

New Field Product Development Management through the Collaboration of a Traditional Crafts Company and an IT Apparatus Company

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Abstract--Ishikawa Prefecture has top-level traditional-handicrafts techniques in Japan and holds a large production value of traditional crafts.

However, according to the Department of Commerce and Industry in the Ishikawa Prefectural Government, its production dropped to a one-third compared with that in its best period (1990). Similarly, the output of traditional industries has been greatly reduced in Japan as a whole. The external factors of this tendency are the change in lifestyle and the increase in cheap imports, and the internal factors might be the delay in product development adapted to the needs, and the delay of new distribution channels development. In order to improve this decline, some new field products have been developed by the collaboration of IT equipment companies and traditional crafts companies. Among these, the USB memory with the box of traditional porcelain, the mouse painted with lacquer, and the iPhone cover decorated with gold lacquer are receiving good reactions from clients.

This paper will propose a product development management in a new field, presenting a case study of the above-mentioned hot-selling products.

I. INTRODUCTION

A. The social background and problem of traditional crafts

According to the feature of the Ishikawa economy established by the Kanazawa branch of the bank of Japan [1], the number of winners among the Ishikawa Prefecture of Japan Art Exhibition and Japanese traditional crafts exhibition winner is the highest in Japan. The holders of an important intangible cultural property in the field of traditional crafts are ten people in Ishikawa Prefecture. Because they are the top in Japan, it is famous as "art, an industrial arts kingdom". According to the Ishikawa business and industry Labor Relations Division, the amount of money produced of the traditional industrial art object industry decreased by 26% in 2012 when compared with 1990 at the time of the peak. When the number of workers in 2012 is compared with that in 1992, there is a serious decline, decreasing to only 39% (Fig1).

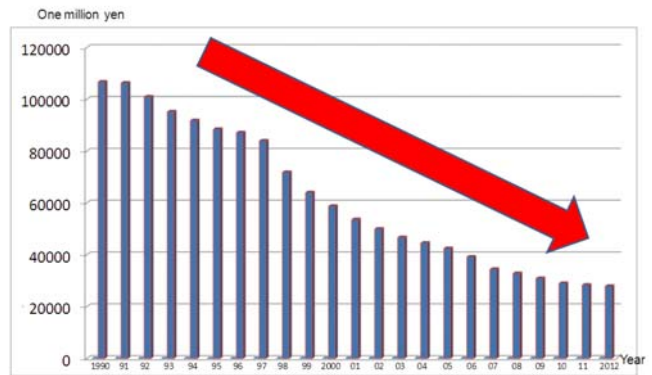
The external factors of the decrease are the change of the lifestyle, the cheap product by the mass production method, a strong overseas brand and cheap production. The internal factor is a delay of new market reclamation and the product development meeting corresponding to the needs (Fig2).

The innovative activity is carried out in various parts of Japan[4,5,6,7,8,9,10].

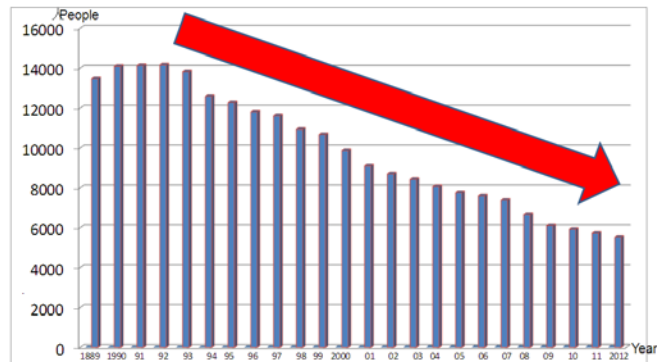
The innovative activity which requires a new market is

making a successful example from the traditional crafts industry of Ishikawa Prefecture in a drastic situation.

Trends in the number of workers in traditional crafts industry of Ishikawa Prefecture (36 items)



Production value is reduced to 26% of (1990) peak
Trends in the number of workers in traditional crafts industry of Ishikawa Prefecture (36 items)



The number of workers decreased to 39% of (1992) peak

Fig1 Decline of the traditional crafts of Ishikawa Prefecture

The project entitled "Ishikawa traditional crafts innovator training unit (following and traditional crafts innovator lecture)" of the Japan Advanced Institute of Science and Technology, in the Hokuriku region (JAIST), is supporting the innovative activity in this field.

