The Development of the Software Industry Agglomeration in Seattle : Influencing Factors and Policy Effects[1)]

Hiroyuki Yamagata [)]

. Introduction

The purpose of this paper is to analyze agglomeration factors of the software industry in Seattle, Washington, and to empirically evaluate the effect of relevant policies on the industry, through a case study. This study makes it possible to critically clarify the real contributions and limitations of the creative class studies. In order to understand the evolution of policies and the resultant of the transformation the city of Seattle, the following aspects are surveyed and discussed : development of urban planning policy and space, characteristics of the art & culture policy, and artistic preferences of software engineers in Seattle. These have not yet been fully investigated in major previous literature related to agglomeration and the creative class [).]

After the 1970s, the proportion of employees by industry changed sharply in U. S [).] The ratio of manufacturing industry employees had fallen, and that of service industry employees had risen because of globalization and advanced industrial struc-

) Manuels Castells, *The Informational City,* (New York : Basil Blackwell, 1989) ; Richard Florida, *Cities and the Creative Class,* (London : Routledge, 2004) ; Ann Markusen, "Organizational Complexity in the Regional Cultural Economy," *Regional Studies* 44 (July 2010), 813 828 ; Enrico Moretti, *New Geography of Jobs,* (Boston : Houghton Mifflin Harcourt, 2012).

) Peter Drucker, *Post Capitalist Society,* (New York : Collins Publishers, 1993) ; Robert Reich, *The Work of Nations : Preparing Ourselves for 21st Century Capitalism,* (New York : Alfred Knopf, 1991).

ture. The force of the service industry has been decomposed into the high wages occupations and low wages occupations. This is because creativity and innovations are important in corporate management and R & D activity for high technology service industries such as the software industry. Specific abilities are required in innovation activities. Innovative companies have recruited an excellent talented workforce for competitive advantage. Successful high technology companies can make high profits by their intellectual property rights and increasing revenue from the global market. As a result, the earnings level of such a workforce has risen in the past few decades).

In this context, creative class literatures appeared). The creative class is defined as people who earn their income by using their own creative capabilities). The creative labor forces are included mainly in the high wage bracket. It also implies that the creative class workforce is interested in creative milieu such as art activities and high technology industry agglomerations in particular cities. The creative class discourse also interacted with regional science and has expanded its realm to urban studies). This is because creative activities are generally restricted to particular places.

After the 1970s, American cities also have been diverging into two main parts). Some cities are based on innovation, design, R & D, and other creative economic activities, and are increasing their employment and income. Other cities that are based on old manufacturing are losing employments and income. After the 1990s, Seattle has joined the former group. According to Florida (2002), Seattle is ranked among the top 10 locations that accommodate the cultural, creative, and technological workers. In this regards, Seattle can be considered as one of the most creative cities in the U.S.

However, a further empirical study is needed. For example, Florida (2002) undertook comparison, ranking and pointing out the importance of the art & culture activities based on various indicators. However, he did not necessarily aim at the

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) *Ibid* ; Charles Murray, *Coming Apart : The State of White America, 1960 2010,* (New York : Cox and Murray Inc., 2012).

) Richard Florida, *The Rise of the Creative Class Revisited : Revised and Expanded,* (New York : Basic Books, 2014) ; Richard Florida, *The Flight of the Creative Class : The New Global Competition for Talent,* (New York : Harper Business, 2005).

) *Ibid.*

) *Ibid.*

) Moretti, *op. cit.,* (2012).

empirical study of urban industries[10]. Florida (2002) and (2005) also point out the decisive importance of the art & culture, and urban planning policies to attract the creative industry into the city. However, he does not fully discuss how the policies actually contribute to the accumulation of the creative industry[11].

This paper discusses the agglomeration theory from a broader perspective. The main previous agglomeration studies have taken the element approach, which detects the most important factors such as inter firm networks between establishments[12]. However, in the contemporary age, human capital factors, venture capitals, angel investments, and research and educational institutes could affect the formation of an agglomeration. Moreover, in the contemporary city, the art & culture and the urban planning policies are key elements of the city government's policies, and they would play a greater role in urban industries' development. It is important empirically to clarify the real contributions of these factors and policies to the agglomeration process, without overestimating them.

The following points are examined : First, the paper presents the overall characteristics of Seattle's industries as well as the dynamics of its software industry. Second, it examines the agglomeration factors of the software industry in Seattle through a questionnaire survey and interviews. In this section, two aspects are analyzed in particular : 1) foundation factors that reflect the initial conditions of the agglomeration formation ; and 2) factors in which corporate operations are continued, that is, agglomeration is maintained. The examination of these factors is not limited to the network between the establishments in the agglomeration. It extends to human resources, the city's environment and attractiveness, venture capital and angel investment, relations with research and educational institutes, etc. Third, this paper presents the development and influence of Seattle's urban planning and art & culture policies on the agglomeration of the software industry. It also surveys the development of the central downtown area, and the artistic preferences of software engineers.

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10) Richard Florida, *op. cit.*, (2005) ; Richard Florida, *op. cit.*, (2014).

11) *Ibid.*

12) Sebastiano Brusco, "The Emiliano Model : Productive Decentralization and Social Integration," *Cambridge Journal of Economics* 6 (November 1982), 167 184 ; Edward Malecki, "Industrial Location and in High Technology Industries," *Economic Geography* 61 (July 1986), 345 369 ; Bruno Moriset, "The New Economy in the City : Emergence and Location Factors of Internet based Companies in the Metropolitan Area of Lyon, France," *Urban Studies* 40 (October 2003), 2165 2186.

This paper is based on the statistics and reports by the state and municipal governments ; an original questionnaire survey sent to software companies in 2013 and 2014 (53 responses out of 510 questionnaires distributed ; effective return rate of 10.4%) ; interviews with staff members from various companies and regional business organizations, held from 2002 to 2014 ; and interviews with staff members from the state and municipal government of Seattle undertaken from 2009 to 2014.

The original mail survey was undertaken as follows[13]. In April 2013 and August 2014, questionnaires were sent to the companies that I could confirm as developing any software product, and listed by the Washington Technology Industry Association (WTIA regional business organization of technological firms) and the Washington Interactive Media Network (WIN regional business supporting non profit organization). I requested these establishments to provide data as available in March 2013.

The sample bias is as follows. The primary samples comprise companies related to software package development (including game software development), custom software development, data processing, and other information services. Although they were established from the 1970s to the 2010s, approximately 40% of the samples were founded after the 2000s. While the proportion of small sized establishments (having four workers or less) was rather small, that of mid sized establishments (10 to 24 workers) was relatively large. In addition, the individual and head offices accounted for 90% of the samples, while the branch and foreign company offices accounted for less than 10%. Although the samples are related to software development, any company whose main business is to provide information services to other establishments is also included.

