

Technical visits and industrial tourism:

A case study of AVEX Inc.

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Abstract

In Japan, an increase in industrial tourism that makes use of the regions' special characteristics is expected, particularly in Chukyo, with its flourishing manufacturing industry. Specific visitors making such "technical visits" are provided with focused technical and professional information. However, the actual technical visit process has not been sufficiently clarified. Using a case study of AVEX Inc., this research concludes a business model for technical visits and the service content provided for visitors. AVEX Inc. is a small/medium-sized manufacturing business in Chukyo that has successfully commercialized technical visits. Data related to Korean and Chinese visitors' experiences are collected through a survey questionnaire.

Keywords

industrial tourism, technical visit, visitors, TPS, AVEX

1. Introduction

In Japan, new tourism growth markets that utilize regional characteristics, such as industrial tourism, are expected as per the national growth strategy [Suda et al., 2002]. Figure 1 classifies tourism by category [Suda et al., 2002; Saito, 2005; Yoshida, 2006], including industrial tourism. "Industrial tourism" is defined as industrial activity that attempts personal exchanges using industrial cultural property of historical and cultural value, production sites, or industrial products as a tourism target or resource. Industrial tourism can be further categorized as "industrial heritage" or "technology and factory" [Suda et al., 2002]. The characteristics of industrial tourism for industrial heritage are defined in relation to the remains of factories and local industries, the histories and cultures of industries, society and living standards, etc. Examples include experiential tourism to learn through corporate museums and museums that display the history and products of industries, production processes of products, and traditional crafts [Saito, 2005]. In contrast, the characteristics for technology and factories are defined as factory tours and technical visits. Factory tours include general attractions such as the Ryukyu glass village in Okinawa and the Shinano wine factory in Shinshu Matsumoto. Technical visits involve visitors from

other countries or regions whose purpose of visit is to observe advanced technology, production systems, modern industrial facilities, etc. [Saito, 2005].

The Chukyo region is at the core of industrial technology and international exchange as identified in the 5th Comprehensive National Development Plan (1998), the guideline for national land creation based on the National Land Comprehensive Development Law [Suda, 2010]. Thus, Chukyo, the representative industrial production area in Japan, is particularly focused on technical visits that provide specialized and technical information to specific customers. Figure 2 shows the hierarchical needs of technical visits. Technical visits are structured for three purposes: business needs that directly

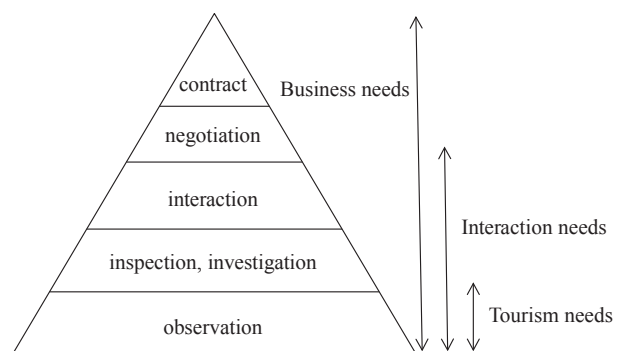


Figure 2: Purposes of technical visits

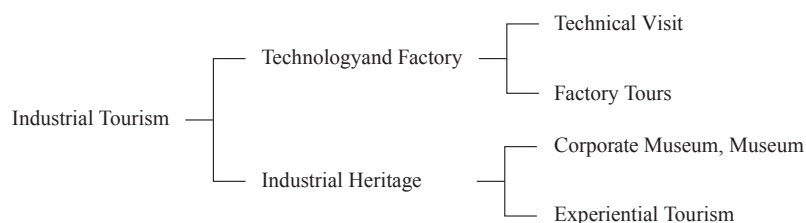


Figure 1: Classification of industrial tourism

aim at negotiation and technology transfer, needs aimed at exchanging information with business partners and other peers in the same industry, needs for collecting information and making excursions such as to international conferences [Kadono, 2002].

As shown in the research of Ide and others, there are many studies that target industrial heritage [Ide *et al.*, 2016]. In contrast, there are not so many studies that target technical visits, which presents a research gap. Therefore, this study clarifies the actual state of technical visits using a case study of AVEX Inc., which is a small/medium manufacturing enterprise in the Chukyo region. The company has commercialized technical visits and has achieved remarkable success.