This project was started in 2007.

The case example of product development management of this paper is also one important aspect.

Social background and problem of traditional crafts

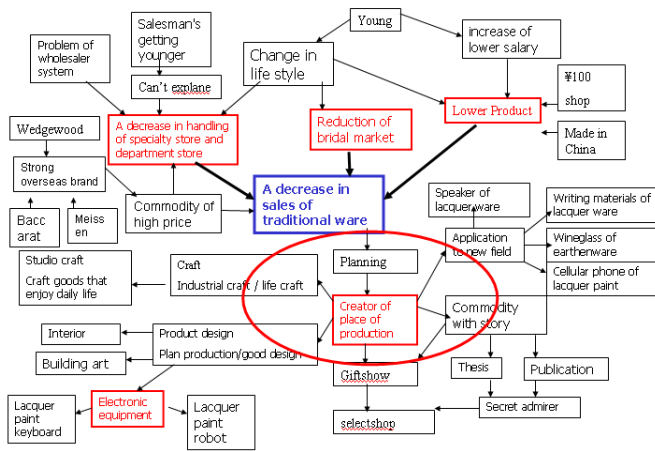


Fig 2 Social background and problem of traditional crafts

B. Hypothesis and purpose of the research

This research evaluates the following hypotheses regarding product development management of a traditional crafts company and IT apparatus company by using a questionnaire to the participants in a traditional crafts innovator lecture.

<Hypothesis and contents of evaluation>

- The goods developed through collaboration between a traditional crafts company and IT apparatus company have high evaluation in a market.
- Management of new product development between a traditional crafts company and a cross-industrial company is effective.
- The traditional crafts innovator lecture is effective in new product development management.

The above issue is not only a success example of product development management. It also presents effective product development management of cooperation across occupational lines as the whole traditional crafts industry. We want to implement an effective product development management by combining the management of a traditional crafts company and a cross-industrial company through the way of doing business Ishikawa Prefecture.

Through this research, we want to perform element extraction of the effective product development management in order to deal with the decline of the traditional crafts industry and to expect a realistic economic effect.

II. PROJECT

ISHIKAWA TRADITIONAL CRAFTS INNOVATOR TRAINING UNIT (MAY, 2007 ~) [3]

A. Personnel training target

This project aims at an innovator's creation in order to carry out regional vitalization in the traditional crafts industry.

The skill taught through this project is as follows.

- The comprehensive management view of grasping each technology, the strong points and subject in consideration of the whole traditional crafts
- The management viewpoint which discerns the technical originality and the strong points which it has, and it connects to actual business, such as development of a new product and service based on the needs of a consumer and a user
- Management capability to advance positive cooperation with the same type of industry or a different type of industry, and to tow the industry

B. Personnel training plan

Hereinafter, the cycle which teaches three courses in one year is repeated.

(1) Traditional crafts MOT course (three months)

The talented people who lead reproduction and promotion of traditional crafts industry are trained. Knowledge management required for problem solving of development and commercialization of a traditional crafts article, technical management, marketing, a branding strategy, a tip case study, state-of-the-art technology, etc. are studied.

(2) Traditional crafts area MOT course (three months)

The technology to own, the developed new technology, and the talented people who can do the management in order to harness the new product are trained. A participant argues about the expert, subject of a producing district, changing needs, and the measures of traditional crafts industry with a buyer. A participant argues for the advanced example in a production place.

Product planning and a practice document are drawn up through a product planning exercise.

(3) Product development practice project (six months)

The project leader equipped with management capability for a product development project is trained. A participant furthers planned product development with a director's advice. The effective plan to connect the planned goods to sale is drawn up. The display technique in a show etc. is learned and the rehearsal of the exhibition is performed. Finally each specialist participates in a show and makes explanation of goods and a marketing effort to a buyer.

III. PRODUCT DEVELOPMENT

A. Kutani porcelain USB Memory

Description of item: The USB memory is covered with the body of Kutani porcelain.