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13) Since the response rate of mail survey to U. S. IT companies is almost very low (5% or less), most research on Silicon Valley such as that by Chong Moon Lee et al. (2000) is shifted to the interview survey. However, two researches of Seattle IT companies published in the 1990s and the 2000s are based on mail surveys and have a return rate over 10%. Therefore, this paper conducted an additional mail survey, and visited offices to request cooperation with this study in August and September 2014. Total effective response rate is 10.4 % (53 effective responses). Refer to Chong Moon Lee, William F. Miller, Marguerite Gong Hancock, Henry S. Rowen, *The Silicon Valley Edge : A Habitat for Innovation and Entrepreneurship,* (Redwood City : Stanford University Press, 2000) ; Peter Haug, "Regional Formation of High Technology Service Industries : the software industry in Washington State, "*Environment and Planning A* 23 (June 1991), 869 884 ; Heike Mayer, "Entrepreneurship in a Hub and Spoke Industrial District : Firm Survey Evidence from Seattle's Technology Industry," *Regional Studies* 47 (October 2013), 1715 1733.

All the results are compared with the survey that the author conducted in 2002 and 2003[14]. Finally, in this paper, "Seattle" represents the entire Seattle primary metropolitan statistical area set by the census in 1980.

Ⅱ. Dynamics of Industries, including the software Industry in Seattle

(1) Historical Development of Seattle's Industries

In the second half of the 20th century, Seattle changed from a port town to the aerospace industry city. **Table 1** shows the composition of Seattle industries and its dynamics after the 1960s. Seattle was primary known as a port town and traffic hub in the Pacific Northwest[15]. World War II triggered the increasing influence of aerospace industry as the headquarters location city of the Boeing Company[16]. Although there were only 86 business establishments in Seattle in 1990, the number of workers was 111,900 (11.4% of the total workers) due to the large Boeing factories[17]. However, Boeing globalized its production systems in response to the end of the Cold War and increasing competition in the commercial aircraft industry after the 1990s. Therefore the number of aerospace industry workers decreased and was 82,000 in 2000 and 85,200 in 2010[18].

Conversely, the service industry, particularly the information service sector, has grown rapidly in Seattle after the 1990s. In 2000, the number of establishments increased to 44,016 (54.9% of the total of establishments) while the number of workers

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14) Refer to Hiroyuki Yamagata, "The Agglomeration Factors and Composition of Linkages of Small Middle Size Software Companies in Seattle: An Analysis of Author's Survey Conducted in 2002 and 2003," *Journal of Political Economy and Economic History*, Vol. 192 (June 2006), 30 45; Hiroyuki Yamagata, "Location Conditions and Market Regions of Software Companies in Seattle MSA," *Annals of the Japan Association of Economic Geographers*, Vol. 53 (September 2007), 282 297.

15) Roger Sale, *Seattle Past to Present*, (Seattle: University of Washington Press, 1972); Richard Berner, *Seattle 1900 1920: From Boomtown, Urban Turbulence, to Restoration*, (Philadelphia: Charles Press, 1991).

16) Richard Berner, *Seattle Transformed: World War II to Cold War*, (Philadelphia: Charles Press, 1999).

17) Calculation based on *County Business Patterns 1990*, (Washington DC: USGPO, 1992); Washington State Department of Labor, *Labor Area Summary April 1990*, (Olympia: Washington State Department of Labor, 1990).

18) Hiroyuki Yamagata, *High tech Sangyo Toshi Seattle no Kiseki* [The Development Process of High tech Industrial City Seattle], (Kyoto: Mineruba Shobo, 2010), 111 134.

Table 1 Composition of industries of Seattle in establishmen and employment (1960 2010)

Sectors	number of establisiment						distribution ( )						location quotient
	1960	1970	1980	1990	2000	2010	1960	1970	1980	1990	2000	2010	2010
Agriculture, forestry, fishing and hunting	282	387	603	1,111	406	378	1.3	1.6	1.5	1.8	0.5	0.5	1.57
Mining, quarrying, and oil and gas extraction	30	29	11	57	51	36	0.1	0.1	0.1	0.1	0.1	0.1	0.11
Construction	2,260	2,396	4,062	6,977	8,659	8,140	10.1	9.7	10.4	11.2	11.5	10.2	1.10
Manufacturing	1,805	1,871	2,621	3,811	3,870	3,049	8.1	7.5	6.7	6.1	5.2	3.8	0.93
(Aerospace)	16	31	52	86	106	70	0.1	0.1	0.1	0.1	0.1	0.1	4.37
Utilities, Transportation and warehousing	659	773	1,294	2,105	1,612	1,858	3	3.1	3.3	3.4	2.1	2.3	0.72
Wholesale trade	2,316	2,527	3,643	5,398	5,543	4,966	10.4	10.2	9.4	8.7	7.4	6.2	1.11
Retail trade	6,130	6,256	8,671	12,592	9,158	8,826	27.5	25.2	22.3	20.3	12.2	11	0.76
Finance, insurance and Real estate	2,154	2,745	4,300	6,095	8,290	9,339	9.6	11.1	11.1	9.8	11	11.6	1.05
Services	6,040	7,905	11,428	20,727	35,223	44,016	27.1	31.9	29.4	33.4	46.9	54.9	1.06
(Information related)			158	571	1,656	2,506	NA	NA	0.4	0.9	2.2	3.1	1.60
Others	636	357	2,235	3,189	2,314	204	2.8	1.4	5.7	5.1	3.1	0.3	0.85
Total for all sectors	22,328	24,805	38,908	62,065	75,126	80,182	100	100	100	100	100	100	1.00