2. Research target

AVEX is a small precision cutting and grinding processing manufacturer for automotive components, which was founded in 1949. There are three production bases in Japan. The first is the Nagoya factory (Nagoya city, Aichi prefecture), which was founded in 1949 and is mainly engaged in multi-product small-volume production. The second is the Tado factory (Kuwana city, Mie prefecture), which was founded in 2004 and is mainly engaged in mass efficient production. Its aim is to keep the line “simple and easy to understand” such that “abnormality can be seen.” The third is the Kaizu technology center (Kaizu city, Gifu prefecture), which was founded in 2011 and mainly pursues next generation technology. AVEX received a request from a Japanese intermediary company and, in 2004, started accepting factory tours free of charge. AVEX commercialized its technical visits (a factory tour service) following the Lehman Brothers’ collapse in 2008 in order to help support its core manufacturing business. Figure 3 displays the number of visitors (foreign guests) who attended an AVEX technical visit from 2008 to 2010. Even after the technical visit attracted a charge, the number of visitors increased. This suggests that the technical visit is valuable to guests. In 2015, AVEX’s technical visit enterprise became a separate company. In 2017, approximately 3,000 visitors from over 30 countries attended technical visits at AVEX.

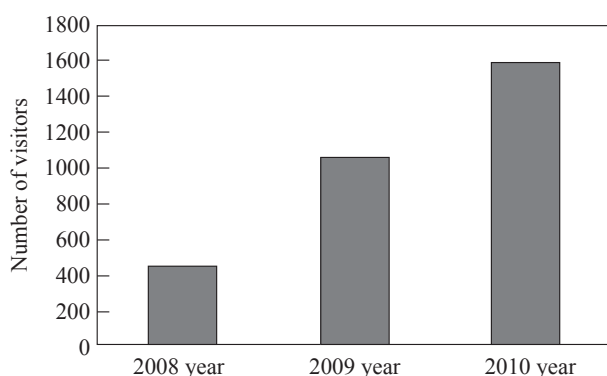


Figure 3: Number of technical visitors to AVEX (2008-2010)

3. Technical visit

3.1 Business model

The AVEX technical visit is part of a tour coordinated by a Japanese intermediary company. They lead visitors and provide tour programs as packages such as tourism and industrial tourism. Tours are conducted in groups of 10-30 people that move from destination to destination by a reserved microbus. There are mainly short-term tours (3-5 nights) as well as extended tours of about two weeks. The tour contents of the AVEX technical visit are planned mainly in the Chukyo area. Visits consist of practical training about production and programs including education, mainly visiting Toyota’s manufacturing-related facilities and museums. Sometimes this includes traditional Japanese sightseeing spots like Tokyo, Osaka, and Kyoto. Many of the client companies (overseas) are engaged in the manufacturing industry in various fields ranging from light industry to heavy industry. Figure 4 shows the flow of business information prior to visitors’ AVEX technical visit. A local consulting company hears the client company’s needs and engages in tour planning and selling. Japanese intermediary companies receive a request from the local consulting company and arrange with the companies they will visit as well as accommodation, transportation, interpreters, etc. AVEX receives requests from Japanese intermediary companies and provides the technical visit to visitors.



Figure 4: Business information flow

3.2 AVEX Technical Visit (AVEX factory tour services)

The purpose of the AVEX technical visit is to share knowledge and experience through visiting manufacturing sites. The visit comprises a two-hour tour to demonstrate the concepts of Japanese management such as management policy and human resource development. Planning contents describe the company profile and philosophy, management activities (policy management, sales strategy, recruitment education strategy, etc.), factory inspection (improvement activity, workplace education, quality control, TPS), and FAQs. Figure 5 shows the factory inspection route in the Tado factory. The “A” and “B” lines explain the importance of quality, internal competitions activities, and “10 minute education.” The “C” line explains the activities concerning second-hand equipment regeneration. The “D” line explains how to use “Kanban” and change point management, and visualization boards (mieruka) for quality. The “E” line explains the efforts to visualize improvement activities, the status of the implementation of safety activities, and quality control.

Details of the planning content are shown in (1)-(7) below.