Development term: 2008/3~2008/10

Price: ¥10,500 (tax included)

Feature: The skillful painting drawn with the Japanese-style paints of Kutani porcelain, and high-class textures

Development Management:

- Planning

In positioning mapping centering on functionality and sensitivity, a plan for sensitivity to throw high goods into a domain vacant in big-ticket area was formed.

- Design

Specifications and a blueprint were created like the design process of an industrial commodity.

USB Memory Positioning map

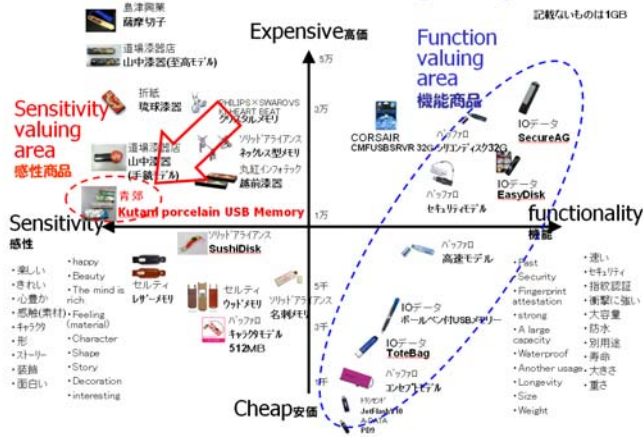


Fig 3 Kutani porcelain USB Memory positioning map

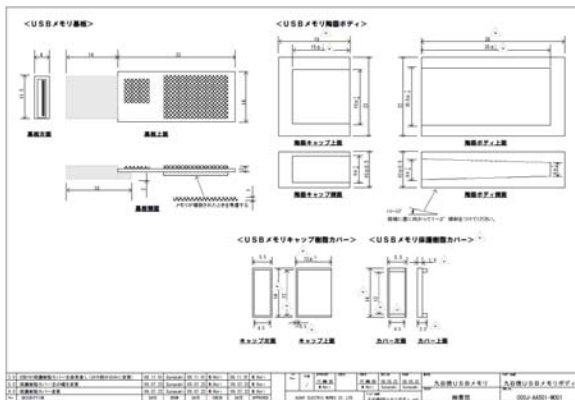


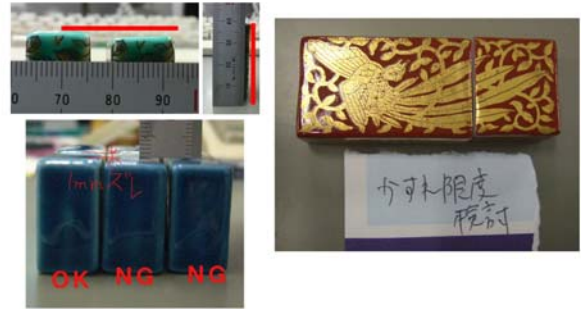
Fig 4 Kutani porcelain USB Memory Blueprint

- Problem-solving

There is no perfect accuracy for the body of Kutani porcelain. Although ± 0.2 mm is required with an industrial commodity, only an accuracy of ± 2 or 3 mm can be achieved. It was judged that it would be difficult to make the Kutani porcelain, a traditional crafts with its history of 350 years considering the accuracy of an industrial commodity. That's how the attachment and the production method were devised and joint technology was established.

Accuracy of the porcelain body is not good

Tolerance in Electric is ± 0.2 mm.
But tolerance in porcekein is ± 2 mm.



Electronic equipment to ensure accuracy



Joining technology was established by the manufacturing method and fixed parts

Fig 5 Problem of accuracy and Joining technology

B. Japanese lacquerware mouse

Description of item: The mouse to which a craftsman applies Japanese lacquer to create each unique pattern.

Development term: 2009/12~2010/8

Price: ¥5,250 (tax included)

Feature: A pattern, tactile feeling and gloss of Japanese lacquer which differs one item from the next.

Development Management:

- Planning

In positioning mapping centering on functionality and sensitivity, a plan to avoid the big-ticket area which competes and throw goods into a vacant small market area was formed.