Sectors	number of employment (include self employment)						distribution ( )						location quotient
	1960	1970	1980	1990	2000	2010	1960	1970	1980	1990	2000	2010	2010
Agriculture, forestry, fishing and hunting	994	2,040	3,043	8,910	3,174	2,491	0.3	0.5	0.5	0.9	0.3	0.2	2.06
Mining, quarrying, and oil and gas extraction	373	265	946	869	445	677	0.1	0.1	0.1	0.1	0	0.1	0.11
Construction	17,852	25,352	46,531	67,130	81,679	65,230	5.7	5.9	6.9	6.8	6.6	5.4	1.12
Manufacturing	125,115	137,924	178,665	227,281	191,582	118,119	40.3	31.9	26.5	23.1	15.5	9.7	1.00
(Aerospace)	60,531	68,051	71,154	111,900	85,200	82,000	19.5	15.7	10.5	11.4	6.9	6.8	19.90
Utilities, Transportation and warehousing	21,816	35,337	50,698	67,938	67,804	60,809	7	8.2	7.5	6.9	5.5	5	1.21
Wholesale trade	29,193	35,039	51,085	74,029	73,725	64,633	9.4	8.1	7.6	7.5	6	5.3	1.07
Retail trade	51,937	81,376	133,635	186,506	142,408	127,862	16.7	18.8	19.8	18.9	11.5	10.5	0.81
Finance, insurance and Real estate	19,741	35,353	57,401	79,584	89,764	75,887	6.4	8.2	8.5	8.1	7.3	6.3	0.89
Services	41,321	78,679	147,544	268,751	572,148	696,173	13.3	18.2	21.9	27.3	46.2	57.4	1.03
(Information related)			7,902	9,880	45,431	84,900	NA	NA	1.2	1.0	3.7	7.0	8.87
Others	2,400	1,495	5,521	3,442	14,870	264	0.8	0.3	0.8	0.3	1.2	0	0.07
Total for all sectors	310,742	432,860	675,069	984,440	1,237,599	1,212,145	100	100	100	100	100	100	1.00

Notes 1) "Agriculture, forestry, fishing and hunting" does not include agriculturural workers.

Notes 2) "Aerospace" is the inner number of the manufacturing. Aerospace is amount of aircraft and parts, and spacecraft and guided missile.

Notes 3) The employment number of aerospace and information related industry (2010) is surpressed at County Business Patterns. Therefore, this table is based on the Labor Area Summary of Washington State. However Labor Area Summary has restrictions 100 person unit.

Notes 4) The taxonomy of each sector after 2000 are changed sharply 1990 or before. I rearranged data after 2000 so that these data could be compared with before 1990. However, there is a limit in comparing the data in 2000 and afterwards strictly and directly with the before data, since service industry is expressed excessively and wholesale and retail trade are expressed too little.

Notes 5) "Information related" means "packaged software + custom software+data processing + computer system desgin+other computer services."

Notes 6) By a definition of the Bureau of the Census, Department of Commerce, location quotient (LQ) is an analytical statistic that measures a region's industrial specialization relative to a larger geographic unit. In this paper I compare Seattle with the US.

Source) U. S Department of Commerce (annually) Bureau of The Census, *County Business Patterns*, U. S. GPO.

increased to 696,173 (57.4% of the total workers). The service industry comprises various industries including services for establishments, consumers, and society. Table 1 shows that the information industry has increased rapidly compared to other service sectors. The number of information industry establishments increased from 571 in 1990 to 2,506 in 2010, and the number of related workers increased from 9,890 in 1990 to 84,900 in 2010, which exceeded the number of workers in the aerospace industry.

(2) Characteristics of Seattle's Information Industry and its Position

Characteristic of the information industry in Seattle is a large existence of package and custom software companies. The information industry includes companies providing packaged software, custom software, information processing, and other computer services[19]. Table 2 shows the location quotients of establishments and workers in each industry. According to this table, the location quotients of packaged software (number of establishments : 2.79 ; the number of people employed : 10.30) and custom software (number of establishments : 1.44 ; the number of people employed : 1.55) are high[20]. Therefore, the following focuses especially on the software industry, i.e., packaged software and custom software.

Table 2 Characteristics of the software industry in Seattle

Sector (SIC 2digit)	number of establishment	location quotient	number of employment (include self employment)	location quotient
Packaged software	279	2.79	49,343	10.30
Custom software	1,019	1.44	11,616	1.55
data processing	238	1.47	6,653	1.33
computer system desgin	655	1.03	6,621	1.06
other computer services	293	1.81	2,012	0.89
total	97,293	1.00	1,481,865	1.00

Source) U. S. Department of Commerce, Bureau of the Census(2012), *County Business Patterns 2010*.

19) U. S. Department of Commerce, *the Emerging Digital Economy 2003*, (Washington DC : US Department of Commerce, 2003), 19 34.

20) Based on the definition by the U. S. Census Bureau, and U. S. Department of Commerce, location quotient (LQ) is an analytical statistic that measures a region's industrial specialization relative to a larger geographic unit. In this paper, the author compared Seattle with the U. S. (US Department of Commerce, BEA webpage (http://bea.gov/faq/index.cfm?faq_id =478&searchQuery=&start=0&cat_id=5), as of May 5, 2014.)

Seattle is ranked high in terms of per capita accumulation (of software industry establishments) in the U. S. According to **Table 3**, Seattle was ranked eighth in terms of the number of software industry establishments per capita and second in terms of the number of workers in the software industry per capita in 2010. Although Seattle received a lower rank in the former category, it is in the third group along with San Francisco, Austin, and Boston. These cities are preceded by San Jose (Silicon Valley) and Washington, D. C. Regarding the number of workers in the industry per capita,

Table 3 US top 20 metropolitan statistical areas in the number of establishment and employment of software industry per population

Metropolitan Statistical Areas	Ranking of the number of establishment per population	Ranking of the number of employment per population	Number of population
San Jose (Silicon Valley)	1	1	1,836,911
Washington DC	2	4	5,636,232
San Francisco	3	3	4,335,391
Austin	4	6	1,716,289
Boston	5	5	4,552,402
Minneapolis	6	11	3,348,859
Denver	7	13	2,543,482
Seattle	**8**	**2**	**3,439,809**
San Diego	9	8	3,095,313
Portland	10	9	2,226,009
Atlanta	11	7	5,286,728
New York	12	14	19,567,410
Philadelphia	13	12	5,965,343
Dallas	14	10	6,426,214
Los Angels	15	17	12,828,837
Chicago	16	15	9,461,105
Miami	17	20	5,564,635
Detroit	18	16	4,296,250
Phoenix	19	19	4,192,887
Huston	20	18	5,920,416

Note) Software industry means software publishing and custom software of the North America industrial classification in 1997.
Source) U. S. Dept. of Commerce, Bureau of the census, *County Business Patterns 2010;* U. S. Bureau of the census, *Census of Polulation and Housing 2010.*

Seattle is in the second group following San Jose (Silicon Valley). This is because the headquarters of Microsoft and other large companies as well as their R & D centers are based in Seattle.

Although the questionnaire used in this study cannot be compared with other studies directly, some comparison is possible to an extent. According to several previous studies, the following aspects can be understood regarding the characteristics of the software industry agglomeration in Seattle[21].

First, the main characteristics of Seattle's software companies are the survivors in the private market from the early stages. The companies in Seattle have a weak tendency to depend on Department of Defense programs or Federal Government SBIR (The Small Business Innovation Research) programs from the start up stage compared with Silicon Valley, Washington, D. C., Boston, Houston, etc.

Second, Microsoft's influence is relatively strong. This is similar to the situation in Austin, where a large software company called Tivoli Systems, a spin off from IBM, is the source of the accumulation of software companies.