- (1) Introduction to quality control

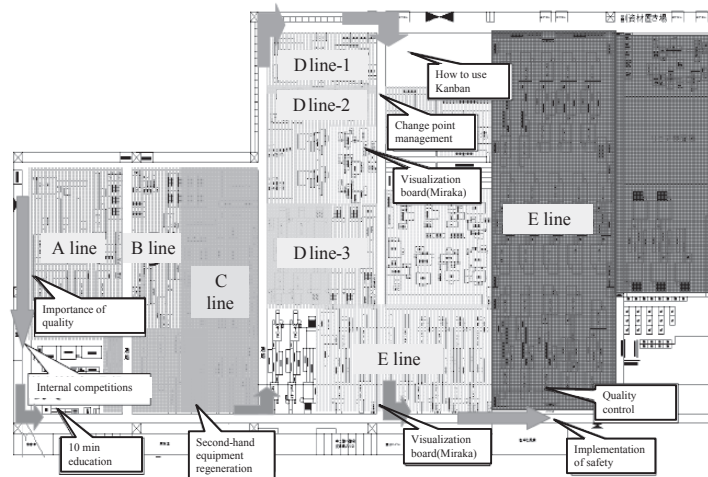


Figure 5: Factory inspection route in Tado

This is an introduction to the concept of Toyota's quality control that extends to the post-process, i.e., customer. This is to make efforts to increase the satisfaction of the post-process by keeping in mind what kind of impact quality has on customers. For example, activities for employees to read their own quality declaration, change point management, visualization of abnormality, abnormal announcement board, etc.

(2) Introduction to Kanban production

Kanban is a mechanism that uses a display tag with information exchanged between each step of the production process. This style of production intends to reduce inventory waste. For example, post-process shows the information such as what they want, when they want, how much they want, and in what way they want. Accordingly, it is possible for the previous process to carry out efficient production. It explains the merits of being able to detect abnormalities easily.

(3) Introduction to visualization activity

This is an introduction to 2S (organize and order) activities that are thoroughly done in the factory. For example, manage the product name and product number and color-coding and eliminate unnecessary items at production sites. By doing that, it explains there are effective utilization of production space and reduction of work movement loss.

(4) Introduction to strengthening activities

To realize highly profitable manufacturing, they introduce the efficient production line with the shortest lead time in the production process. For example, four improvement activities (improve productivity, reduce inventory, reduce defect, purchase cost reduced) are carried out by members of each department.

(5) Introduction of human resource development

This is an introduction to human resource development theory as "a company that values people." For example,

employees aim for self-sustaining human beings, recognize the gap with the present situation against "what it should be," think about what to do in order to fill up the difference, at each level "give the opportunity as a company, make your own goals and make yourself act habitually."

(6) Introduction to improvement activities

This is an introduction to the "zero-zero presentation," which is a new improvement mechanism that draws out the ideas of employees. This is performed five times per year with the aim of having consciousness to numerical value. They summarize the improvement points of work for each team and report it to officers. It is an effort to demonstrate the potential ability to improve the day-to-day operations only with wisdom and without spending money.

(7) Introduction to technology transfer

This is an introduction to facilities restoration activities of second hand equipment that is strategically purchased with old employees and young employees. This is not only aimed at curbing capital investment costs, but also aimed to transfer directly technology to younger employees through an understanding of equipment structure, characteristics, and strengthening.

Figure 6 is a photograph of the technical visit where visitors



Figure 6: Technical visit photograph

see improvement boards.

AVEX has four personal options like chairman, president, officer, and general employee, in charge of a technical visit. However, they never appropriately use the personal options for visitor's industry and job categories, unless specially requested by visitors. Different interpreters are adopted for each intermediary company because they select it themselves. There are also differences in industry knowledge and communication skills among interpreters.

4. Questionnaire survey and consideration

Figure 7 shows the number and nationality of AVEX technical visit visitors. In the nine months between September 2, 2015 and May 31, 2016, 1,736 visitors attended an AVEX technical visit. It can be seen that they come from many different countries. Companies overseas are considered to have the need to learn the way of thinking of Japanese manufacturers advanced in technology. Moreover, as a relative comparison, it can be seen that there are overwhelmingly so many visitors from Korea and China. This also applies to general sightseeing, but the distance between the countries is close and travel costs are relatively inexpensive. This is considered to be promoting an increasing number of visitors from Korea and China. From these, in order to clarify the actual situation of the technical visit, it is necessary to focus on Korea and China with their many visitors.

