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Shih-Chang Hung

Tzu-Hsin Liu

Yee-Yeen Chu

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Value Creation in E-Business: The Case Study of Trend Micro

Shih-Chang Hung

Institute of Technology Management
National Tsing Hua University
Hsinchu, Taiwan
schung@mx.nthu.edu.tw

Tzu-Hsin Liu Yee-Yeen Chu

Department of Industrial Engineering &
Engineering Management
National Tsing Hua University
Hsinchu, Taiwan
d877810@oz.nthu.edu.tw yychu@ie.nthu.edu.tw

Abstract

In this paper, we examine the impact of actor-network field on value creation by integrating the concepts of actor-network and organizational field. In electronic business and commerce, researchers have emphasized the various sources of value creation, yet little attention has been paid to examine the issue from a cognitive or “field” perspective. Using Trend Micro as a case study, the paper demonstrates how a firm can construct a field in the community of Internet to create value and profits. Our approach and analysis are dynamic, rather than static. We show how Trend Micro is able to drive its associated actors, customers and business members to develop an evolutionary, dynamic actor-network field that serves to decrease uncertainty and increase trust. This, in turn, creates a lock-in effect and thus leads to enormous value creation.

Keywords: Actor-network Field, Trend Micro, E-Business, Case Study

1. Introduction

The rise of the Internet creates many advantages for e-business, particularly in increasing value [1] between transaction parties. The study, based on institutional theory [9,29], explains how organizations use the Internet to construct an effective institution or field to create value. According to Williamson [35] and Coase [7], this paper regards the source of value creation as efficiency increase and uncertainty decrease. We also observe the value creation is not a static process but a dynamic evolution.

Although some of the new institutionalism theorists argued the focus of institutional theory is on stability [e.g., 13,15,32] the alternative school of institutional theory stresses on the importance of institutional change [e.g., 3,5,8,26]. Especially, as Greenwood, Suddaby, and Hinings [14: 58] noted, most of the previous studies of field emphasized much less on field dynamics to understand “how and why institutionalized practices within a field atrophy or change.” Lawrence, Winn, and Jennings [21] further proposed adding the temporal characteristic is necessary for investigations of the

dynamics of institutionalization. In the case of Trend Micro, the institutionalized process at a field level is a dynamic process. Particularly, the rise of information technology such as the Internet per se means a dramatic change; it has substantial implication for organizational network forms [28]. Based on the approaches of institutional dynamic, we thus consider the institutional theory is applicable to exploring the effect of field change on value creation.

According to the revenue of Trend Micro from 1991 to 1999 (see Figure 1), we find an interesting phenomenon. That is, the growth of revenue is practically slow before 1995; however, the growth of revenue is soaring after 1995. The dramatic change is due to the rise of the Internet, which forms the division of two entirely different actor-network fields of Trend Micro: off-line actor-network field before and on-line actor-network field after the emergence of the Internet. The on-line actor-network field, providing an efficient and integrated on-line anti-virus service, accelerates the great growth of revenue. This leads us to understanding how Trend Micro uses an on-line actor-network field to create value.

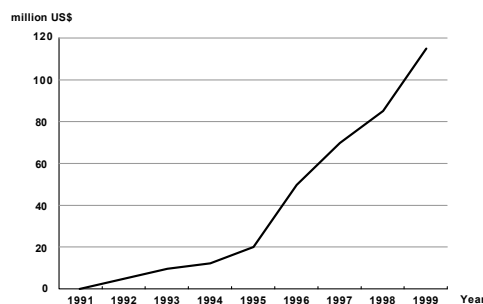


Figure 1. Revenues of Trend Micro from 1991 to 1999

(Data source: @Trend, 1999)

In this paper, we first propose an important construct of actor-network field and hold that the evolution of actor-network field is a dynamic process. Second, this study argues that organizations could effectively use the Internet to construct an on-line actor-network field, which manages and provides a collective recognized interactive model, to reduce environmental uncertainty, increase efficiency, and finally create value between actors. These arguments are shown in Figure 2. An on-line

actor-network field, based on the concepts of both organizational field and actor-network, enables actors of the field to follow the new rules, belief, and technical systems to create the shared values. Furthermore, we use a single case study of Trend Micro to clarify these arguments and to explain how the organization uses the Internet to construct an on-line actor-network field and to create value.