Fig 6 Lacquerware mouse

Lacquer ware mouse Positioning map

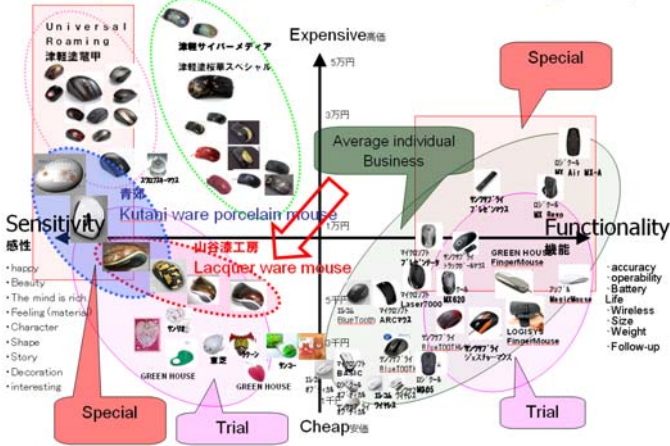


Fig7 Lacquerware mouse positioning map

- Design

There were competitive products costing 30,000 yen to which Japanese lacquer was applied to some parts with hand touches. Spray coating was adopted in order to hold down the product price.

The processing cost was reduced by adopting various design and patterns through this spray coating.

- Problem-solving

There is a problem which will be occurring if a cover is painted with a Japanese lacquer.

The solution was designed to remove this problem with structure which doesn't transform a cover easily.

C. MAKIE embossed iPhone Cover

Description of item: The iPhone cover made of lacquer work with three-dimensional and powerful look & feel

Development term: 2010/1~2010/11

Price: ¥3,990 (tax included)

Feature: High peak lacquer work with three-dimensional effect. A decoration made by craftsman.

Development Management:

- Planning

Many goods were set from commodity domain to premium domain. MAKIE Embossed made this premium domain affordable. In order to hold down a price so that the product can be easily purchased in a network and to produce many numbers, only MAKIE was made into the feature without using Japanese lacquer. However, the "high peak lacquer work" which only a small number of craftsmen can process was adopted.

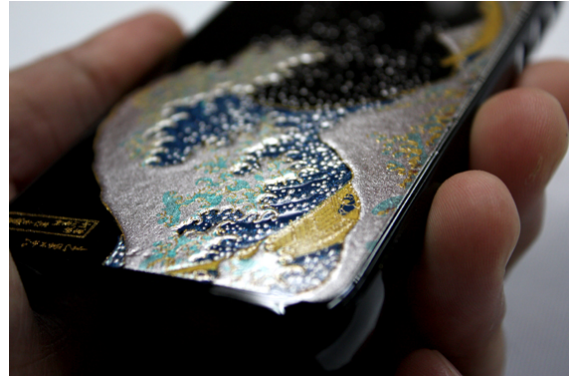


Fig8 MAKIE Embossed iPhone Cover

iPhone Cover Positioning map

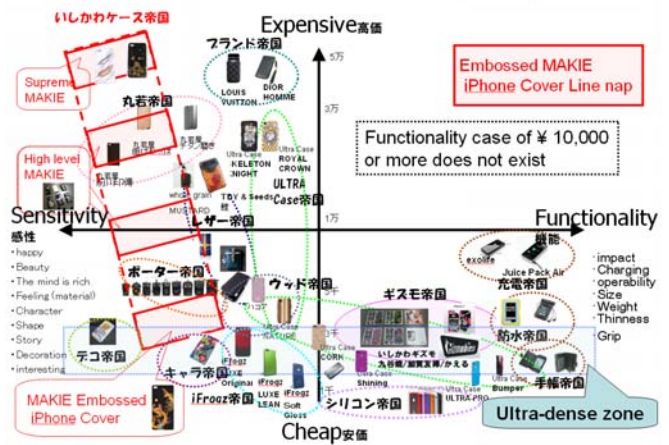


Fig9 MAKIE Embossed iPhone Cover positioning map

- Design

Using the questionnaire of a sales place in Singapore, the craftsman designed a pattern with meanings, such as feng shui. When making the pattern which he designed, because of a craftsman's motivation rising.

As a result, quality does not worsen.

