KIT Hackathon that Facilitate Innovation at Regional Area

Minoru Nakazawa

Department of Information and Computer Science, Kanazawa Institute of Technology

Takayuki Fukuda , Noriko Nishikawa

Office for Industry-University Collaboration at Kanazawa Institue of of Technology

ABSTRACT

In general, Hackathon is a programming-based contest that combines hacking and marathon. It rapidly became popular as a method of software technology development and technological innovation. Since 2014, KIT Hackathon was established by faculty and staff whose research field is IT (Information Technology) · RT (Robot Technology), including Minoru Nakazawa (one of author) of Kanazawa Institute of Technology Department of Information and Computer Science. After that, we regularly hold it once per half year. Through KIT Hackathon as a place for educational research through cooperation between industry and academia, we intend to create products that can be implemented on a daily basis and cultivate innovators who will be responsible for the future.

KEYWORDS

Collaboration between industry and academia, Hackathon, Facilitate Innovation, Regional collaboration

INTRODUCTION

In recent year, Hackathon intended for one of regional creative method has been widely recognized and carried out not only in domestic but also international level.

However, in mostly events, there are quite communities centered on computer programmers who are called Hacker. As a result, the current situation is that the shortage of human resources to form a framework necessary for regional creative and the participation of companies providing information that they are not perceived as expected by the organizer's group.

At Kanazawa Institute of Technology, since September 2014, students, teachers, staff members have been working together on KIT Hackathon. To hold regular events, this event is held at half-yearly pace. With holding in September 2017, we held a total of seven times.

There are some of remarkable feature at KIT Hackathon.
1. The original idea is not from a faculty member nor a staff member but a proposal from a student.
2. About Vol.1 and Vol.2 almost no formal attention or support is given from our university(KIT). We focused on accumulation achievement fact.
3. The composition of participants. 60% are students, 30% are working people (including local residents), and 10% are faculty members. The number of people is 40 to 60, of course, there is a certain increase or decrease each time.
4. It is characterized by abundant supply of products and information from companies. Many companies provide main products and information. From the perspective of the company, KIT Hackathon is a site for the trial environment of new products.

5. The support system after the end of KIT Hackathon is distinctive aspect. Many existing Hackathon creates prototypes Instantaneously and leaves nothing after putting it in the contest. However, in the case of KIT Hackathon, there are cases where region creation has been realized.

Currently, KIT Hackathon is being recognized not only by our university but also by neighboring municipalities(Kanazawa, Nonoichi, Hakusan, Kaga, e.t.c) , universities, companies, residents, and is requested to hold more events and is requested to dispatch participants to other Hackathon .

In this paper, we explain these things in concrete terms and explain the effect KIT Hackathon has on education for students, using motivation, skill acquisition and achievement. Furthermore, we explain what kind of expectation among local residents in region creation.

KIT HACKATHON STARTED BY ONE STUDENT'S REQUEST

It was in the summer of 2014 that KIT Hackathon was started first time. A student who was participating in the ideathon (Idea + Marathon) sponsored by the municipality was triggered by the request that "Can we do Hackathon at KIT?". At that time still mature Hackathon was not held in Ishikawa Prefecture. So, we had collected Hackathon's information from Tokyo and had started it in consideration of the characteristics and regional of KIT. Currently, KIT Hackathon carry out seven times. The theme has been changed every time. However, it is always based on "region-oriented" and we feel that the contents are upgraded every time.

Not only in Ishikawa Prefecture, there are cities that are going to disappear in the current state in Japan as it is maintained. Although these regional cities do not innovate, Ishikawa Prefecture will lead to the decline of the whole country in Japan. Just as there are things that can only be done in Tokyo, there is something that can be done because it is a regional area. In addition, there is Hackathon which is possible because of our university which has a good relationship with this area. Along with changes in the environment surrounding local cities, new themes and expansions are anticipated in KIT Hackathon, however, "region-oriented" and "industry-academia collaboration" will continue to be the center of the future.

