overseas, and a mock-up of a "My Logger (USB digital phone recording system)" IT device was created through a redesign process. The resulting prototype is expected to be eventually adopted as a product for sale in FY 2007 after production of several mock-ups. The objective of this project was to provide young designers in the region with the opportunity to jointly work with a leading European design institution and the experience of redesigning products to develop their skills as designers and train them to create market-oriented product designs. The emphasis on fostering designers in this region, coupled with redesigning of nationwide products, was expected to stimulate the design business in Hokkaido.