- Problem-solving

When strong polycarbonate is adopted, there is a problem concerning which processing of lacquer work separates easily. It became usable by finding a paint which does not separate easily. As a result, it succeeded in the product development which combines both functionality and sensitivity.

- Sales

The sales starting place had the very high diffusion rate of iPhones, and Singapore, which is a center of succeeded Asian fashion. A sales strategy is extending sale in Asia which marketed on trial in Singapore and includes Japan.

D. Management's differences from a traditional-handicrafts company and an IT apparatus company [2]

- The difference in accuracy of the size of the Kutani porcelain is about 10 times.

- Quality level is low in comparison with industrial products
- Production capacity is low. For example, USB memory of industrial products is 10 000 or more / month. Kutani is 500 pcs / month.
- Ratio of loss is large.
- Traditional-handicrafts companies do not usually create a blueprint.
- Production period is long.

IV. BUSINESS ACHIEVEMENT

A. Business outcomes

The Kutani porcelain USB memory followed the size of the market of a USB memory, and sales went beyond expectation due to the demand of individual presents, overseas souvenirs, novelties, etc., and there was a solid effect of expansion of a new field market. Moreover, although technology and management are natural, the love of traditional crafts, the knowledge supply of a university and support for Ishikawa Prefecture are raised to the commercialized element. A Japanese lacquer mouse is purchased in many cases for oneself. In welcome of a present, since a partner's liking is important, it is difficult. Since the person who likes traditional crafts becomes a target, the market is limited. However, since there is a certain amount of demand, the volume of sales is stable. MAKIE embossed cover is a relatively large market as traditional crafts, and one can obtain quantity and an expected amount of money. Since management of a cost cut, stock, or quality control differs

from the traditional crafts, it requires much communication. Since the beauty of traditional crafts is also easily communicated to overseas country out of Japan, overseas evaluation is also important and this product is sold in 11 countries through overseas web, a shop, a museum, etc.

B. Achievement Interviews of traditional crafts manufacturer

1. Manufacture of the body of a Kutani porcelain USB memory

(Evaluation interview of Keita Kitano of Seikou.Co.Ltd)

Since Seiko wanted to make an industrial commodity, it became an experience good as a new trial.

Although it was difficult at the beginning, since it was Kutani porcelain with on unpredictability in a world, we think that it became popular. Since it sold for 10,000 yen a USB memory of 1,000 yen was ornamented with Kutani porcelain, Kutani porcelain gave 10 times as many added value. But appreciating is that dealings of the conventional goods increased by the advertising effectiveness derived from there rather than the sales total of the Kutani porcelain USB memory.

2. Manufacture of a Japanese lacquer mouse and MAKIE Embossed cover

(The evaluation interview of Yoshisuke Okada of Okada Lacquerware)

This is the most motivating and exciting product development experience.

A Japanese lacquer mouse has both handmade and high-class feeling. We apply Japanese lacquer to a cover and appreciate the management method to realize structure which can be attached later in a simple way. High peak lacquer work covers are goods to which the lacquer work using the screen technology, a strong area of Yamanaka lacquerware, is usefully applied, and we hope that this technology will spread to a market and goods. Since the price had a high-class feeling although it was cheap, we thought that there was much volume of sales. The craftsman is working better with higher motivation. The award of the contest brought a joy to both craftsmen and us. Polycarbonate had issues such as garbage with peeling or static electricity.

However, since the problem was solved, it became my confidence. Both goods can expect a certain number in sales and profits.

C. Media Achievement

It was published in a total of 38 newspapers and magazines, and also was awarded seven prizes. The Kutani porcelain USB memory was greatly appreciated by the local newspaper Hokkoku Shimbun, and it was taken up to the top page of Yahoo news, and there was a big news hook. Furthermore, the Kutani porcelain USB memory was highly evaluated as chose as the second prize of a LUXURY JAPAN section from a total of 685 items in "souvenir contest 2010 of attractive Japan" conducted by the Japan Tourism Agency . The MAKIE Embossed iPhone cover was chosen as the

