Abstract—The purpose of this research is to clarify the success factors and subjects of the platform style business model that is based on horizontal cooperation between company groups. Many platforms have in reality failed. Some cases can be considered to have succeeded, although their number is limited. Survey hypotheses were extracted from the prior researches. Case studies and questionnaires have been performed with the company groups that formed platforms based on the horizontal association model with small- and medium-sized manufactures. The causes of the successes and failures were derived as a result of analyses of the factors that were observed in fieldwork from both the outside and inside of the subject organizations. The factors that were observed from the outside are mainly related to business model issues. The internal fieldwork focused primarily on the analysis of the mechanisms by which each participating company group developed cooperation within its network.

Keywords—fieldwork, loose horizontal network, platform business model, small- and medium-sized manufactures.

I. INTRODUCTION

THE purpose of this research is to clarify the success factors and subjects of the platform style business model that is based on horizontal cooperation between company groups.

One of the big problems for start-up companies is a shortage of resources. For example, a start-up technology company is challenged in its supply of different business resources, such as marketing and a brand name, in general. For most small- and medium-sized enterprises, an effective management method can be found in participating in shared platforms with other companies, such as joint receiving orders and cooperative-development activities.

Information and communication technologies such as the Internet facilitate cooperation between companies. In various industries, open and reverse innovations, such as the horizontal-international-specialization model of international supply chains, have prospered. In Japan, a business model of cooperation of various network types that utilized IT was adopted by many small- and medium-sized manufactures in 2000. With the rise of information networks, cooperation beyond localized geographical spaces also became easy, and the economies of smaller cities that had experienced declines were revitalized. However, many companies that utilized horizontal network types of platforms later experienced failure.

In this study, many case studies and questionnaires have been performed with the company groups that formed platforms based on the horizontal association model with small- and medium-sized manufactures. The causes of the successes and failures of the subject company groups were analyzed. Ranges of data were derived as a result of an analysis of the factors that were observed in fieldwork from both the outside and inside of the subject organizations. The factors that were observed from the outside are mainly related to business model issues, for example, the differences in activity of a value chain in relation to different platforms. The internal fieldwork focused primarily on the analysis of the mechanisms by which each participating company group developed cooperation within its network.

Moreover, it has become clear that there are various subjects that are related to the platform that may be attributable to their success. The results of this research are described below.

II. PRECEDENCE RESEARCH AND THE RESEARCH HYPOTHESIS

Regarding a range of significance and of scope, platform is considered in various kinds of research. According to [1], the definition of platform in this research is a mediation that combines the various components the evolution of which was enabled by the Internet, and it is a mechanism of value creation between many companies or in a local society.

A Network externality

According to the extant research on network externality [2], increases in participants and in multiplicity are important.
Because platforms are mediations of relationships and places of matching between companies, the value of the platform for its participants involves the fact that unknown other companies can be encountered through a platform and valuable ideas can be obtained thereby. However, when the relationship between the companies encountered through the platform shifts and a continuous business relationship is established between specific companies, the value of the platform is reduced. For a platform to produce continuous value, merely matching is insufficient; a platform needs to have a value that goes beyond matching.

B Modularizing and An International Specialization

The modularizing [3] of a product or service makes various specializations that are outside of an organization easier to execute. The platform style business model is suitable for the transmutation of industry structures. The platform style business model promotes the conversion to the horizontal-international-specialization model of a value chain or a supply chain from a vertical integration model. Moreover, modularizing facilitates the creation of various values that combine the products and services of various companies.

However, modularization tends to bring about a standardization and open-ization of an interface specification. If a standardization progresses, the dimension of the competition tends to converge on cost competition, such as a merit-based scale and an economy of scope. In such a cost competition, the investment scale expansion by a single firm is more suitable than the platform style because of the ad hoc cooperation of various companies.