Figure 1. State of KIT Hackathon

HISTORY OF KIT HACKATHON

The 1st theme: Innovative creation in local cities (rescue the marginal cities that disappear)
Place: KIT, Entrepreneurs Lab
Date: Sep 20-22, 2014
 Abstract: Thirty students from the Department of Robotics, Department of Information and Computer Science and 12 persons from seven companies participated. NEXT Co., Ltd., which manages the largest real estate property introduction site in Japan, Fuji Software Co., Ltd. providing interactive robots (PALRO), It was PFU Co., Ltd., a local company, IO Data Co., Ltd., Change vision Co., Ltd. These companies provided variety products and API (Application Programming Interface). Invited judge members from Nippon Venture Capital Co., Ltd., and received evaluation and advice. A team that developed a system of tourist information corresponding to globalization was chosen as the best award.

The 2nd theme: Shinkansen has just opened, and then…
Place: KIT, Entrepreneurs Lab
Date: Mar 19-22, 2015
Abstract: We invited Japan Microsoft Co., Ltd. to an information providing company and bring up themes related to IoT. Mr. Miyata, president of SEND Co.,Ltd. explained about the influence of design on society. Mr. Fukushima, exective director of Code for Kanazawa, explained about the attractiveness of social innovation. KIT provided information on the artificial intelligence technology "deep learning" used in the wheelchair robot control system. With the theme of sightseeing in Kanazawa city, we developed a solution linking space information with a bus stop and a solution to promote the use of bicycles installed in the city. As the winner of the award, "Casadas" was chosen, where various productions will take place in the rain. It was equipped with sensors and LEDs on umbrellas developed by high school students and KIT students.

The 3rd theme: Society changes with near future, The Social Security and Tax Number System and IoT.
Place: KIT, Entrepreneurs Lab
Date: Sep 18-20, 2015
Abstract: We held Hackathon as a main information provider of GMO Global Sign Co., Ltd. At first day, Mr. Nakajima, Chief Cabinet Counselor Assistant, explained about law of social security and Tax Number System. Mr. Umeya, Nomura Research Institute Co., Ltd, explained about system of social security and tax number system. After that, description of activities by companies from the participating companies and services, creation of ideas from students was carried out. Students are divided into nine teams, worked on the programming based on their ideas created with support from engineers, participating companies. And, students made each presentation on the final day. As the winner of the award, Kanazawa tourist activation using a bike for the team was selected. A system of rental bicycle which can lock and unlock using personal number card was proposed. At the same time, it is a system that analyzes sightseeing big data using acquisition of position information of bicycle.

The 4th theme: Let's create an elementary school of the near future – Technology, Education, Design and Regional –
Place: KIT, Entrepreneurs Lab, Kanazawa Municipal Shijima Elementary School
Date: Mar 18-20, 2016
Abstract: Students, local residents, elementary school officials and elementary school students also participate. There was a keynote lecture on the problem consciousness of the school and the area. Participants of Hackathon grasp the condition of the school by

observing how the children are taking classes. After that, about 50 students and corporate mentors work on Hackathon and make presentations on the final day. Primary school principals, community residents and elementary school students made a judgment, and the web application on the theme of local disaster prevention and crime prevention won the best prize.

The 5th theme: Create next-generation satoyama cities where children grow abundantly
Place: Hakusan mountain campus
Date: Aug 8-9, Sep 15-17, 2016
Abstract: More than 100 participants, including KIT students, students of Kinjo University, local IT companies, OB / OG, etc., gathered together. Invited talk by Vice President Suzuki of Borderless Japan Co., Ltd. Professor Nagao of Department of Applied Biology, Professor Nakazawa of Department of Information and Computer Science and Professor Shimokawa of Department of Architectural Design, panel discussion was held. At the final day's presentation, 200 people including participants from companies as well as local residents gathered and creative presentations of each team were held. After each team's presentation, Mr. Saito, CEO of Rhizomatics, gave a lecture on the importance of "Anti-Disciplinery". Mr. Kitayama, CEO of Kitayama Creation Research Institute, got a general review on this Hackathon. The best award of team created an Android application that can search for treasure while climbing mountains by using the GPS function.