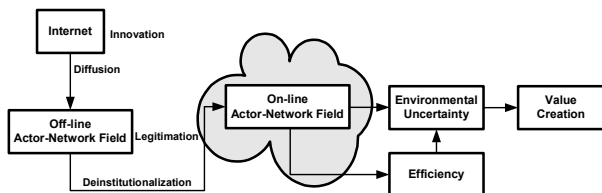


Figure 2. Conceptual model of the value creation

The paper is organized into three sections. First, we discuss the institutionalized process and the construct of actor-network field; also, we explore the relationship between on-line actor-network field and value creation. Second, the method and data of this study are introduced. Next, we analyze the value creation by Trend Micro. Finally, we summarize the results and contributions, and propose implications for firm strategies.

2. Theoretical Background

Lawrence, Winn, and Jennings [21] indicate “the process of institutionalization: objects are first recognized, then accepted by relatively few actors, and then widely diffused and broadly accepted within a field,” and finally reach to saturation and complete legitimacy [38]. During the institutionalized process, the concept of diffusion is viewed as a process in which an initial idea is transmitted in a social world [19], and consists the notion of searching legitimation of organizations [3]. Lawrence, Winn, and Jennings [21] hence suggested that institutionalization begin at the emergence of the new innovation such as new practices, rules, or technologies, and end prior to deinstitutionalization. The process of institutionalization, that is, an innovation at birth, is diffused, and then remains diffuseness throughout the field, and finally establishes legitimation.

For the discussion of field, we focused on a new term of field, namely, an actor-network field, based on the two constructs of “actor-network” [6,18,20] and “organizational field” [9]. Organizational field is defined by DiMaggio and Powell [9: 148] as “organizations that, in the aggregate, constitute a recognized area of institutional life: key suppliers, resources and product customers, regulatory agencies, and other organizations that provide similar services or products.” In other words, organizational field, a large and dynamic network, concerns the relationships between members and then

shapes an institution that affects the members of the field [3]. The concept of organizational field is also defined as “a set of equivalent firms that all produce the same product or service” [1]. Boons and Strannegård [3] suggested that the actors, in an organizational field, adapt to and contribute to the pressures and values of the field, and thus help materialize the characteristics of the organizational field. The organizational actors constituted an organizational field around a central issue and they had more interaction than the organizations outside the field [29,15]. The choices of organizational action, therefore, are not only determined by internal arrangements of organizations but also determined by the legitimate options defined by the actors in a field [29]. Greenwood and Hinings [13], additionally, stated that the organizational field is considered as with a taken-for-granted quality, which enables organizational actors to unconsciously accept the prevailing template as an appropriate, right, and proper way of doing things.

However, the organizational field concept is insufficiently attuned to all the possible actors’ relationships within a field. As [11] proposed the critique: institutional analysis disregards individual actors. DiMaggio and Powell [10] also recognized the institutional theory neglects the analysis of adding individual actors. The members of an organizational field are often organizations, but the actors of field are, rigidly defined, not only organizations but also, probably, individual actors. Because the “resources and product customers” [9] within a field is not solely the participating business customers; the individual actors might be also the significant ones in the field.

In contrast, “actor-network field” concept, combining the two constructs of “actor-network” [6,18] and “organizational field” [9], explicitly highlights the analysis of the institution constructed by relations of all possible actors in a field. The actor-network concept, as proposed by Latour [18] and Callon [6], concerned about “how actors, human as well as nonhuman, become “convinced” that a technology, artifact, text, image, and so on, is real” [3]. This concept stresses that a stable actor-network is established from the interrelations of the actors’ common activities. As Latour [18] pointed out, the survival of an action network implies that it provides the actors’ identity and the network stability, in turn, accepted by actors. Boons and Strannegård [3] also argued that the goal of the network constructed by actors is for network stability. Nevertheless, the term, “actor-network,” would lack the implication of organizational field. As Scott [32] noted, the “network” would be depicted as the flows or linkages shaped by participants. In contrast, the field, a common channel of discussion and dialogue for actors [15], is an arena of institutional life [9].