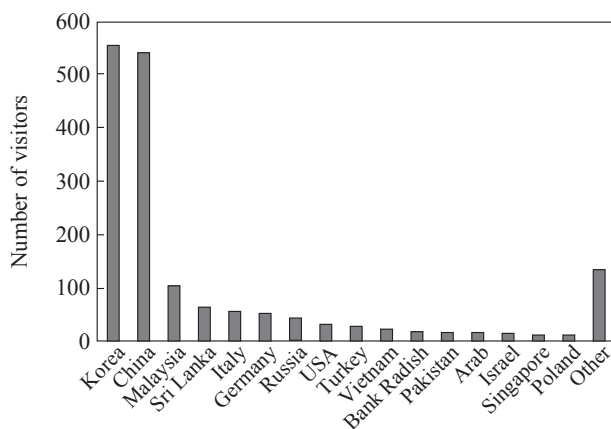


Figure 7: Number of visitors and their nationalities

A survey of technical visit visitors was conducted from September 2, 2015 to December 7, 2015, after receiving technical visit. Responses were returned from 511 visitors to the Nagoya and Tado factories. There were 273 respondents from Korea: 139 visitors to the Tado factory and 134 visitors to the Nagoya factory. There were 238 respondents from China: 145 visitors to the Tado factory and 145 visitors to the Nagoya factory. The survey comprised three question items. Table 1 shows the questionnaire contents and answer items. The first question asked about the purpose of their AVEX technical visit. The response options were: TPS (Toyota Production System), quality control, management policy, 5S, human resource development,

Table 1: Questionnaire contents

Q1. What is the purpose of AVEX Technical Visit?
<input type="checkbox"/> TPS
<input type="checkbox"/> Quality control
<input type="checkbox"/> Management policy
<input type="checkbox"/> 5S
<input type="checkbox"/> Human resource development
<input type="checkbox"/> New technology acquisition
<input type="checkbox"/> New customer development
<input type="checkbox"/> Others
Q2. What kind of training do you wanna receive other than AVEX Technical Visit?
<input type="checkbox"/> TPS
<input type="checkbox"/> Quality control
<input type="checkbox"/> Management policy
<input type="checkbox"/> 5S
<input type="checkbox"/> Human resource development
Q3. How was the evaluation of AVEX Techniocal Visit
<input type="checkbox"/> Very good
<input type="checkbox"/> Good
<input type="checkbox"/> No opinion
<input type="checkbox"/> Bad
<input type="checkbox"/> Very bad

acquisition of new technical information, new customer development, others, (multiple answers were allowed). The second questions asked what kind of training do you want to receive other than the AVEX technical visit? The response options were: TPS, quality control, management policy, 5S, human resource development (multiple answers were allowed). The third questions asked for an evaluation of their AVEX. The response items were very good, good, no opinion, bad, and very bad.

Figures 8-10 graph the responses to Q1. Figure 8 shows the overall results including Korea and China ($n = 511$). Figure 9 shows the results of answers focusing on Korea and Figure 10 shows the results of answers focusing on China, with $n = 273$ and $n = 238$, respectively. The response rate was 76 %. From Figure 8, it can be seen that the number of responses of