C Platform leadership and business ecosystem

According to platform leadership theory [4] and ecosystem theory [5], to analyze the value of the platform style business model, an analysis of the advantage from a dynamic viewpoint is found to be more important than static analyses. Static analyses can assist in simple decision-making, such as quantities to make or purchase and the comparison based on the transaction costs of vertical integration versus horizontal international specialization, for example. According to the dynamic viewpoint, the creation of a market and the growth and expansion of the industry are the values upon which the platform style business model is formed. An innovation serves as a prime mover of the growth of a platform, and the issue is whether the platform has a mechanism that can contribute to the development of an innovation. From the above-mentioned issue, the value of a platform is its multiplicity, and the contingent encounters that occur between various players create a condition that is conducive to innovation. In the design of a platform, a key for growth is found in the elaboration of mechanisms that promotes innovation through new combinations, common rule, and other such mechanisms.

D Open innovation

Regarding Chesbrough [6], the conventional innovation was performed primarily through vertical integration model in one industrial group. However, to correspond to the speed of the transmutation of management environments such as the development of a technique or the diversification of a market, innovations will support these developments in a network of various companies. Innovation involves a high level of uncertainty that involves a necessary process of trial-and-error. The more divergence that a player brings to the process of innovation, the more instances of trial-and-error will be generated by various players. There are many ways for innovation to be achieved. The more the different kinds of attempts made at innovation, which approach problems from different perspectives, such as an external viewpoint, a user's viewpoint, the viewpoint of a different society, or the viewpoint of a different culture, the more it is thought that innovation can be facilitated.

However, various ideas and techniques have value only after they have been put into practical use in society. Innovation in a company with a conventional vertical integration style and market needs are connected to research seeds, and commercial production is completed. Moreover, such companies can perform related marketing and manage supply chains and provide various integrative services. If, in contrast, various companies engage in distribution discretely, innovation is supported in more than one place. To put innovation into practical use and to create value, the activity in various companies must be unified. The more the divergence of the innovation-generating organization, the more the unifying activity is called for. For the platform style business model to be successful, the mechanism in which the integration of innovation by horizontally divergent companies can be performed becomes effective. According to the mechanism of such integration, a more practical and expansive innovation is realizable through a platform.

E Internal environment (social network)

The platform style business model is based on the premise of open cooperation with an external company. An open relationship is not a dominant relationship such as that of a fund relationship or a human relationship. It is, rather, a relationship in which each company can participate or refrain from participating in a platform freely. Moreover, companies that are rivals outside of a platform may cooperate within a platform. If the companies that constitute a platform do not feel sufficiently induced to participate in a platform, such an open horizontal association can easily collapse. Therefore, to increase the value of a platform, it is necessary to address various subjects, such as a shared philosophy of a platform, a suitable model for inducement as well as a definition of contribution, a clarification of roles or rules, and a suitable strategy for power management between participating companies. According to the research on social networks [7], there exist cases in which strong ties are suitable and cases in which weak ties are desirable. The growth of a platform will be supported through the clarification of the appropriate desirable ties for its specific purposes and goals.
According to the research on industrial cluster theory [8] or the Italy model [9], location is important, even with the spread of the Internet, to promote innovation on a platform. Skill and experience, which have been historically accumulated in a region, are beneficial for innovation. Cooperation among various related industries and organizations, such as universities and other research institutions, is considered to play an important role in platforms, especially for start-up companies. However, spreading ties with companies inside and outside of the country openly also promotes innovation, without limiting a network to a single region. It is desirable for the development of a platform as well as for the development of a local society to retain strong positive feedback loops.

Based on the above summary, the following research hypotheses can be considered on the success factors of a platform style business model based on the horizontal association of small- and medium-sized enterprises.

1) For the participants in a platform, there is value beyond a mere matching between companies.
2) A platform is neither a pursuit of a mere merit scale, nor is it a method of cost-cutting.
3) A platform is a method by which to promote the development of innovation based on multiplicity.
4) The platform has a mechanism to facilitate divergence and integration of organizations that generate innovation.
5) There needs to be a mechanism by which the common purpose is shared between each independent player within the group that constitutes a platform, and their interests need to be adjusted appropriately.
6) The platform should be reciprocally connected with the resources of the local society.