This paper thus integrates the concepts of organizational field and of actor-network into the “actor-network field,” and concerns the institutional interaction network of all possible actors in a field, including organizations and individual actors. Furthermore, we define the “actor-network field” as the institutionalized life area [9], providing a common channel of discussion and dialogue [15] where actors, organizations or individual actors [6,20], in a dynamic network linkages [3,21], experience the shared values and pressures collectively [3,14], and then the established field also affects the actors of the field.

While a company uses the Internet to provide an effective and dependable service structure in actor-network field, the field will be formed an on-line actor-network field. The on-line actor-network field can be viewed as a reliable interactive institution for actors to lower environmental uncertainty. As North [25] noted, in an economic exchange environment, institutions are dependable and efficient frameworks so that institutions could contribute to uncertainty reductions. Furthermore, the on-line actor-network field also has the efficient property conducing to environmental uncertainty decrease and value creation.

3. Method and Data

3.1 Research Strategy and Sample

In this study, we choose Trend Micro as a single case study to explore the unique phenomenon of value creation, which is through on-line actor-network field. Based on the two reasons as follows, this study draws on Trend Micro as a single case study. First, for anti-virus service firms, especially anti-virus e-business firms, Trend Micro can be a business with considerable competitive advantages over the globe. Second, the Internet swept over Trend Micro in 1995, which displayed an interesting point of dramatic change of value creation in Trend Micro. These subtle phenomena lead us to explore the real cause of the remarkable achievement.

3.2 Data Collection

Data collection, data analysis, and conceptualization are hard to be divided in the process of investigation, so we also adopt the principle of iterative of Glaser and Strauss [12] in the process of data collection. The closure point of data collection in this paper is when theoretical saturation [12] is reached.

Besides, to increase the construct validity of this paper, according to the principle of data collection as Yin [37] suggested, we use multiple sources of evidence. First, we collect the secondary data through Trend Micro’s webs and current press information to preliminarily gather the

historical events in Trend Micro. Second, because of the incomplete information in the first stage, we use focused interviews [24] and e-mails to fill the gap of historical events in Trend Micro to collect the first data. Five staff of Trend Micro, whose positions are marketing managers, sales manager, product manager, and the producer of web site of Trend Micro, respectively, are interviewed. Besides, we also receive and review the manuals of products and partners of Trend Micro with the assistance of these interviewees. These data are helpful to reconstruct all the evidence. The means we use is founded on the method of “triangulation” proposed by Patton [27] to develop the convergence of multiple sources of evidence and heighten construct validity [37].

Moreover, to increase the reliability of the information in the case study, this study establishes “a chain of evidence” [37] to illustrate the exploring process of a question, evidence, and results. This outcome of the exploring process is respectively pictured in Figure 1, Figure 3, and Figure 4.

3.3 Data Analysis

In data analysis, this paper uses the two analytical techniques of “time-series” and “pattern-matching” [37]. In the first stage of analysis, we use the analytical technique of chronologies, a special form of time-series analysis. Yin [37] proposed allocating events in a chronology can make researchers clearly understand the causal relationship of events in a specific period.

In the second stage of analysis, the technique of “pattern-matching” is employed. This technique compares the consistence between an empirical pattern and the pattern of theoretical proposition. Yin [37] further argued if the two patterns coincide, it can reinforce internal validity.

In next section we discuss the evolution of Trend Micro in a longitudinal approach. Also, the detailed discovery showing the causal relationship between on-line actor-network field and value creation is illustrated in the following sections.

4. The Analysis of Value Creation by Trend Micro

This paper collects and chronicles the historic events in Trend Micro, as shown in Table 1. We employ a longitudinal approach to analyze the historic events in Trend Micro by dividing them into four stages: (1) the stage of foundations: 1988-1989; (2) the stage of independent anti-virus product development: 1990-1994; (3) the stage of expanding Internet anti-virus service: 1995-1998; and (4) the stage of integrated Internet service: 1999-2002. We further analyze and illustrate the

four periods of value creation by Trend Micro (see Figure 3).