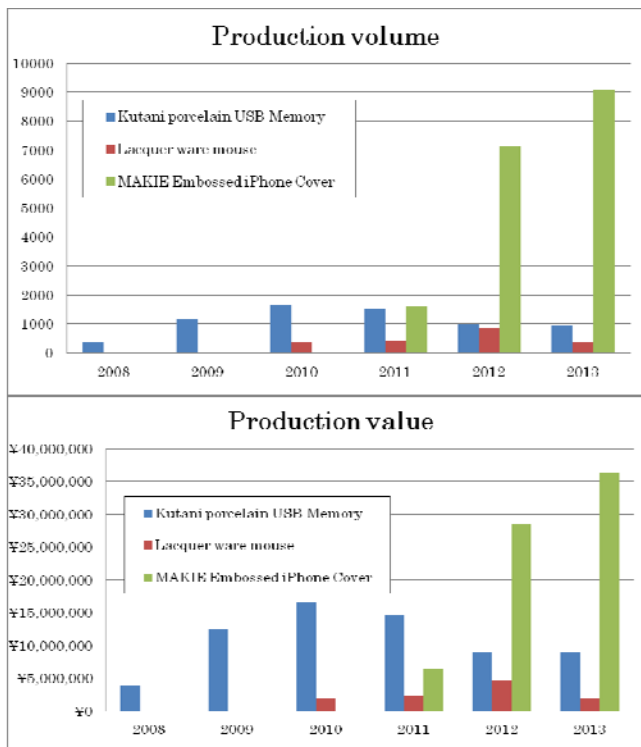


Fig10 Production volume & value

second prize and the U.S. prize in a COOLJAPAN section in the "souvenir contest 2013 of attractive Japan" by the Japan Tourism Agency. Furthermore, it was awarded as the premium Ishikawa brand.

The strategy goods in the COOL JAPAN PR enterprise of the Ministry of Economy, Trade and Industry were authorized.

V. ANALYSIS

The questionnaire was requested to be answered by 30 participants in traditional crafts innovator lecture, and answers from 28 were summarized as follows. Q1-Q10 is a marking type of question. Q11-Q15 is a description type of question.

- Q1: Evaluation of Kutani porcelain USB memory**
- Q2: Evaluation of Japanese lacquerware mouse**
- Q3: Evaluation of MAKIE Embossed iPhone cover**

Results with the highest evaluation of a Kutani porcelain USB memory were obtained.

On the other hand, it turned out that evaluation is not proportional to business outcomes and there is a gap between market evaluation and this participant's evaluation. I understood that this gap became the big problem when I developed a collaboration product.

The participants who attached low evaluation are the craftsmen. The particularly low evaluation is the embossed MAKIE iPhone cover. Because there was the fixation concept that a tree should be used for as for the material of the lacquerware of the traditional crafts, there was comment that an evaluation was low.

When a craftsman keeping the fixed concept of the traditional crafts develops a new product, the management includes a big problem.

Q4: Influence of the traditional crafts industry through collaboration product of traditional crafts and the IT apparatus

By having obtained high evaluation, it is judged that it had influence good for traditional-handicrafts industry. It was evaluated by comment what was taken a lot up by the media by being a new trial.

Because there is a difference more than 10 points with other people with a craftsman, there is difference in an apparent thought.

Q5: Validity of new product development of cross-industrial collaboration

Since it is a numerical value higher than Q4, the participant thinks that not only IT apparatus but cross-industrial collaboration is more effective. However, if it is a cross-industrial company of the field near traditional handicrafts, understanding of the validity of the collaboration of IT apparatus differs. Since there are many replies with "new" IT apparatus in Q11, it is thought that it succeeded

since it was the collaboration of the far field. I want to investigate whether the collaboration in the far-off field is effective in future.

Because there is a difference more than 10 points with other people with a craftsman like Q4, there is difference in an apparent thought.