However, the idea that Seattle is a "Microsoft center type industrial agglomeration" is not necessarily a correct understanding. This is because approximately 80% of the total companies in Seattle are not spin offs from Microsoft, and have no direct relations with it. Other software and IT companies such as Adobe, Amazon, Google, and Oracle also have R & D offices in Seattle. According to this author's previous survey, only around 20% software establishments are closely related to Microsoft. Table 2 shows that the number of software industry establishments was 1,298 in 2010, and according to Table 1, the number of establishments that conducted software development was approximately 2,500, provided their main business include data processing or other computer services. Therefore, this paper surveys and discusses the characteristics of these independent companies.

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21) Michi Fukusima, *High tech Cluster no Keisei To Local Initiative* [The Formation of a High Tech Cluster and Local Initiative : How Has Austin Grown into a High Tech City?], (Sendai : Tohoku University Press, 2013) ; Heike Mayer, *op. cit.*, (October 2013) ; Enrico Moretti, *op. cit.* (2012) ; Sofia Ayala, Elsie Echeverri Carroll, "Economic Growth and Linkage with Silicon Valley : The Cases of Austin and Boston," *Texas Business Review*, (December 2004) ; USPTO, *United States Patent Grants*, (Washington, D. C. : USPTO, annually).

. Formation and Development of Software Industry Agglomeration in Seattle

(1) Perspective for Analyzing Software Industry Agglomeration Factors

In order to survey the agglomeration process fully, analysis of the initial and continuation conditions is indispensable. In other words, it is necessary to investigate not only why the companies were founded in Seattle (initial conditions) but also why corporate management is being continued in there (continuation conditions)[22]. Considering these two steps, it is possible to examine important factors from the perspective of continuing agglomeration as well as that of initial location. For this reason, Tables 4 and 5 were created.

The calculation method for the importance index used in the two tables is as follows : The respondents were requested to rate multiple factors (maximum of three). For example, when a factor was deemed "decisive important," the respondents marked "1" and if they felt that it was "to some extent important," they marked "0.5." The total points of each factor were divided by the number of samples. Therefore, each in-

Table 4　Founding reason of software company in Seattle

Important reason	Importance index
Founders has lived in Seattle	**0.60**
Available of scientists, engineers, and creative talents	**0.44**
Attractive natural environment	0.25
Good culture and entertainment environment	0.24
Proximity to customers (except Microsoft)	0.12
Availability of investment from Venture Capitals　and Angels	0.10
Proximity to Microsoft	0.09
Labor cost and life costs are reasonable	0.08
Proximity to research and educational facilities	0.07
Tax system of the state or municipal governments	0.03

Notes 1) Requesting mark 1 if "desicive important" and mark 0.5 if "to some extent important"
Notes 2) Requesting to answer max 3 reasons.
Source) Author's mail survey conducted in 2013 and 2014.

22) Refer to Takayuki Itami, Shigeru Matsushima, and Takero Kikkawa, *Sangyo shuseki no Honshitsu* [The Essence of Industry Agglomeration], (Tokyo : Yuhikaku, 1998).

dex shows the importance of each factor with respect to the entire samples.

(2) Reasons to Establish Companies in Seattle (Initial Factors)

The survey of initial location factors suggests that human capital and factors that reinforce them are important in the software industry. Table 4 shows the factors that possibly influenced the founders of software companies at the time of establishment. According to this table, "Founder has lived in Seattle" (0.64) and "Availability of scientists, engineers, and creative talent (0.55)" are especially important factors. Based on the aforementioned index of importance, if all the respondents selected "to some extent important," then the index would be 0.5. Since these two factors are greater than 0.5, it shows that companies judged these factors as "decisively import ant." In addition, "Attractive natural environment" (0.25), and "Good culture and entertainment environment" (0.24) are recognized as second most important. Although these two factors are not as decisive as the earlier reasons, the companies that recognize them as "to some extent important" consist of approximately half the samples.

The third most important factors include : "Proximity to customers (except Microsoft)" (0.12), "Availability of investment from venture capitals (VC) and angel investors (AG)" (0.10), "Proximity to Microsoft" (0.09), and finally "Labor cost and life costs are reasonable" (0.08).

The following factors are recognized by some companies as "to some extent important" : "Proximity to research and educational facilities" (0.07) and "Tax system of the state or municipal governments" (0.03).

At this point, I will discuss the data for the above mentioned initial location conditions by considering the information obtained from interviews.

First, "Lived in Seattle at the time of foundation" is the most important reason since half of the founders interviewed were born in Seattle. The remaining half came to Seattle to either study or find employment[23]. In addition, they appreciated the physical environment of Seattle, enjoying a high quality life style[24], and considered as a location where they could obtain founder's profits by initial public offerings since Washington State hardly imposes a personal income tax[25]. The state tax system was extremely attractive to the founders. Further, Seattle is one of the safest and most

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23) Interview with a founder of Company "BR" on September 8, 2013.
24) Interview with a founder of Company "WR" on July 29, 2003.
25) Interview with an executive officer of Company "ZA" on September 23, 2002.

beautiful cities in the country[26]. These can be interpreted as the founders' personal preferences.

Second, "Availability of scientists, engineers, and creative talents" is also an important factor. However, according to this author's previous survey, "Attractive natural environment" was more important than the previous factor[27]. **Table 4** suggests that the founders believed it was easier to hire skillful and talented people in 2013.

Third, although "Attractive natural environment" is the third most important factor, "Good culture and entertainment environment" is almost equivalent in importance, which actually increased based on its author's previous investigation[28]. The increase in the latter factor and the lesser importance of the former suggests that the attractiveness of Seattle as a foundation location developed based on cultural and entertainment aspects.

Fourth, the investment from VCs and AGs is not a strong reason for foundation. This author's mail survey confirms that roughly 20% of the samples received funds from VCs and AGs. However, since software companies can be established even if they do not have large initial funds, it may be recognized as a minor reason for foundation.

Fifth, **Table 4** does not show the importance of the following factors : "Proximity to a customer (except Microsoft)," "Labor and life costs are reasonable," "Proximity to Microsoft," "Tax system of the state and municipal government", and "Proximity to research and educational institutes." However, the importance of "Proximity to customers (except Microsoft)" increased compared to this author's previous survey. This is because approximately 25% of the samples are software companies whose main business is providing information services to other establishments. This factor has been judged as "to some extent important." The type of main business reflected the result clearly. "Proximity to Microsoft" is recognized as a minor factor. "Proximity to research and educational institutes" is not considered important. Although "Tax system of the state and municipal governments" is not considered important, it still needs consideration according to the founders' personal preferences, as mentioned above.