Table 1. The chronology in Trend Micro

Year	Historic events
2001	Market HouseCall, integrated with the patent of Trojan System Cleaner.
2001	Market PC-cillin2002.
2000	Ally itself with UniSVR Corporation providing eDoctor anti-virus outsourcing service.
1999	Market "eManager" software for e-mails security management.
1999	Market "WebManager" software for webs security management.
1999	Establish five eDoctor laboratories, in America, Germany, Taiwan, Japan, and the Philippines; undertake the local eDoctor business.
1999	Unveil "eDoctor" anti-virus outsourcing service.
1998	Unveil "Trend Virus Control SystemTM."
1997	"On The Fly" was granted American technological patent.
1996	Unveil InterScan VirusWall.
1996	Unveil the anti-virus system of "ScanMail for Exchange" for Microsoft Exchange Server.
1996	Unveil InterScan WebProtect, a group software anti-virus system.
1996	Develop the patent technology of "Macro TrapTM" to intercept and clean the unknown document macro viruses.
1996	Develop ScanMail for Lotus Notes.
1996	Market HouseCall for on-line scan virus.
1995	Unveil PC-cillin95.
1994	Unveil "Mobile Protect" system.
1994	Ally itself with Intel to market "Intel LANDesk Virus Protect" and provide the network security and anti-virus technology for Intel.
1993	Unveil StationLock, an interface card designed for anti-virus and access control.
1992	Develop "Chipaway Virus"; Intel integrated "Chipaway Virus" into the network card of Ethernet Express 16.
1991	"Server Protect," an anti-virus core technology, was authorized to Intel and marketed to European and America by the renamed brand of 'LANDesk Virus Protect'.
1990	Market PC-cillin.
1988	Founded in California USA; use a "rule-based" method of the monitor viruses' behavior to detect the unknown viruses.

4.1 The stage of foundations, 1988-1989

The actor-network field of Trend Micro in this period is shown as Stage I in Figure 3. In this period, Trend Micro did not really launch the anti-virus business. The focus of the business strategy was on allying itself with an anti-pirated software firm such as Rainbow Technologies Corporation in order to establish the business foundations. Although the boot-type virus happened to rise, it had no serious impact on businesses and end-users. The computer users, hence, were not significantly influenced by the uncertainty of virus attack. On the other hand, PC-cillin did not come to the market in this stage, though this product was successfully developed. Trend Micro with its customers, consequently, did not construct a recognized actor-network field.

4.2 The stage of independent anti-virus product development, 1990-1994

The actor-network field of Trend Micro in this period is shown as Stage II in Figure 3. There are two focuses of the business strategy in this phase. First, Trend Micro allied itself with such computer hardware companies as Intel to enhance the reputation of Trend Micro in

America. Second, it established the PC-cillin agencies through the world to expand the market channels. In this period, Macro viruses happened to appear; meanwhile, Trend Micro's anti-virus service provided the mailing service of the quarterly-updated computer virus codes. This practice was accompanied with two shortcomings. First, the uncertainty of virus attack that customers met was increasing between updating services of virus codes. Second, the cost of mail service was high between transaction parties. For service organizations, it is essential that they deliver the efficient service that could create advantages and economize associated costs [16]. However, according to the inefficient off-line actor-network field of Trend Micro and its parties, the type of field failed to effectively decrease environmental uncertainty resulting from computer viruses. The performance of value creation during this period, accordingly, was defined as a value creation of low level.