The 6th theme: Olympics, Paralympic Games and Regional Creation ~ Let's join the Tokyo Olympic and Paralympics Games from Kanazawa!
Place: KIT, Entrepreneurs Lab
Date: Mar 18-20, 2017
Abstract: First of all, there was a keynote speech by Mr. Katsumata of the Sports Agency of the Ministry of Education, Culture, Sports, Science and Technology. After that, there was an invited lecture by Mr. Fukushima of Code for Kanazawa, Mr. Nishiwaki of Japan Microsoft, and Mr. Maruyama of Maruyama office representative. During Hackathon's time, Child Hackathon was held for children at the same time to communicate the enjoyment of manufacturing such as combining blocks and various sensors. As a result of the presentation with all seven teams, the web service that connects sightseeing spots and shops in Kanazawa city based on athlete's hobby taste data, and enjoyed sightseeing in Kanazawa at an athletic line won the Best Award.

The 7th theme: Children's Innovation "Kodomonovation"
Place: Shiramine primary school site
Date: Sep 15-17, 2017
Abstract: More than 50 participants, including creators and designers from Tokyo, tackled Hackathon with Edutech toy as the key word. On the first day, we conducted orientation and discussion. On the second day, NTT DoCoMo held a seminar on development by Arduino using LPWA(Light Power Wireless Access). Open seminar for those elderly who live in the region and participating as members. We held an exchange meeting with elderly people living in the area and students and set up opportunities to listen to past experiences. Students had new ideas from this exchange and a new awareness of "Edutech Toys $\neq$ Children". At the presentation on the final day, a story presentation was made, and as a result of the comprehensive evaluation, the best award was awarded to a team that developed a communication tool based on "mischief" as a theme.
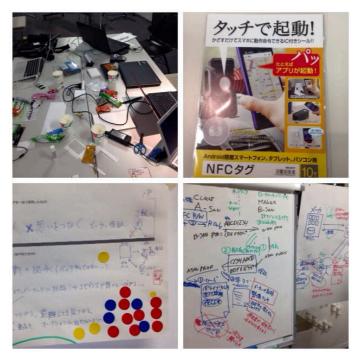
Figure 2. Idea Creation and Try the Hacking

ONE OF ROLE AS SKILL-UP PROJECT

First of all, this event is positioned as a "skill-up project" to promote the long-term projects students are working on individually, such as the KIT Honors program and the university COC project of the Ministry of Education, Culture, Sports, Science and Technology. Students can make use of the advantage that Hackathon is a short-term centralized development and can use the new knowledge and awareness gained there by feeding back to the long-term project. For students, it is also used as a place to test whether what we have learned so far is practical in the real world.

As for the number of people participating in Hackathon, the students of the Department of Information and Computer Science are the most numerous. Despite the small number of students, however, students of the Department of Architecture, Department of Mechanical Engineering and Department of Electrical Engineering are also working ambitiously. Students of the Department of Information and Computer Science can make works by programming but don't know architectural design in detail. The reverse is also true. Through Hackathon, we also discovered the possibility that students' knowledge will expand by meeting knowledge that they had not known until then. Also, by adding various members like company engineers and designers, the possibility of Hackathon can be tremendously large. And also for the company side, Hackathon was an opportunity to introduce company products. In addition, it was often used as a new means of human resources discovery.

INSUDTRY-ACADEMIA COLLABORATION AS CAREER EDUCATION HACKTHON

In general, while Hackathon itself is said to be held once a year, KIT Hackathon has held it once a half-year cycle. As preparation, we believe that it is held in a considerably short cycle because preparations are necessary for theme setting, advertisement of participating companies, calling to students, holding it. Once a year, the number of students who can

participate during the school term is limited, but every half year, we can make many Hackathon experiences while overlapping participants. As a result, it is possible to improve the overall level by making Hackathon a experienced person and a beginner in a balanced team. Recently, companies that anticipate the environment of our university and the quality of students are increasing requests for offering "hack products" and requests for collaborative research.

CREATE IMPLEMENTATION PRODUCTS

For example, if the software created by KIT Hackathon is open source, there are cases where you can use generically in regional cities throughout the country just by changing the data. In some case, students outside Ishikawa Prefecture have applied the software created by KIT Hackathon, replacing their internal data with their own regional area.