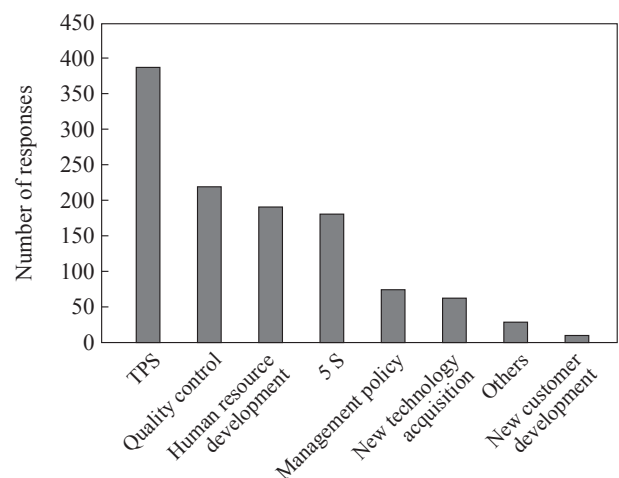


Figure 8: Purpose of AVEX technical visit

Note: Overall $n = 511$

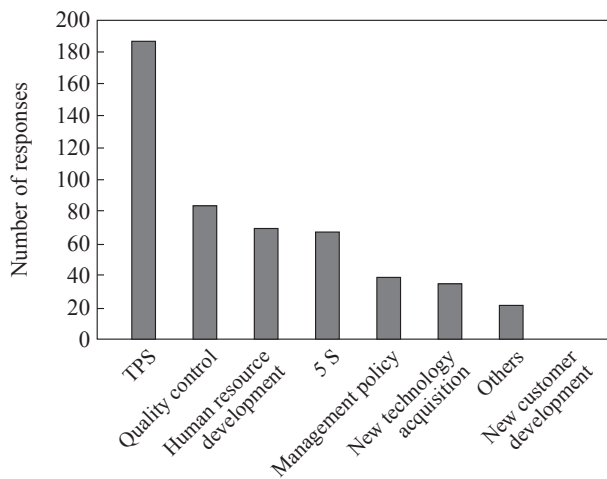


Figure 9: Purpose of AVEX technical visit

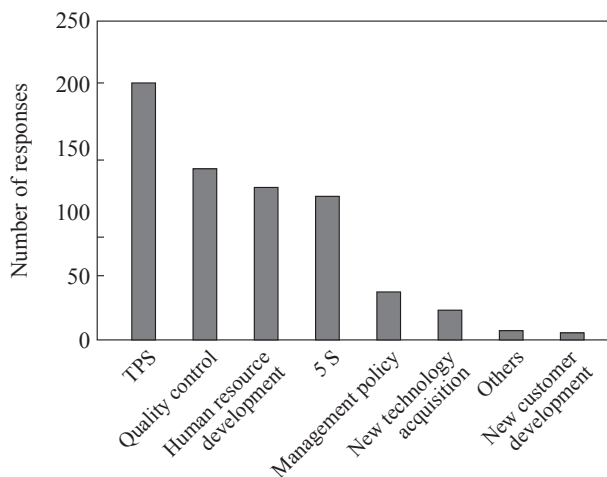
Note: Korea $n = 273$ 

Figure 10: Purpose of AVEX technical visit

Note: China $n = 238$

TPS is large. It seems that there are needs for visitors to learn about the concept of the world-famous Toyota manufacturing. The AVEX technical visit also reflects the concept of Toyota manufacturing, which is recognized as a manufacturing strength of the Chukyo area. As shown in Figures 9 and 10, the number of respondents, TPS, quality control, human resource development, and 5S are frequent responses from Korea and China, and the ranking of the top four items are the same. The number of responses for acquiring new technology information and developing new customers are decreasing; thus, it can be seen that the purpose of the AVEX technical visit mentioned in 3.2 is not business needs, but interaction needs. In addition, the response rate of Chinese customers is generally high, even if it is ranked fourth 5S. The number of 5S responses is 112, and the response rate is high at 47 %. From the high response rate of China, the manufacturing industry in China is comparatively developing with Japanese manufacturing industry, and there are opportunities to develop technically, which is why it is thought that there are needs

for a wide range of training.

Figures 11-13 are the result of answers to question two (What kind of training do you want to attend other than AVEX technical visit?). Figure 11 shows the overall results of answer in Korea and China ($n = 511$). Figure 12 shows the results of answers focusing on Korea ($n = 273$) and Figure 13 shows the results of answers focusing on China ($n = 238$). From Figure 11, it can be seen that there are many answers to human resource development and there is not much differences in the number of responses for quality control, TPS, 5S, and business management. In addition, the ranking of the top three items in questions one and two are exchanged, and the response rate is also maintained high. The top three responses to question one were TPS (388, 76 %), quality control (218, 43 %), human resource development (189, 37 %) and the top three responses to question two were human resource development (298, 55 %), quality control (181, 35 %), and TPS (168, 33 %). From this, it seems