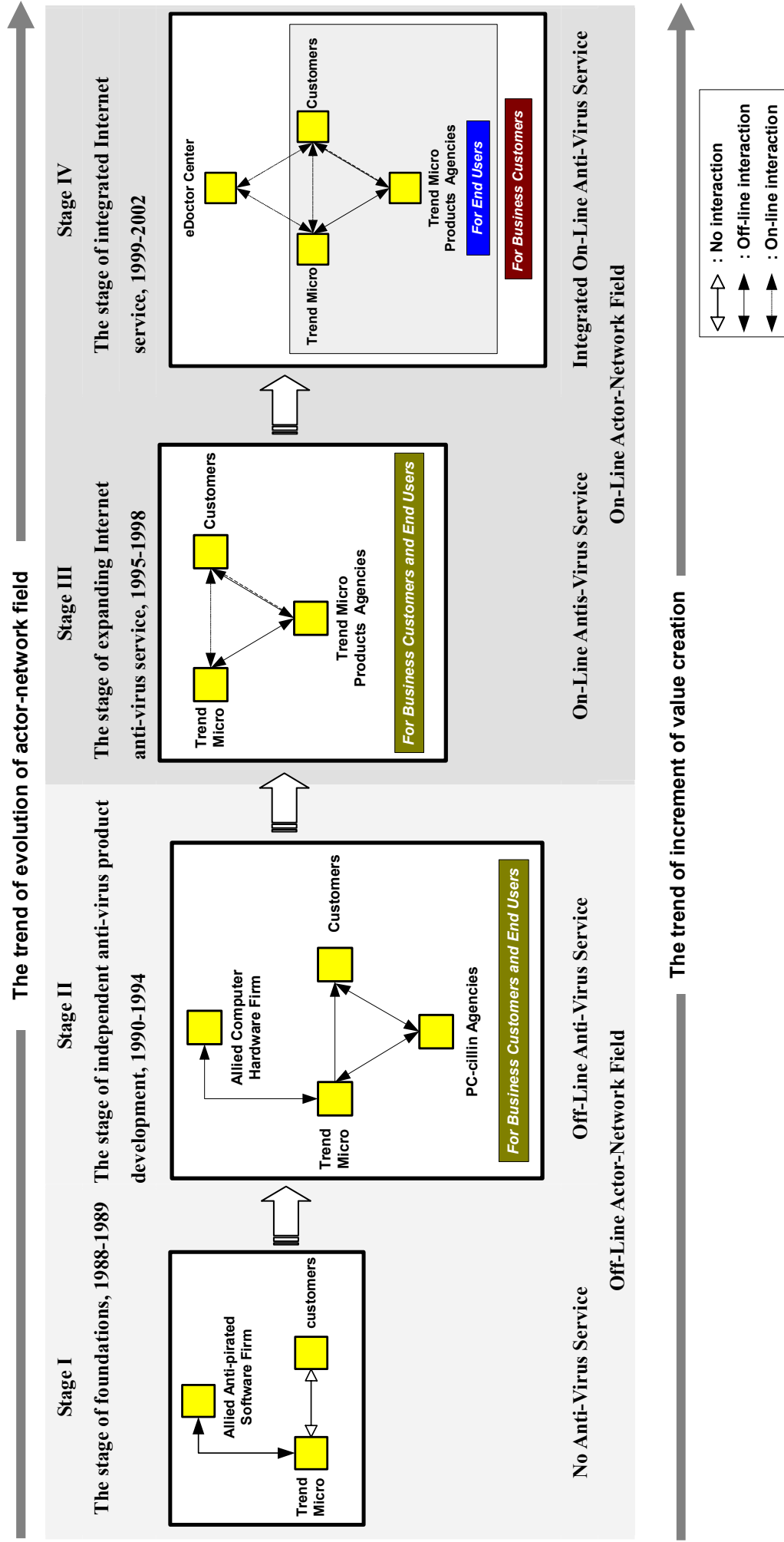


Figure 3. The dynamic evolution of actor-network field in Trend Micro

4.3 The stage of expanding Internet anti-virus service, 1995-1998

The actor-network field of Trend Micro in this period is shown as Stage III in Figure 3. In this period, the focus of business strategy was on Internet anti-virus service. Hence, it significantly changed the actor-network field of Trend Micro with its parties. For example, in 1995, Trend Micro developed the technique of 'One Button Update' that customers could update the computer virus codes on the Internet in real time. In 1996, Trend Micro developed a series of anti-virus products for enterprises such as OfficeScan, ScanMail for Exchange, InterScan VirusWall, and InterScan WebProtect. In 1998, Trend Micro developed Trend Virus Control System (TVCS), a centralized management platform, which enabled the information management department to setup, monitor, and manage all anti-virus softwares. The Internet anti-virus services or products lead to an efficient on-line actor-network field and regulate the behaviors of the field members in a recognized interactive institution. This kind of field, therefore, can decrease environmental uncertainty caused by viruses. As argued in [25], institutions are characterized with dependable and efficient frameworks in order that they can help reduce uncertainty. Many studies also show the evidence that the Internet could be employed to accelerate the service delivery and reduce service costs and uncertainty [e.g., 4,16,23,34]. The performance of value creation in this period, accordingly, was defined as a value creation of middle-high level.

4.4 The stage of integrated Internet service, 1999-2002

The actor-network field of Trend Micro in this period is shown as Stage IV in Figure 3. In this period, Trend Micro continued to provide the Internet anti-virus pattern of the last period for their end-user customers; moreover, Trend Micro provided a more integrated anti-virus Internet service. For example, PC-cillin2002 not only has the functions of the previous editions but also incorporates the function of the personal firewall. That is, end-user customers in the on-line actor-network field have access to