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26) University of Suffolk, Bacon Hill Institute webpage (http://www.beaconhill.org/Com petitivenessHomePage.html), as of June 12, 2008.

27) Yamagata, *op. cit.*, (2007).

28) *Ibid.*

(3) Factors that Influence Companies' Continued Operations in Seattle

The survey of continual location factors also suggests that human capital and factors that enforce them are important. Table 5 shows the reasons why companies continue their operations in Seattle, that is, important factors causing them to remain in Seattle. According to Table 5, the most important factor is "Availability of scientists, engineers, and creative talent" (0.64). This is followed by "Proximity to customers (except Microsoft)" (0.26), "Good cultural and entertainment environment" (0.24), "Attractive natural environment" (0.21), "Proximity to research and educational institutes (0.11), and "Investment from VCs and AGs" (0.10), "Proximity to Microsoft" (0.07), and "Tax system of the state and municipal governments" (0.06) not considered as important as the other factors.

At this point, I will discuss the data for the above mentioned continuing location conditions based on the information obtained from interviews.

First, half of the samples recognized "Availability of scientists, engineers, and creative talents" as "decisively important." The majority of the other companies judged it as "to some extent important." According to the interviews, it is clear that hiring talented workers who are good at original software developments is of utmost importance. The features of talented workers in Seattle include being excellent scientists, and for engineers, being good at software development and computer science[29].

Table 5 Reasons for contiuing company's operation in Seattle

Important reason	Importance index
Available of scientists, engineers, and creative talents	**0.64**
Proximity to customers (except Microsoft)	0.26
Good culture and entertainment environment	0.24
Attractive natural environment	0.21
Proximity to research and educational facilities	0.11
Availability of investment from Venture Capitals and Angels	0.10
Proximity to Microsoft	0.07
Tax system of the state or municipal governments	0.06

Notes 1) Requesting mark 1 if "desicive important" and mark 0.5 if "to some extent important"
Notes 2) Requesting to answer max 3 reasons.
source) Author's mail survey conducted in 2013 and 2014.

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29) Interview with a Vice President of Company "SM" on December 9, 2002, questionnaires

Designers are to some extent, excellent, whereas marketing and management consultants are not[30].

Second, "Proximity to customers (except Microsoft)" is considered second most important. This is because roughly 30% of the samples selected "decisively important" or "to some extent important." According to the interviews, majority of the companies' customers are in Washington and Oregon, although some are based in distant cities, such as Washington, D. C., and the Silicon Valley[31]. Software companies often provide information services before developing original software. Many of the customers are IT industry companies[32]. These findings suggest that information related industries have grown in Seattle, and this is an advantageous because these companies can survive by offering informational services to regional customers.

Third, "Good culture and entertainment environment" and "Attractive natural environment" have reversed the previous rankings. Scientists, engineers, and creative talents are interested in both these factors because they prefer cities where they can enjoy a high quality life style. In other words, these factors support the condition of "Availability of scientists, engineers, and creative talents." This suggests that the recent cultural and entertainment conditions of Seattle have become more important than its natural environment and their related life style. They were not considered important in the past. Thus, the following section focuses on Seattle's urban planning, and art & culture policy.

Fourth, approximately 20% of the samples felt that "Proximity to research and educational institutes" and "Investment from VCs and AGs" are "to some extent important." Although these conditions cannot be considered "decisively important," they are of secondary importance. According to the mail survey, eleven samples received investments from VCs and/or AGs. Nine samples cooperated with research and educational institutes through joint ventures and educational programs.

Fifth, the index of "Proximity to Microsoft" is very low. Only four samples felt that this factor was "decisively important." This suggests that the direct influence of

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returned from a Director of international operations of Company "BF," and a founder of Company "UI" in October 2013.

30) Interview with a Director of international operations of Company "BF" on September 11, 2013.

31) The same interview of as in notes 23 and notes 25.

32) Interview with a founder of Company "SM" on December 09, 2002.

Microsoft on other companies' managements is limited[33]. In addition, this result shows that the direct influence of Microsoft on Seattle's software industry agglomeration is restricted unlike general recognition.

Sixth, "Tax systems of the state and municipal government are rarely considered important. According to the interviews, the tax systems of Washington State and municipal governments are not advantageous to the company's management. They have imposed a slightly heavy tax burden on R & D activities[34]. However, according to the analysis in **Table 4**, the tax system of Washington State was attractive to founders. The influence of the tax system on the formation of the software industry agglomeration from founders' perspective should be considered.

. Effect of Seattle's Urban Planning Policy and Art & Culture Policy on Software Industry Agglomeration

(1) Increase of Human Capital Related to the Software Industry

This section examines the situation of human capital in the software industry, the urban planning policy, and the art & culture policy in Seattle. This is because human capital is important in the agglomeration process. Outstanding urban planning and art & culture policies can also attract excellent human capital and reinforce the software industry agglomeration. These have been suggested in the previous section.

The U. S. software industry is located in the center of the international division of labor. To survive in the competitive global markets, core R & D has been conducted in advanced countries, such as the U. S., Japan, and the Great Britain. Verification of operations, application technologies R & D and services has been performed in emerging countries, such as India[35].

Although most of the workforce in the software industry is well remunerated, they are however still insecure. U. S. software companies require highly skilled scientists and engineers having expertise in software technologies to set de facto standards, conduct R & D activities, and develop advanced software. The competition to acquire

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33) According to the interviews, many software company staff members realize that Microsoft has a certain influence on the Seattle software industry through spin offs and attraction of excellent software related talents. However, direct linkages, such as customer supplier relations, are extremely limited.

34) The same interview as in notes 25.

35) Keiji Natsume, *America IT Takokuseki kigyou No Keiei Shenryaku* [Management Strategy of US IT Multinational Companies], (Kyoto ; Mineruva shobo, 1999.)

such skilled human capital is extremely intense, and wages for such occupations have increased and been kept constantly high. However, these workers are not generally considered long term employees. They are frequently laid off or fired due to technical changes or offshoring[36].

The number of software development related workers in Seattle was 76,100 in 2000 (5.5% of the total number of workers in Seattle), and 106,790 in 2010 (7.6% of the total number of workers)[37]. This data shows that the number of highly skilled people related to the software industry in the total labor force has increased. In addition,

Table 6 Avarage annual salary of each occupation in Seattle

Occupation	Number of workers	Avarage annual salary ($)
Computer and Information Research Scientists	350	106,410
Software Developers (Systems Software)	13,670	106,090
Software Developers (Applications)	35,650	101,910
Computer Network Architects	3,500	101,760
Computer Systems Analysts	10,540	98,980
Information Security Analysts	1,930	96,550
Computer Programmers	11,020	95,960
Database Administrators	2,160	90,340
Computer Occupations (All Other)	4,080	88,500
Network and Computer Systems Administrators	5,220	80,780
Web Developers	3,390	76,580
Computer Network Support Specialists	2,710	70,390
Computer User Support Specialists	9,620	56,640
Computer and Mathematical Occupations (*Avarage*)	*106,790*	*93,510*
All Occupations (avarage)	1,409,500	57,560

Source) BLS, *May 2012 Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates Seattle Bellevue Everett, WA Metropolitan Division*, at http://www.bls.gov/oes/current/oes_42644.htm# 00-0000 as of March 05, 2014.