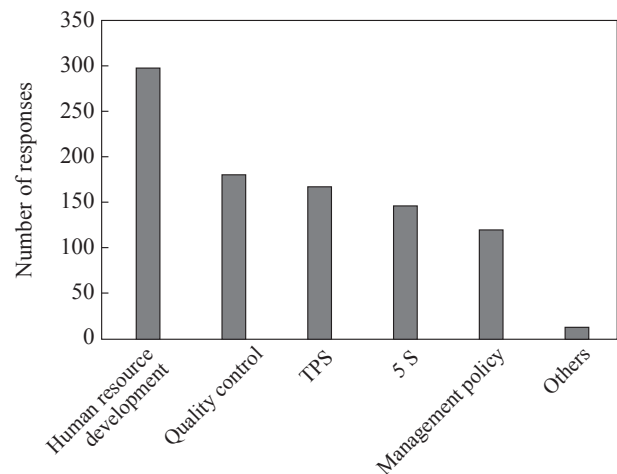


Figure 11: Reasons why visitors want to receive more than the AVEX technical visit

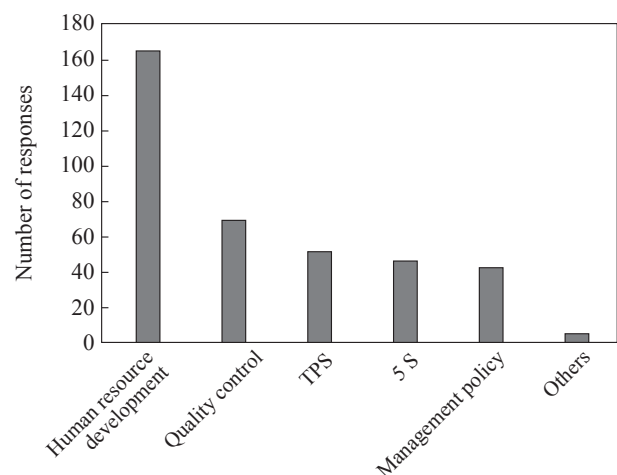
Note: Overall $n = 511$ 

Figure 12: Reasons why visitors want to receive more than the AVEX technical visit

Note: Korea $n = 273$

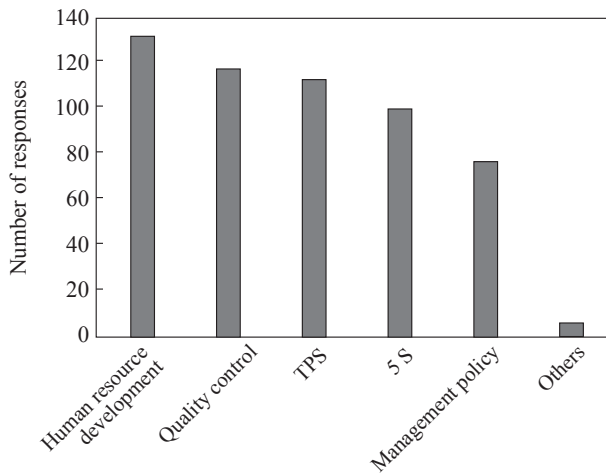


Figure 13: Reasons why visitors want to receive more than the AVEX technical visit

Note: China $n = 238$

that visitors' needs have changed through the AVEX technical visit and that in addition to what they learned, they have a need to learn more. When providing repeat technical visit services, it is necessary to change the composition of the visit content. In addition, even after visitors attended the AVEX technical visit, the number of responses was high. It is considered that there are many visitors who want to receive more concrete training because of the contents that could not be absorbed in this training.

As shown in Figure 12, many visitors (166) from Korea responded to human resources (response rate 61 %). As shown in Figure 13, even if ranked fourth, the number of responses (100) and the response rate (42 %) are high. It's also considered that they have wide needs to get some training as I mentioned in Figure 10.

Figures 14-20 graph the responses to question three regarding the evaluation of the AVEX technical visit. Figure 14 shows the overall results including Korea and China ($n = 511$). Figures 15 and 16 show the results of answers focusing on Ko-