services of efficiency and decreased uncertainty of virus attack owing to a more integrated Internet service actor-network field. For business customers, the focus business strategy of Trend Micro was on using eDoctor service to provide an integrated Internet anti-virus service. eDoctor offers the OfficeScan, ServerProtect, ScanMail, InterScan VirusWall and Trend Virus Control System with authorization. Business customers obtained eDoctor anti-virus service from

eDoctor service center, whose anti-virus technology was supported by Trend Micro. Wise and Morrison [36] showed businesses need to consider how to lower uncertainty, e.g., "Which exchanges should we participate in?" or "What software should we invest in?" Besides, due to the devotion to IT activities involving uncertainty, organizations need to decide which IT activities should stay in-house and which should outsource to the specific expert parties [22]. Lacity and Willcocks [17] suggested that selective IT sourcing be the most contribution to cost reduction among the three alternatives of total insourcing, total outsourcing, and selective sourcing. According to the implication of these authors' arguments, if a business can provide an integrated service for its customers and customers choose selective IT sourcing, it could decrease uncertainty through customers' neglect. The eDoctor and PC-cillin2002 integrated the Internet anti-virus service, thus a more institutionalized and efficient on-line actor-network field that further significantly lowered the uncertainty of virus attack. The performance of value creation during this period, accordingly, was defined as a value creation of high level.

5. Results and Conclusions

Based on the theoretical and empirical discussion, we illustrate the results of analysis as shown in Figure 4. Figure 4 shows the processes and results of Trend Micro using the on-line actor-network to create transaction value. The evolution process is from 1987 to 2002. In the period, the three main types of computer virus appeared, i.e. the boot-type virus, the macro virus, and the e-mail virus. In the first stage of this case, from 1988 to 1989, the boot-type viruses appeared. In the second stage, from 1990 to 1994, the macro virus emerged.