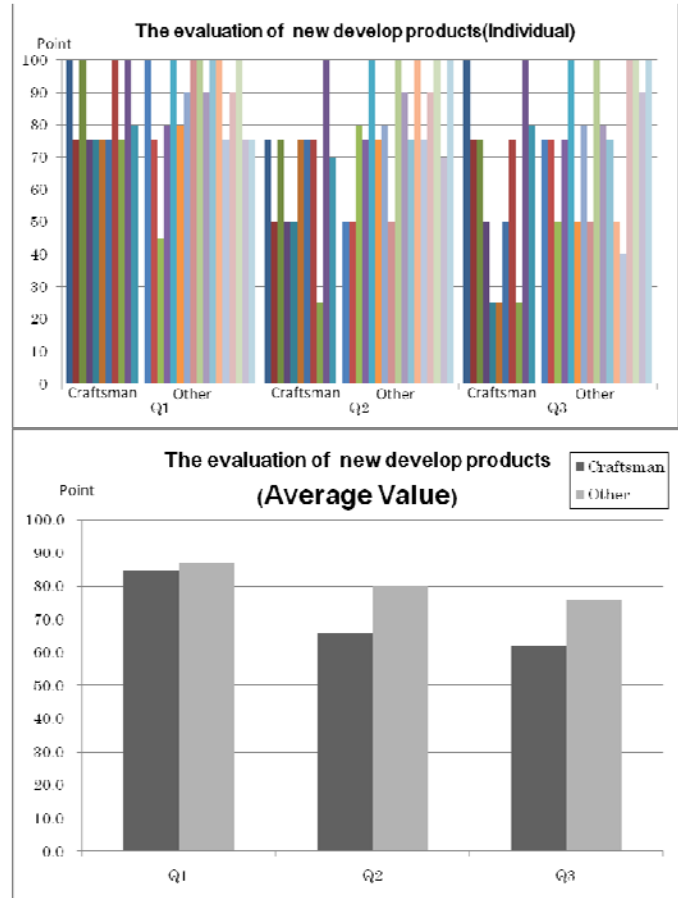


Fig11 Answers to questions 1-3

Q6: Would you like to develop the goods through collaboration together with a cross-industrial company?

Even if it accepts validity by Q5, it is in the tendency which does not actually carry out collaboration.

Difficulty of the communication and the low success rate are considered as a factor by comment of Q15. In order to carry out collaboration, it is necessary to conquer the subject obtained by the reply of Q14.Q15.

Q7: Would you like to develop a collaboration product together with an electronic device company?

The collaboration of the electronic device company is avoided rather than the result of Q6. The probability which does not carry out collaboration to an electronic device company from this result is high.

However, the value of the product tends to be high when a product is completed. I think that the result leads to a market

evaluation of Clause 4.3.

Q8: Was the innovator lecture effective in new product development?

Although the validity of the innovator lecture was lower than the numerical value of the validity of collaboration, the comparatively high numerical value was shown. This lecture which educates an innovator with management capability is evaluated.

Q9: Is a cross-industrial company required for an innovator lecture?

The result became a high numerical value about the necessity for participation of a cross-industrial company. The cross-industrial company is needed also from the result of Q5.Q6. Therefore, the contents of this lecture in which a cross-industrial company participates are evaluated.

About this question, the evaluation of the craftsman was higher. The participation of the cross-industrial company is necessary, but the negative result about the collaboration of the cross-industrial company contradicts it. About this contradiction, an evaluation is more necessary.

Q10: What are the results of an innovator lecture?

A little low result was brought compared with other replies. A result needs to make goods, to find a market and to raise sales. It is necessary to investigate the factor that is a little result against the high evaluation of the lecture in future.

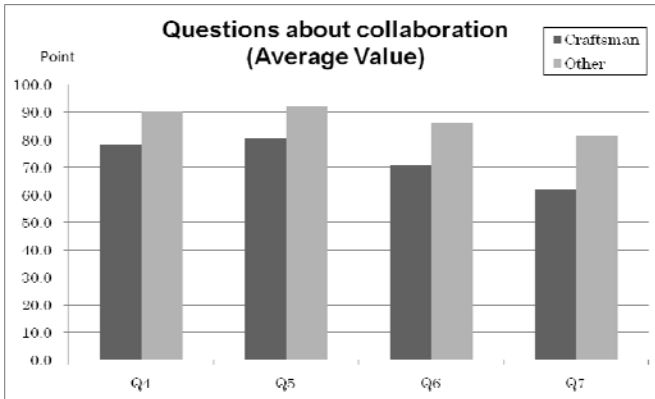


Fig12 Answers to questions 4-7 (average value)

Q11: What is the factor by which the Kutani porcelain USB memory was relatively well accepted in the market? (Description type)

It was replied that this product is a gift and creates a new thing and a high-class feeling. There was also a reply mentioning "harmony of traditional crafts and IT". There are many positive replies like a high evaluation of Q1. We want to suggest that management of these elements is important.