36) Hiroyui Yamagata, "Report on U. S. Industrial Dynamics : From Aerospace Industry to Software Industry Industrial Diversification and Transformation in the Labor Market in the Seattle Metropolitan Area," *Journal of Political Economy and Economic History*, 219, (April 2013), 30 31.

37) Based on data from the U. S. Department of Labor, BLS, *Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates*, http://www.bls.gov/oes/2013/may/oessrcma.htm, (Washington DC : US Department of Labor, BLS, as of September 6, 2013).

Table 6 indicates the annual salaries of software industry occupations in Seattle in 2012. According to this data, the salary levels are higher than the average salary, except for the "user support" occupation.

The number of software development related workers is greater than that of information services related industrial workers in **Table 1**. This is because the software related labor force in Seattle does not work only in the software industry. They are active in other industries as well, such as biotechnology, aerospace, etc[38]. These industries utilize information technology. Moreover, software related workers arrived from different foreign counties, such as India, China, South Korea, Russia, and Eastern Europe. This is the result of software companies, such as Microsoft and other companies offering high level salaries, H1 B visas and green cards. Although Microsoft employed over 40,000 workers in Seattle (as of 2010), approximately were from overseas. Software companies, except for Microsoft, also employ highly skilled engineers from other countries. The growth of foreign born workers in Seattle's software industry has enable internationalization of the residents of Seattle. Although most of these foreign born workers do not necessarily reside in Seattle permanently, some have continued to reside here[39].

(2) Recognition of Software Company Managers of the Urban Planning, and the Art & Culture Policy

Most software company managers are supportive of urban planning, and the art & culture policies in Washington State, especially in Seattle. **Table 7** shows the evaluation of these policies by various software company managers. In each case, the proportion of affirmative answer to the three questions is 70% or more. Specifically, 42 managers answered in the affirmative to the question "Have the urban planning and art & culture policies of Washington State, especially Seattle attracted scientists, engineers, and creative talent?" This shows that a majority of software company managers felt that these policies are attractive to the highly skilled workforce, thereby facilitating the employment of such workers in Seattle. This result supports the analysis of the previous section.

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38) Interview with a Director of the Department of Community, Trade, and Economic Development (CTED) of Washington State on September 10, 2009 and September 09, 2011.

39) Analyzed based on the U. S. Census Bureau, *Census of Population and Housing 1990, 2000, 2010,* (Washington DC ; US GPO, November 1992, 2002, 2012).

Table 7 Recognition of the software companies managers to the urban policy
and the art & culture policy

Question	Yes	No	NA
Do you think the urban policies have created good living conditions and quality of life in Washington State or the greater Seattle area?	**40**	8	5
Do you think the art and cultural policies in Washington State or the greater Seattle area have created attractive lifestyle?	**41**	9	3
Do you think the urban policies and the art & cultural policies in Washington State or the greater Seattle area have attracted skillful people (scientist, engineer, creative talent etc.)?	42	9	2

Source) Author's mail survey conducted in 2013 and 2014.

(3) Evolution of Growth Management Policy, and the Art & Culture Policy

(a) Evolution of Growth Management Policy and Change of the Central Downtown Area

The growth management policy of Seattle urged that software company accumulation has changed the urban space and demographic composition of the central downtown area.

Although the growth management policy of Washington State was formally implemented in 1990, it was not necessarily strictly enforced as compared with other states[40]. However, the city of Seattle strategically managed a growth management policy and an urban planning policy controlled by an active direct democracy and citizens' movement. The city of Seattle developed outside the central downtown area in the 1980s, and controlled its development. As a result, the comparatively compact downtown with a rich natural environment attracted the founders, ant the scientists, engineers who liked the natural environment remained. It acted as one of the initial conditions that result in the software industry accumulation.

In the 1990s, Seattle city tried to encourage agglomeration of high tech industries including the software industry[41]. This is because it became an urgent policy challenge to diversify Seattle's industry base from the aerospace industry after the Cold War. The city of Seattle changed the policies to develop the central downtown area. The land use policy was changed slightly to enable development of residences, offices, commercial complexes, and their mix use. Seattle city also increased the building

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40) The Downtown Urban Center Planning Group, *1985 Downtown Land Use and Transportation Plan*, (Seattle : City of Seattle, 1985).

41) The Downtown Urban Center Planning Group, *The Downtown Urban Center Neighborhood Plan*, (Seattle : City of Seattle, 1999).

Uptown(2000⇒2014)
Detached houses and apartments
⇒Increasing of Condominiums
Increase Middle or Upper Middle Household
Population:1808⇒6980(386.1)
Housing Units total:1548⇒4864(314.2)
Housing Units Owned: 19%⇒21%
Median Household Income: $36,036⇒$55,149(153.0)

South Lake Union and Denny Triangle (2000⇒2014)
Old apartments, Parking lots, and Warehouses⇒Increasing of High-rise, and expensive Condominiums,
Change Land Use code and Height(Redevelopment)
Commercial, Mix use, and Resident
Population:5302⇒10381(195.8)
Housing Units total:3657⇒6986(191.0)
Housing Units Owned: 7%⇒13%
Median Household Income: $24,940⇒$33,851(135.7)

Capitol Hill (2000⇒2014)
Apartments, detached houses, and Condominiums⇒Increasing of them
Population:89 32⇒11983(134.2)
Housing Units total:6610⇒8421(124.7)
Housing Units Owned: 15%⇒18%
Median Household Income: $33,407⇒$45,640(136.6)

Denny Regrade(Belltown) (2000⇒2014)
Old apartments, Parking lots, ⇒Increasing of High-rise, and Expensive apartments and Condominiums, restaurant, and Amenities
Mix use and Resident
Preservation of Affordable Housing
Population:6172⇒10250(166.1)
Housing Units total:4775⇒7380(154.6)
Housing Units Owned: 27%⇒25%
Median Household Income: $34149⇒$58804(172.0)

Commercial Core(2000⇒2014)
Business and retail activities, Civic centers ⇒Increasing of Artistic and Cultural activities, Mix Use(Commercial and Residential)
Population:6352⇒7598(119.6)
Housing Units total:4528⇒4206(92.9)
Housing Units Owned: 19%⇒19%
Median Household Income: $25941⇒$35948(138.6)