III. THE INVESTIGATION AND THE RESULTS

In this surveillance study, a survey based on the hypotheses that have been drawn by the above-mentioned research was conducted. Although mentioned below, many platforms have in reality failed. However, some cases can be considered to have succeeded, although their number is limited. In the survey, a comparative analysis was made of the factors first observed externally in typical cases. The fieldwork, which included a questionnaire survey about a success case, was then performed, and the relationships of each company inside a platform were analyzed.

A The differences in business models

The common feature of the businesses that declined is that they emphasized the market access function by a joint orders-received point-of-contact style. The business model of a joint orders-received point-of-contact style is a mechanism that distributes orders. Because each participating company has only their own individual techniques, the orders that are processed by a certain company cannot be processed by another company, unless they utilize horizontal cooperation. For a participating member, an order is accommodated among member companies, and various orders can be received by the whole platform. It is expected that the platform function can productively accommodate excesses and shortages in orders. An order company can also expect to incur search costs when looking for a manufacturer. Thus, it is thought that a business model for the receipt of joint orders in a point-of-contact style is rational and effective. However, there is no guarantee of a maker's capability or reliability for an order company in a platform. In other words, asymmetrical information cannot be reduced. After all, whenever an order company encounters a maker, the testing cost of ability or reliability is required. Once a maker turns out to be reliable, it is not necessary to order through a platform. Costs can be reduced by conducting a direct transaction to a maker rather than by using a platform.

In such a joint orders-received point-of-contact style business model, the position of the participating company involves only waiting for the order, and it is strictly passive. It is not a mechanism in which participating companies can actively create original new value in its products and services. It is only through cooperation that a buyer will contact the company if an order comes in. For example, in the downward phase of an economic condition (as for Japan, this condition has continued for 20 years or more), members mutually scramble for limited orders.

B The analysis of the successful business model

There are also cases of a comparatively successful small and medium-sized manufacture platform style business model, for example, Kyoto-Shisaku-Net. The trait common to many of these successful cases is that they focused on joint trial-manufacture development. This business model includes a company group with various techniques that maintain loose cooperation and contract outsourcing for a trial-manufacture development process. The merit of the company requesting a trial manufacture is the following. If the product has already been mass-produced, a production technique and production equipment are retained, but in the development of a new product, the production and manufacturing techniques that are not retained may be needed. Moreover, even if the production equipment is retained, productivity may fall upon not achieving the quantity of the production of existing products because of the trial-manufacture process. For a company to cope with customer needs, which are so diversified today, and to tackle the development of various new products, it is worth noting that the various capabilities of external companies can be used temporarily. Moreover, universities, research and other institutions do not have either production facilities or production techniques. Moreover, because neither universities nor research institutions mass produce, and if they do, it is only to test a research idea, it is difficult for them to purchase expensive various production facilities. An external partner can be precious for such institutions so that they may examine a new idea with an actual product.

However, for the company that contracts a trial manufacture, the up-to-date research information available from various external various companies and research laboratories can be useful. Generally, it is only after bringing merchandise to a
market and conducting a cost reduction through volume efficiency that a profit is obtained in the manufacturing industry. In the early research-and-development stages, income flow is negative in general. The unit contract of a trial-manufacture development does not allow for taking charge of the process from which a substantial profit is obtained. If the unit contract of a trial-manufacture development is considered on the surface, only time and effort are accounted for, and revenue is low. However, the fundamental purpose for a company to participate in a platform is the information and experience that are obtained through this trial-manufacture development. It is the aim of a participating company to develop and utilize the information and experience for its own purposes.

C The examination of the first four research hypotheses

The first research hypothesis is that there is a value of more than mere matching between companies for participants in a platform. The main purpose of the former joint orders-received point-of-contact style platform is to introduce the fixed order to a maker, which is mere matching between companies. However, in the case of the latter joint trial-manufacture unit-contract style platform, a trial-manufacture development serves as an innovation, and a new market with new products and new services may be created. The purpose of a trial-manufacture development platform is not limited to mere matching.