Q12: What kind of management is important in the product development of traditional crafts?

There were technology, cost, quality, differentiation, sale, business, a consumer and media and other various replies. Therefore, we want to suggest that management of all the processes is important. However, we want to suggest that there is a problem that priorities differ depending on people's occupation.

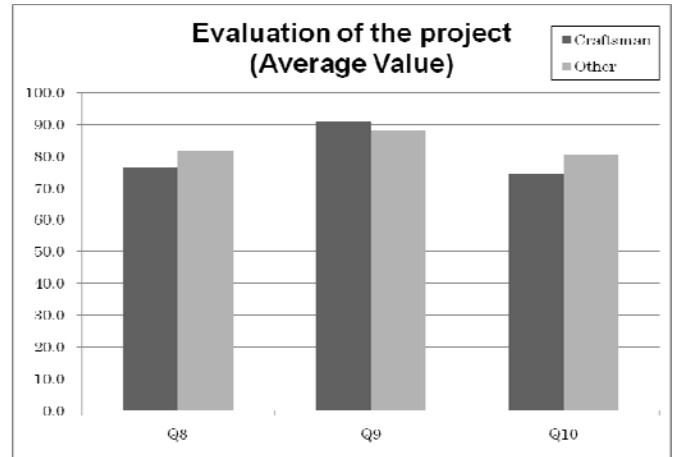


Fig13 Answers to questions 8-10 (average value)

Q13: What is the subject of the product development of a new category?

There were relations between new technology acquisition, utilization, cost and a person and replies include intelligible goods, technical matching, necessity, circulation, common sense (preconceived idea), productive capacity, quality control and creativity. Although there are many replies regarding cost, the problem after summarizing those comments is "what to make." We want to suggest then that the collaboration of a cross-industrial company extends a choice.

Q14: What is important for collaboration by a cross-industrial company?

Most replies addressed the communication for sharing a mutual idea. In the example of Q15, since there is much communication, it is surmised that there are many replies coming from a real experience. As for a cross-industrial company, it is natural that the view is different, and high value is born from a different idea. Therefore, we want to suggest that it is important to manage communication or its required process.

Q15: Please show a failure example in collaboration product development with a cross-industrial company.

Most replies concerned communication. A high cost, market disagreement, and un-commercializing occurred from failure of communication. We want to suggest that it is important to manage communication or its required process like in Q14. It is thought that this lecture was effective as a result that the neutral third party of the university showed the communication management because a good product was

created.

VI. CONCLUSIONS

A serious decline of traditional crafts industry was on-going. It aimed at drawing effective essence in the example of new product development management of the traditional crafts which occurred from the innovator lecture to nurture the pursuer of innovative traditional crafts. The business result and the questionnaire result estimated the example.

The product development through collaboration between a traditional crafts company and IT apparatus company brought a positive effect on traditional crafts industry, according to the questionnaire result, the business result or the result of media. Furthermore, although the average age of the visitors of a traditional crafts market was relatively higher, this initiative has contributed also to future market formation greatly by increasing a user also to a young generation.

As for the factors, the following was mentioned.

- The innovator lecture had an effect on the management training.
- The environment of cross-industrial collaboration was made by participation of the cross-industrial company.
- Management by product development functioned well.

The participants in a traditional crafts innovator lecture consisted of a craftsman, a wholesale store, cross-industrial, the Ishikawa personnel, a supporting group and university staff. The viewpoint which considered management was different depending on the person's positions. We are aware that there was a problem of bias for the evaluation. Moreover, although it was just one case study from university project, it was a future subject that a high-precision element can be

extracted by comparison with other projects. Although the element which can be harnessed for the future through this project has been suggested in this paper, we desired to be utilized as input for the next local activity.

And we hope that the knowledge in this paper contributed to the development of the traditional crafts industry in Ishikawa area.

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