First Hill (2000⇒2014)
Apartments, detached houses, and Condominiums⇒Decrease of Apartments, Mix use, and growing of medical complexes
Population:12,371⇒11,337(91.6)
Housing Units total:6610⇒7429(117.8)
Housing Units Owned: 10%⇒14%
Median Household Income: $25,041⇒$33,120(132.3)

Pioneer Square-International District (2000⇒2014)
Old Apartments, Warehouses, Restaurants, and Amenities⇒Increasing of Condominiums, and Cultural activities. Reservation of Ethnic cultures and Affordable Housings
Population:3919⇒5981(152.6)
Housing Units total:2280⇒3402(149.2)
Housing Units Owned: 3%⇒8%
Median Household Income: $14,999⇒$22039(146.9)

Notes 1) Median household incomes of each neighborhood are approximately from 50% to 70% of the average household incomes.
Notes 2) The 2000 data of Uptown is based on the census track. The numbers of population, housing unit are less than neighborhood considerably. It will become approximately 5400 if it calculates on a standard in 2014.
Source: Author's Field Survey, Downtown Seattle Association's data and US Census of Bureau, Census of Population and Housing, various issues, Census of Population, various issues, American Community Survey, various issues, The Downtown Urban Center Planning Group(1985) 1985 Downtown Land Use and Transportation Plan, City of Seattle, The Downtown Urban Center Planning Group(1999) The Downtown Urban Center Neighborhood Plan, City of Seattle, and City of Seattle(2005) DOP, City of Seattle South Lake Union Background and Draft Options for Urban center Plan.
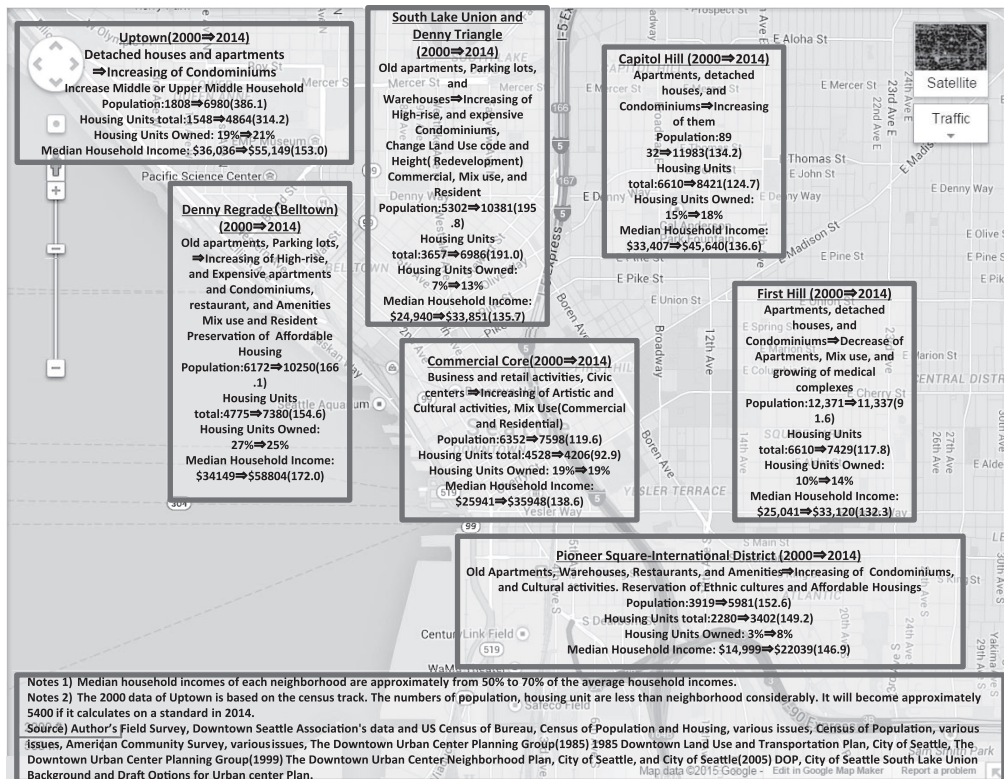
Figure 1 Change of the Downtown Center Neighborhoods

capacity by practical use of floor area ratio bonus, and this attracted companies and residents to the central downtown area[42].

In the 2000s, central downtown development was accelerated. As shown in **Figure 1**, the height regulation for buildings was eased while advancing land use to mix use in neighborhoods such as South Lake Union and Denny Triangle[43]. Development rights were moved from the suburbs especially South Lake Union and Denny Triangle, which were intensive development neighborhoods[44]. These policy changes enabled accelerating construction of high rise apartments and condominiums in almost all neighborhoods.

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42) Downtown Seattle Association and Office of Economic Development of Seattle City, *Strategic Assessment Report : Positioning Downtown Seattle as a Growth Center for Interactive Media and Information Technology*, (Seattle : Community Attribute International, 2011).

43) The Downtown Urban Center Planning Group, *op. cit.* (1999) ; Interview with Deputy Director, DOP, City of Seattle on September 11, 2014.

44) *Ibid* ; and DOP, *City of Seattle, City of Seattle, South Lake Union Background and Draft Options for Urban Center Plan*, (Seattle : City of Seattle, 2005).

　　A series of modifications of the growth management policy mentioned above transformed central downtown rapidly. Revision of the land use, development purpose, population, and the number of housing units for each neighborhood are shown in **Figure 1**. Several apartments and condominiums were constructed to cater to the influx of new residents including young scientists, engineers, and creatively talented people who preferred the downtown area with its prosperity. As presented in **Figure 1**, this phenomenon was concentrated in the three northern neighborhoods of Uptown, Denny Regrade (Belltown), and South Lake Union Denny Triangle.

　　Specifically, South Lake Union and Denny Triangle were redeveloped on a large scale[45]. The city of Seattle constructed a light rail system, office buildings and luxury condominiums were built, high tech companies such as Amazon, and various software and biotechnology companies, commercial establishments, restaurants and high income residents moved in.

　　As a result, the population has increased almost all over the districts in central downtown. The median household incomes also have increased. Newcomer scientists, engineers, and creatively talented residents who earn high salary by their creative activity have moved into the city. The number of resident increased throughout central downtown, and the average family income increased as shown in **Figure 1**. However, it must be noted that the median household income is higher than 30%. This is because the upper level of income was increased mainly after the 2000s. Low income brackets continue to exist.