Recent KIT Hackathon has announced a system to operate a coffee machine using a home audio assistant device. As a result, there were contacts from overseas headquarters, domestic sales representatives came to visit directly. We plan to invite engineers from Europe to KIT Hackathon in the future.

At the 4th KIT Hackathon who was directly connected with the local residents for the first time, we did Hackathon with elementary school students. At that time, as well as pleasure for receiving evaluation from the residents directly, We were stimulated also by the flexible idea unique to elementary school students. Products that can already be implemented in real society are created through this Hackathon, and one of the authors feels happy as a mentor.

RESULT OF EVALUATION QUESTIONNARIRE

Next is a questionnaire result that we asked participants voluntarily after the second KIT Hackathon. We got responses from 22 participants.
The result of the first question asked the motivation for participation in Hackathon(Figure 3). At this time, it was the second time that the participants were most interested in Hackathon itself.
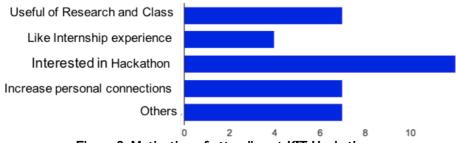

Figure 3. Motivation of attending at KIT Hackathon

Next, Figure 4 shows the result of question "Have you experienced fun and importance in Hackathon?". " Very experienced " and "Experienced" together, we got a rating of over 90%.
Finally, it is a survey on pre-learning on Hackathon and shows the results showing that it is very important. (Figure 5)
As a result, students tried at the event called KIT Hackathon as a confirmation of the skills and knowledge studied at the university. In addition, We understood the importance of

studying consciously about contents that students felt missing themselves in KIT Hackathon from the usual day.
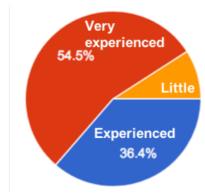

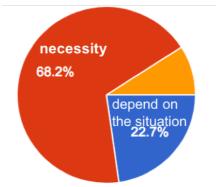Figure 4. Have you experienced fun and importance in Hackathon?

Figure 5. Pre-learning on KIT Hackathon

CONCLUSION: RESOLVING REGIONAL ISSUES WITH IT

For students, local people, companies, faculty and staff including us, We would like to make it possible for everyone involved in KIT Hackathon to need to think "fun".
Actually, recently we had the opportunity to join Hackathon as a player and we also understood the feelings of the players side. I would like to take advantage of that experience and hold a Hackathon that participants can enjoy more. Also, what is common to hit products is "humor", and we are expecting the birth of a product that makes KIT Hackathon exciting users. We hope that students will be able to take full advantage of opportunities to interact with the world's most advanced technologies, opportunities to interact with technicians active in the front lines, and to know the pleasure of "making things" . The base of KIT Hackathon is always "region-oriented", and by adhering tightly to the feelings of people in the community, we know what is necessary in that area. Therefore, students want to learn IT skills, acquire communication skills, and develop Hackathon more familiar to regional people.

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BIOGRAPHICAL INFORMATION

Minoru Nakazawa is a Professor in Department of Information and Computer Science in College of Engineering at Kanazawa Institute of Technology. He graduated from KIT in 1991, received a Master of Engineer in 1993 and Ph.D. in 1999 from KIT. He had engaged at Fujitsu Laboratory from 1993 to 1996 as a network & computer researcher. He has been engaging at KIT since 1996. His Primary research focus is on the technology innovation and integration to advance science of robotics and networking.

Takayuki Fukuda, Associate Director of Office for Industry-University Collaboration at Kanazawa Institue of of Technology, Kanazawa, Japan. He supports the innovation projects by industry-university collaboration. He is also an assistant leader of the "Watson Project" to introduce AI in campus.

Noriko Nishikawa is a chief of Office of Office for Industry-University Collaboration at the Kanazawa Institute of Technology. She supports for KIT students and teachers and social companies to collaborate each other to create the innovation.

Corresponding author

Dr. Minoru Nakazawa
Kanazawa Institute of Technology
Ohgigaoka 7-1
Nonoichi, Ishikawa, Japan 921-8501
+81-76-248-1100
minoru.nakazawa.jp@ieee.org