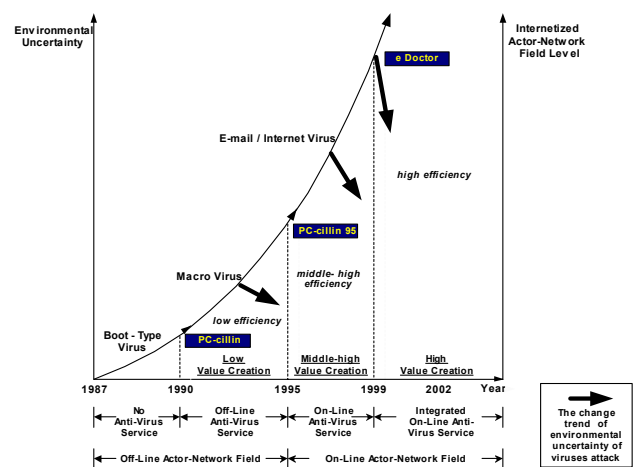


Figure 4. The curve of create value of Trend Micro

And in the third and fourth stages, from 1995 until

now, the most popular type of virus is the e-mail virus. The boundaries of these stages are just the emergence of three representative products, PC-cillin, PC-cillin 95, and eDoctor. Before 1995, prior to the PC-cillin 95 entered the market; Trend Micro with its actors of the field remained an off-line actor-network field. The anti-virus service of this period is called “off-line anti-virus service.” After 1995, the PC-cillin 95, especially eDoctor, entered the market; Trend Micro with its actors of the field transforms an on-line actor-network field. From 1995 to 1999, the anti-virus service is called “on-line anti-virus service.” Since 1999, the anti-virus service has been called “integrated on-line anti-virus service.” The evolution of actor-network field also presents three levels of efficiency, three changing trends of environmental uncertainty of virus attack, and three levels of value creation. As the Internetized level of the on-line actor-network field increases, the environmental uncertainty of virus attack is continually decreased, the efficiency is unceasingly improved, and the value creation is thus constantly increased.

In sum, we argue that, first, the higher the level of the Internetized actor-network field, the lower the uncertainty of virus attack. Second, the higher the level of the Internetized actor-network field, the higher the efficiency in the anti-virus service. Third, the higher the efficiency in the anti-virus service, the lower the uncertainty of virus attack. Fourth, the higher the level of the integrated Internet anti-virus service, the lower the uncertainty of virus attack. Finally, the lower the uncertainty of virus attack, the higher value creation.

In the longitudinal analysis of this case study, we find that because the former off-line actor-network field of Trend Micro lacks efficiency in the first two stages, the transaction value could not be significantly increased. In contrast, the on-line actor-network field in the later two stages can lower the uncertainty of virus attack and further increase value creation in that it has high efficiency.

Consequently, this paper makes two contributions. First, we propose an important and novelty construct “actor-network field,” based on a perspective of dynamic evolution. Second, according to the case of Trend Micro, the important issue arises in this paper that organizations can effectively use the Internet to construct an on-line actor-network field to facilitate the reduction in uncertainty and finally contribute to the value creation between actors.

References

- [1] Alter, C. and Hage, J. *Organizations working together*. Newbury Park, CA: Sage, 1993.
- [2] Amit, R. and Zott, C. “Value creation in e-business,”

- Strategic Management Journal*, 2001, 22, 493-520.
- [3] Boons, F. and Strannegård, L. “Organizations coping with their natural environment,” *International Studies of Management & Organization*, 2000, Fall, 30(3), 7-17.
- [4] Boudreau, M.-C., Loch, K. D., Robey, D., and Staub, D. “Going global: Using information technology to advance the competitiveness of the virtual transnational organization,” *Academy of Management Executive*, 1998, 12(4): 120-128.
- [5] Brunsson, N. and Olsen, J. P., *The reforming organization*, London: Routledge, 1993.
- [6] Callon, M. “Techno-Economic Networks and Irreversibility.” In *A sociology of monsters: Essays on power, technology, and domination*, ed. J. Law, London: Routledge, 1991, 132-161.
- [7] Coase, R. “The nature of the firm,” *Economica*, 1937, 4: 386-405. Reprinted in: Coase, R., 1988, *The firm, the market and the law*, Chicago: University of Chicago Press.
- [8] Czarniawska, B. and Sevón, G. *Translating organizational change*, eds. 1996. Berlin: de Gruyter.
- [9] DiMaggio, P. J. and Powell, W. W. “The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields,” *American Sociological Review*, 1983, 48: 147-160.
- [10] DiMaggio, P. J. and Powell, W. W. *The new institutionalism in organizational analysis*, Chicago: University of Chicago Press, 1991.
- [11] Giddens, A. *The constitution of society: Outline of the theory of structuration*, Berkeley: University of California Press, 1984.
- [12] Glaser, B. G. and Strauss, A. L. *The discovery of grounded theory*, Chicago, IL: Aldine, 1967.
- [13] Greenwood, R. and Hinings, C. R. “Understanding radical organizational change: Bringing together the old and the new institutionalism,” *Academy of Management Review*, 1996, 21(4), 1022-1054.
- [14] Greenwood, R. Suddaby, R., and Hinings, C. R., “Theorizing change: The role of professional associations in the transformation of institutionalized fields,” *Academy of Management Journal*, 2002, 45(1), 58-80.
- [15] Hoffman, A. J. 1999. “Institutional evolution and change: Environmentalism and the U.S. chemical industry,” *Academy of Management Journal*, 42(4), 351-371.
- [16] Kelley, S. W. “Efficiency in service delivery: Technological or humanistic approaches?” *The Journal of Service Marketing*, 1989, summer, 3(3), 43-50.
- [17] Lacity, M. and Willcocks, L. Best practices in information technology sourcing, *Oxford Executive Research Briefings*, 1996, Oxford, England.
- [18] Latour, B. “The power of associations,” in *Power*,