(b) Evolution and Contribution of the Art & Culture Policy, and the Feature of Art Activities in Seattle

　　The art & culture policy of Seattle and activity of Nonprofit Organizations (NPOs) have together supported artists and artistic activities. Limited mainly to the public art field, local and national prominent artists produced many works in Seattle. New generation software engineers not only love a novel object, but also participate in artistic activities, and are interested in creating digital art.

　　The art & culture policy of Seattle started as one of the industrial diversification strategies for overcoming the "Boeing Bust" in the beginning of the 1970s[46]. The city

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45) City of Seattle, *op. cit.* (2005) ; the same interview as in note 43 ; this author's field survey in 2005, 2011, 2013 and 2014.
46) Interview with the Executive Director and a Director of the Office of Arts & Culture, City

of Seattle considered the important the substantial public space and public art in the central downtown area after the World War II as important.

The city of Seattle established the Office of Arts & Culture in 1971, to increase income from art activities and museums by attracting tourists. IT changed the city planning strategy to support creative industry in the second half of the 1990s. After the 2000s, it raised the position of the art & culture policy in the city planning strategy.

First, the city of Seattle realized that the substantial public art that raised an artistic atmosphere was important to attract creatively talented people. Second, artistic, and cultural economic activities are important because they produced approximately 10,000 jobs and a billion incomes in the 2010s[47]. Public sector offices, such as the city of Seattle and Port of Seattle, also organized enriched art collections, installations, and exhibitions after the 2000s to support the art & culture policy.

Many NPOs that support artists have been formed in Seattle[48]. The city of Seattle has networked with NPOs to enhance the artists' and NPOs' activities by using original revenues and federal government funds. There are approximately 30 or more NPOs that outlay donation actively. For example, The Artist Trust develops networks between artists from across several creating disciplines including paintings, music, theater, sculpture, movie making. This searches the *atelier* and the housing for the artists, and also introducing mentors to the artists. They receive funds from the city government, which is the greatest support for artists in Seattle[49]. The AKI foundation supports events of new casual arts comprising comics, anime, music and dance, martial arts, and performing arts. The 911Media Arts Center focuses on movies, video content creation, and new media art, and supports networking between distributors and creators. Successful software companies, founders, and engineers purchase artist's works either directly or via foundations[50]. For this reason, artists have gathered within Seattle from in and outside the U. S. in the quest for an opportunity to showcase their creative talent.

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of Seattle on September 07, 2011.

47) City of Seattle, the Office of Arts & Culture, Blog of the Office of Arts & Culture, http:// artbeat.seattle.gov/, (Seattle, City of Seattle, as of September 07, 2011).

48) The same Interview as in note 46; Interviews with the founders of NPO "AT" on September 9 and "FT" on September 10 in 2014.

49) The Same Interviews as in note 48.

50) The Same interview as in note 46.

    The following are the artists and the new movements in the public art and urban planning related fields. According to the Office of Arts & Culture of Seattle city, and the author's field survey, they were at least 193 public arts installations in the central downtown area as of 2014[51]. These installations were developed from the 1910s to the 2010s. More than half of the total installations were done after the 1990s when the positive art & culture policy was formulated. The installed works include bronze statues, objects, open spaces, stairs, tiled wall pictures, etc. Furthermore, there are not only Western arts but also ethnic works of the potters such as Akio Takamori. His installations reflect the influence of Japanese culture, being a Japanese resident in Seattle[52]. Artists living in or around Seattle such as the glass carver Dale Chihuly, and natural like objects producer Susan Zoccola created their works in Seattle[53]. In addition to these "local" artists, the artists who later became famous, and worked in New York or Los Angeles, such as Izamu Noguchi and Sarah Sze also initially created their works in Seattle.

    Finally, software engineers' preference and art activities are described. Although there are differences by generations or national origins, it seems that software engineers, in many cases a younger generation, prefer novel and fresh arts. For example, I met young software engineers who like unique objects such as the works of Susan Zoccola, Stuart Keeler, and Michael Machnic, and novel Light Art that made full use of the pipe tube by Leni Schwendinger[54]. Young artists and software engineers in Seattle have joined an NPO called Decibel Mission, and have organized a new generation city festival for performing electronic music, projecting digital images and animations on the streets, making full use of interactive media, multimedia, and electronic music[55]. They are producing an original artistic atmosphere of their interest.

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51) City of Seattle, the Office of Arts & Culture, *Seattle Public Art*, (Seattle, City of Seattle, the Office of Arts & Culture, 2011, 2013, and 2014) ; Interviews with two Directors of the Public Art, Office of Arts & Culture, City of Seattle on September 16, 2014 ; This author's field survey in 2014.

52) This author's field survey in 2014.

53) The Office of Arts & Culture, City of Seattle, *Seattle as Collector*, (Seattle : the Office of Arts & Culture, City of Seattle, 2011) ; Dale Chihuly, *Team Chihuly*, (Seattle : Portland Press, 2007).

54) Interviews with founders and engineers of software companies held on September 8, 10 and 11, 2014.

55) The same interview as in note 48 and 50 ; Decibel Mission, *2014 Festival Corridor*

Ⅵ. Conclusion

This paper analyzed and described the agglomeration factors of the software industry as well as the effect of the urban planning policy, and the art & culture policy in Seattle. The transformation of central downtown's space and demographics, activities of public artists in Seattle, and the artistic preferences of the software workforce were also discussed.

The findings show that at the time of establishment, founders' personal preferences are most important. The findings also show that availability of scientists, engineers, and creative talent is the most important factor in the continuing process. These two factors together constitute human capital factor. Human capital is decisively important to the agglomeration process of the software industry in Seattle. However, in contrast, cultural conditions are not significantly important. Although it is weaker than as insisted by Florida, it is still second most important factor, and supports the human capital.

Therefore, this paper focused on how the city of Seattle strategically formulated an urban planning policy and an art & culture policy to attract highly skilled workers to the area. As of 2010, the human capital related to the software industry in Seattle exceeded 100,000. Thus, this study confirms that the formation of software industry agglomeration as well as policies mentioned earlier has had a mutually positive effect on Seattle. The central downtown area has transformed into a new vibrant urban area, and the income level of the residents has increased. This has resulted in making Seattle one of the successful creative cities of the U. S.

However, this recent transformation of Seattle also has limitations. The increase of high income, software related human capital has created a bias in the upper level income bracket. Due to this process, housing prices have gradually increased, while affordable housing and rental units for low income groups might have decreased. Moreover, to create an attractive and safe downtown area, the city of Seattle might remove any drifters living on the street. As a result, in contrast to the success of Seattle's software industry agglomeration and creative city policies, a serious concern for low income residents could have emerged. Therefore, this author wishes to address

Activation and Engagement, (Seattle : Decibel Mission, 2014. An unpublished internal document).

this "light and darkness" aspect of a successful creative city.