The second research hypothesis is that a platform is neither a method of a mere scale-merit pursuit, nor a method of cost-cutting. With regard to the former joint orders-received point-of-contact style platform, the goal of the participating companies is the quantity-production of orders received, and the significance of cooperation is weak. However, in the case of the latter joint trial-manufacture unit-contract style platform, the purpose is trial-manufacture development, and a subsequent quantity production is at least not a primary purpose.

The third research hypothesis is that a platform is a method to promote the emergence of innovation based on a multiplicity. In the case of the former joint orders-received point-of-contact style platform, the utility value of the platform for the company that places an order is concerned with the selection of whether the same product is being produced at its company or whether it is produced in another company. For the company that places an order, lowering the production cost is the purpose for using the platform. However, in the case of the latter joint trial-manufacture unit-contract style platform, the purpose of the platform is a trial-manufacture development, and it is an occasion for various market needs and productive techniques to meet. With the contemporary trend of open innovation, the ratio of external orders of development items increases, as does the opportunity for cooperation from different field techniques. It is expected that new technology is created or that a better product is produced through a trial-manufacture development platform.

The fourth research hypothesis is that the platform has a mechanism that unifies each innovation through horizontal-specialization organizations. This fourth research hypothesis is derived based on the extant research on network analysis in the fashion brand company group in Italy. A brand is produced by the loose cooperation of various companies, and the brand is disseminated to the world and accepted widely. As compared with the case in the extant research, there is no function that creates and disseminates a uniquely new brand by itself in both a joint orders-received point-of-contact style platform and a joint trial-manufacture unit-contract style platform. This is considered to be the problem of Kyoto-Shisaku-Net and is an important subject for the future development.

D The fieldwork inside an organization

To investigate the above-mentioned fifth and sixth research hypotheses, fieldwork was performed on a certain manufacturing-industry platform. A case study was performed at Kyoto-Shisaku-Net, which is an important subject for the future development of Kyoto-Shisaku-Net.

Kyoto-Shisaku-Net is a virtual organization managed together by 20 (as of April, 2012) small- and medium-sized machinery and metal makers in southern Kyoto. The purpose of the organization is to provide solution services that specialize in trial manufacturing. In the platform, a request is received from a customer by one contact point, and companies with some areas of strength cooperate, and components, equipment, and systems are offered quickly.

Kyoto-Shisaku-Net was founded in July, 2001 with ten membership companies at the time of establishment. For 15 years prior to its establishment, the young top managers who had participated in the small- and medium-sized-manufacture society of Kyoto studied Peter Drucker's business administration, and they established Kyoto-Shisaku-Net as means by which to practice Drucker's methods.

2. The vision and philosophy of Kyoto-Shisaku-Net

The vision of Kyoto-Shisaku-Net is to make Kyoto a trial-manufacture processing cluster. In addition to cooperation with various industries of the region, abundant scientific information is accumulated through cooperation with universities and other research institutions, and various technical problems are solved. While a trial manufacture is an important source of new-industry creation, it also contributes to the cultivation of talent and expertise in the region.

For each member company, the mean of the ratio of the amount of money for orders received through Kyoto-Shisaku-Net is only approximately 5%. The member companies do not view Kyoto-Shisaku-Net as a joint orders-received group. Kyoto-Shisaku-Net is regarded as an opportunity for the practice of the instructions of Drucker's business administration methods. For example, organizational principles mandate that a customer's products and innovations are to be pursued regardless of immediate profit and the risk of one's own obsolescence. In the member companies of Kyoto-Shisaku-Net, Drucker's philosophy of management appears everywhere and serves as a foundation of cooperation in the network, as well as for the administrative actions of its company.
E The examination of the remained research hypothesis

The above-mentioned fifth and sixth research hypotheses are considered below. The fifth research hypothesis is that there is a mechanism by which a common purpose is shared between each independent player, which constitutes a platform, and conflicts of interest are adjusted appropriately. This is considered to be a part of the philosophy that centers on Drucker's business administration in Kyoto-Shisaku-Net. A waiting time of several years is required for the participation of new members. Philosophy is shared by participants between waiting times, the aptitude of members are examined, and they are allowed to become members after having been screened. Moreover, the sharing of the philosophy between members and the measure of network development are continuously accomplished through face-to-face communications, even after the member has joined the platform.