- action and belief. A new sociology of knowledge?* J. Law, (ed.), 261-277, London: Routledge and Kegan Paul, 1986.
- [19] Latour, B. *Aramis or the love of technology*. Cambridge: Harvard University Press, 1996.
- [20] Latour, B. *Science in action: How to follow scientists and engineers through society*, Cambridge: Harvard University Press, 1987.
- [21] Lawrence, T. B., Winn, M. I., and Jennings, P. D. "The temporal dynamics of institutionalization," *Academy of Management Review*, 2001, 26(4), 624-644.
- [22] Lonsdale, C. "Lock-in to supplier dominance: On the dangers of asset specificity for the outsourcing decision," *Journal of Supply Chain Management*, 2001, Spring, 22-27.
- [23] Matthyssens, P. and Vandenbempt, K. "Creating competitive advantage in industrial services," *Journal of Business & Industrial Marketing*, 1998, 13(4/5), 339-355.
- [24] Merton, R. K., Fiske, M., and Kendall, P. L. *The focused interview: A manual of problems and procedures*, 2nd ed., New York: Free Press, 1990.
- [25] North, D. C. *Institutions, institutional change and economic performance*, Cambridge University Press, 1990.
- [26] Ouchi, W. G. "Markets, bureaucracies, and clans," *Administrative Science Quarterly*, 1980, 25, 129-141.
- [27] Patton, M. Q. *How to use qualitative methods in evaluation*, Newbury Park, CA: Sage, 1987.
- [28] Powell, W. W. "Neither market nor hierarchy: Network forms of organization," In B. W. Staw and L. L. Cummings (eds.), *Research in Organizational Behavior*, 12, 295-336. Greenwich, CT: JAI Press, 1990.
- [29] Scott, W. R. "The evolution of organization theory," In *Studies in organizational sociology: Essays in honor of Charles K. Warriner*, edited by Gale Miller. Greenwich, CT: JAI, 1991, 53-68.
- [30] Scott, W. R. "The organization of environments: Network, cultural, and historical elements," In *Organizational environments: Ritual and rationality*, Meyer, J. W. and Scott, W. R. Updated Edition, Beverly Hills, CA: Sage, 1992, 155-175.
- [31] Scott, W. R. *Institutions and organizations*, London, CA: Sage, 1995.
- [32] Tolbert, P. S. "Resource dependence and institutional environments: Sources of administrative structure in institutions of higher education," *Administrative Science Quarterly*, 1985, 30: 1-13.
- [33] Tolbert, P. S., and Zucker, L. G. "Institutional sources of change in the femoral structure of organizations: The diffusion of civil service reform, 1880-1935," *Administrative Science Quarterly*, 1983, 28, 22-39.
- [34] Watson, R. T., Akselsen, S., and Pitt, L. F. "Attractors: Building mountains in the flat landscape of the world wide web," *California Management Review*, 1998, Winter, 40(2), 36-56.
- [35] Williamson, O. E. *The economic institutions of capitalism*, 1985, New York: The Free Press.
- [36] Wise, R. and Morrison, D. "Beyond the exchange: The future of B2B," *Harvard Business Review*, 2000, November-December, 86-96.
- [37] Yin, R. K. *Case study research: Design and methods*, 2nd Ed., London, CA: Sage, 1994.
- [38] Zucker, L. G. "Institutional theories of organizations," *Annual Review of Sociology*, 13, 443-464, 1987.