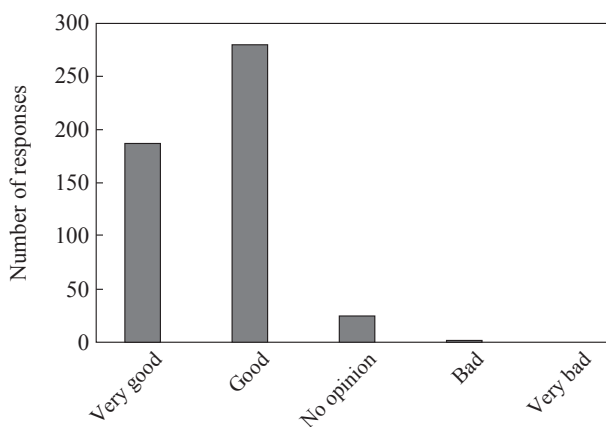


Figure 14: Evaluation of AVEX technical visit

Note: Overall $n = 511$

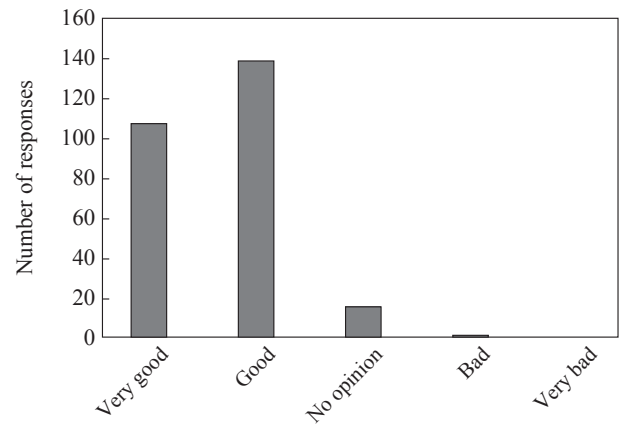


Figure 15: Evaluation of AVEX Technical Visit

Note: Korea $n = 273$

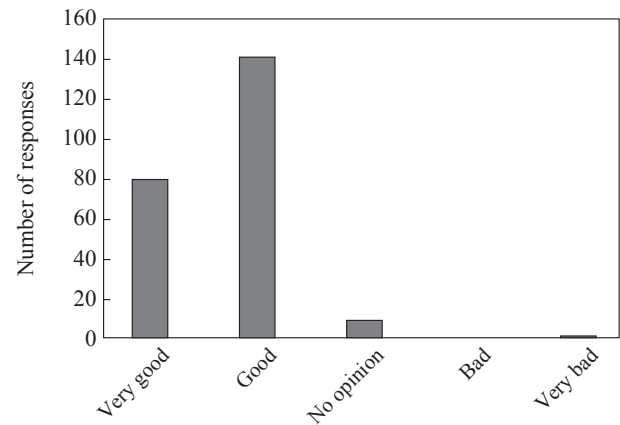


Figure 16: Evaluation of AVEX technical visit

Note China $n = 238$

rea ($n = 273$) and China ($n = 238$), respectively. Figure 17 focuses on visitors from Korea that visited the Tado factory ($n = 139$). Figure 18 focuses on visitors from Korea that visited the Nagoya factory ($n = 134$). Figure 19 focuses on visitors from China that visited the Tado factory ($n = 145$). Figure 20 focuses on visitors from China that visited the Nagoya factory ($n = 93$). According to Figure 14 (evaluation of technical visit), 55 % of visitors answered "good" and 37 % of visitors answered "very good." Ninety-two percent of responses were positive in nature. From this, it can be seen that visitors are generally satisfied with the AVEX technical visit. However, the responses to question three showed a higher number of "good" responses than "very good" responses. From Figures 15 and 16, there are relatively more visitors from Korea who evaluate their visit as very good compared with visitors from China. In general, however, both Korea and China have similar results. According to Figures 17 and 18, visitors from Korea who experienced the AVEX technical visit in the Tado factory evaluated it as "very good" instead of "good." In the Tado factory compared with the Nagoya factory, it has prepared a system considering technical visit for visitors, such as documents visualized

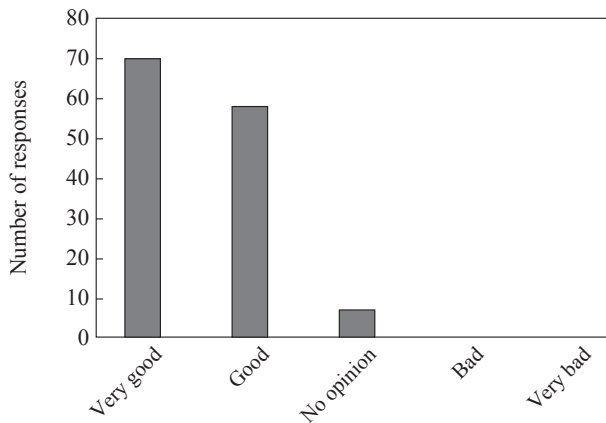


Figure 17: Evaluation of AVEX technical visit
Note: Korea, Tado factory, $n = 139$