The sixth research hypothesis is that the platform is reciprocally connected with the resources of a local society. It has contributed to development of a platform that the company group based in Kyoto is performing autonomously in cooperation with local leading companies or research institutions. The manufacturers who are working globally in various fields, such as Nintendo, Kyocera, OMRON, Murata Manufacturing, NIPPON DENSAN, a Wacoal, and Shimadzu, exist in Kyoto. These Kyoto companies are the forerunners of the venture business. They not only provide surrounding small- and medium-sized manufacturers with the opportunity for various trial-manufacture businesses but have also had a major impact on the mentality of business management. Moreover, the research institutions of Japan including Kyoto University are also based in Kyoto.

F The results of the questionnaire

To clarify further the results of the case study of Kyoto-Shisaku-Net mentioned above, the questionnaire to member companies was implemented. The composition of question items was divided into items in connection with explanatory variables and purpose variables. Explanatory variables identify the views of each participating member company of Kyoto-Shisaku-Net and the present condition of activities, and the purpose variables are the results of the platform for each company, to provide a sense of future developments. The questionnaire was implemented from June to July, 2012, and answers were obtained from 15 companies. The statistical package SPSS was used for the following statistical analyses. The following described only the results of the analysis for the restriction of pagination. The following cause-effect relationships can be inferred from the analyses of the results of the questionnaire.

First, if each participating company understands the philosophy of Kyoto-Shisaku-Net and each one performs a fundamental activity, it will contribute to the spread of the domain identity of each company. That is, it contributes to extending the multiplicity of products and services.

However, to expand the amount of orders received or the number of customers, it is insufficient only to understand and share the philosophy of Kyoto-Shisaku-Net. For an expansion of the amount of orders received and the number of customers of each participating company, the mechanism that promotes joint product development and joint marketing among group companies that exceeds merely acting as an agent of a trial-manufacture item is required. An improvement in the capability of the platform for performing such joint activities is also required.

Moreover, for a participating member company to heighten research and development capabilities and a brand name, the presence of only Kyoto-Shisaku-Net is insufficient. A relationship with multiple networks, such as cooperation with research institutions including universities, is especially useful. It is thought that conducting up-to-date research with prominent universities heightens a brand name, and it leads to an improvement in price bargaining power.

The results of these quantitative analyses fitted with the above-mentioned qualitative analysis.

IV. CONCLUSION AND SUBJECTS FOR FUTURE DISCUSSION

The purpose of this research is to clarify the success factors and the platform style business model based on horizontal cooperation between companies. 6 survey hypotheses were extracted from the extant literature. As a result of having performed fieldwork, such as multiple case studies and a questionnaire, these survey hypotheses all support the object of the fieldwork.

The limitation of this research is that the results of the research are based on the survey of only platforms of the small- and medium-sized manufacturing industry in Japan. For example, the influence on the success factors of the differences in the management environment by each country is a study that should be conducted in the future. Furthermore, if various new service platforms that are based on social networks that are spreading today are studied, different explanatory rationales may be drawn.

REFERENCES

Abstract—This study investigates the relationship between financial development, international trade and economic growth in case of Australia over the period of 1965-2010. The ARDL bounds testing approach to cointegration was applied to examine the long run relationship among the series, while stationarity properties of the variables were tested by applying two structural break tests i.e. Zivot-Andrews (1992) and Clemente et al. (1998).

Our empirical evidence confirmed the long run relationship among the variables. The results showed that financial development, international trade and capital are the drivers of economic growth both in short run as well as in long run. The feedback effect exists between international trade and economic growth. Financial development Granger causes economic growth validating supply-side hypothesis in case of Australia.

Keywords— Financial Development, International Trade, Economic Growth, Australia.

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