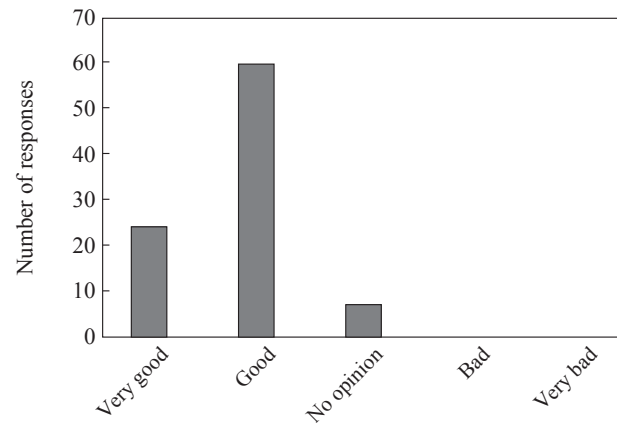


Figure 20: Evaluation of AVEX technical visit
Note: China, Nagoya factory, $n = 511$

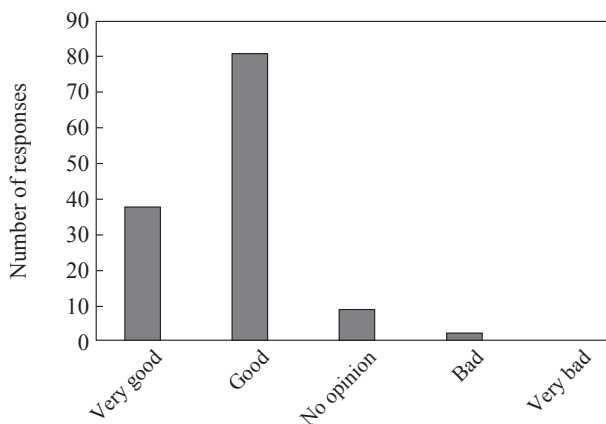


Figure 18: Evaluation of AVEX technical visit
Note: Korea, Nagoya factory, $n = 134$

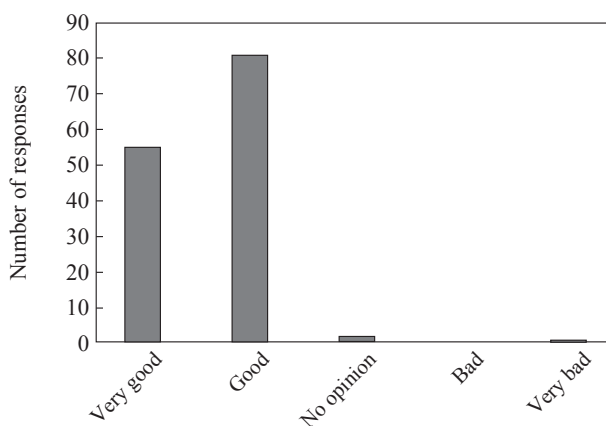


Figure 19: Evaluation of AVEX technical visit
Note: China, Tado factory, $n = 145$

training contents, hospitality space for visitors, and layout that can accept many visitors at once. The Nagoya factory carried out multi-product small-volume production, so core technology part is handled by a skilled technician. This means the core technology is black boxed for visitors and is not included in the technical visit services. This may be a factor for lower-

ing the satisfaction level of visitors who want to learn more. From the comparison of the difference between the Tado and Nagoya factories, it is important to provide documents and layouts adapted to technical visit with the spirit of hospitality-consciousness about sightseeing. From Figures 19 and 20 it can be seen that although it is not like Korea, the number of visitors who answered very good are higher in the Tado factory than the Nagoya factory.

5. Conclusion

This research indicated the business model and the contents of technical visits related to AVEX and conducted in the Chukyo area. Furthermore, it clarified the current state of technical visits related to AVEX by conducting a questionnaire survey and analyzing the number of visitors and nationalities, purposes, evaluations of the AVEX technical visit, and the training they want to receive. It found that the AVEX technical visit corresponds to the interaction needs and the need to learn more about the world-famous TPS. In addition, it is found that documents and layouts adapted to the technical visit are hospitality-conscious and recognize the importance of sightseeing.

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