Mapping Historical Maritime Exchanges between Vietnam, Thailand and Japan

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Abstract

This paper focuses on Thai and Vietnamese ceramics from the 15th through 19th century, unearthed from sites in various parts of Japan, and Japanese-made ceramics discovered in the Japanese community of Hoi An in Vietnam. These references will be superimposed with the Ryukyu seafaring trade between Siam and the Ryukyus and the trading activities of the "Shuin-sen" (trading ships licensed by the shogunate) of Japan with Siam, Tonkin, Champa and Annam, in order to verify and consider the Southeast Asian trade in ceramics via maritime routes. For this purpose, a ceramics trade model that can express trading events on a time axis will be proposed, and the analysis and discussion of trends in the ceramics trade will be based on this model. Moreover, a visualization system (called e-TimeMap) has been developed to map and analyze reference materials relating to the ceramics trade. Verification of the GIS functions needed for historical analysis will also be performed.

1. Southeast Asian Ceramics and Maritime Trade Routes

Thai, Vietnamese and other Southeast Asian ceramics unearthed at sites in various parts of Japan have been reported in the Symposium on Southeast Asian Archaeology (JSSAA, 2004). These reports contain detailed archaeological data for articles discovered mainly at sites in Osaka (Sakai), Fukuoka (Hakata), Oita, Nagasaki, Kagoshima and Okinawa. From the type and shape of the ceramic and the patterns on the ceramic, the kiln in the producing region where the ceramic was produced and the period in which it was produced have been estimated. In addition, reference materials discovered in the Japanese community at Hoi An in Vietnam indicate the presence of Chinese ceramics (Kikuchi, 2003). Included in this data are ceramics produced in Hizen in Japan.

Table 1 shows a tabulation of the number of kilns and the ceramics unearthed, obtained from these reports and the results of research. In Table 1, "ruins" refers to the sites at which the items were discovered, divided up by individual country, and "kilns" refers to the kilns used to produce the items, also shown by country. "Others" indicates countries other than Vietnam, Thailand and Japan (in other words, China and other Southeast Asian countries), while "Unknown" indicates items of unknown origin. As Table 1 shows, this study included 1,645 items of data.

In order to determine the nature of trade using maritime routes based on the ceramics data, it is necessary to study the means of trading. With

Table 1: Transportation of ceramics between countries

		Kilns					
		Vietnam	Thailand	Japan	Others	Unknown	Total
Ruins	Vietnam	-	-	70	328	-	398
	Thailand	-	-	-	-	-	-
	Japan	793	367	-	15	72	1247
	Others	-	-	-	-	-	-
	Total	793	367	70	343	72	1645

regard to maritime routes for trade between Southeast Asia and Japan, one should take into account Dutch, Portuguese and other trading ships from East Asia and Western countries. However, this study will be limited to the Ryukyu ships and "Shuin-sen" trading ships described below.

Tributary trade and trade with Southeast Asia on the part of Ryukyu ships are noted in the "Rekidai Hoan." (Okinawan Prefectural Library, 1992). This resource is a collection of diplomatic documents concerning relations between the Ryukyu Kingdom and the Ming and Qing dynasties of China, the Li Dynasty in Korea and Siam and other Southeast Asian countries over a span of 444 years, from 1424 to 1867. The Rekidai Hoan is an invaluable resource for those conducting research into trade at that time between the Ryukyus and East and Southeast Asia.

Let us look at a reference relating to the trade of the "Shuin-sen" (Iwao, 1958). These were trading ships licensed by the shogunate in the early Edo period, from the end of the 16th century to the beginning of the 17th century, before Japan's long period of national isolation. Iwao (1958; 1966) has conducted research into the "Shuin-sen" trade. In the 32 years between 1604 and 1635, a total of 355 voyages were made. Of these, 14 (3.9%) were voyages to Annam, 55 (15.5%) were voyages to Siam, 37 (10.4%) were voyages to Tonkin and 71 (20.0%) were voyages to Champa. 34.4% of these voyages were made to locations in modern-day Vietnam (Tonkin, Champa and Annan).

2. Proposal for a Ceramic Trade Model

The ceramics unearthed from the sites in each area are thought to possess the attributes for the kiln that produced them and the period in which they were produced. By distinguishing between these attributes, it is thought to be possible to determine the nature of the trade in ceramics.

The sum of all ceramics unearthed will be represented by C (for ceramics), and their elements will be represented by c_i ($_i$ = 1,...n). The site at which the ceramic was unearthed will be represented by R_j ($_j$ = 1,...n) (Ruins), and the kiln at which the ceramics were produced will be represented by K_l ($_l$ = 1, p) (Kiln). Here n is a numerical value that identifies the element of the ceramics, m is the number of sites from which ceramics were unearthed, and p is the number of kilns at which ceramics were produced. The element possesses the attributes of the site from which the items were unearthed and the kilns at which they were produced. The relationship between ceramic c_j, site R_j and kiln K_l is expressed as shown in Equation 1 below:

$$c_i \subset R_j \cap K_l \qquad \text{Equation 1}$$

$R_j \cap K_l$ represents an item of ceramics produced by kiln l that was discovered at site j. If the sum of items is expressed as c_{jl}, then it is possible to note it as in Equation 2 below:

$$c_{jl} = R_j \cap K_l \qquad \text{Equation 2}$$

Table 2 shows the system of notation used for all sites and kilns.

The relationship between C, the sum of items of ceramics, and c_i and c_{jl}, can be expressed using the Equation 3 below.

$$C = c_l \cup,\ldots, \cup c_i = c_{11} \cup c_{12} \cup,\ldots, c_{jl} \qquad \text{Equation 3}$$

Tables 3 and 4 show examples of expression. Table 3 shows the relationship between sites in Japan and kilns in Thailand. Table 4 shows examples of sites in Japan and kilns in Vietnam.

Table 2: Relationship between kilns and sites

		Kilns			
		K_1	K_2	…	K_p
Ruins	R_1	c_{11}	c_{21}	…	$c_{p\,1}$
	R_2	c_{12}	c_{22}	…	$c_{p\,2}$
	…	…	…	…	…
	R_m	c_{1m}	c_{2m}	…	c_{pm}

Here the smallest elements, site (j) and kiln (l) have been used. To estimate larger movements of ceramics, the scope of the analysis can be limited in terms of the country (Thailand, Vietnam, Japan or other) for the site at which the ceramics were unearthed and the kiln in which they were produced. This enables the quantity of ceramic movement to be estimated for each country. Table 1 shows an example.

Moreover, the period in which the ceramics were manufactured will be expressed as T and the duration of that period as $\Delta\ t$. This will enable the movement of ceramics during a certain time period to be estimated using Equation 4 shown below:

$$c_{23}\,\Delta\, t = R_j \cap K_l\ \Delta\, t \qquad \text{Equation 4}$$

The movement of trading ships, the means of transport for the ceramics trade, is thought of in the same manner as in Table 2. The total number of trading ships is expressed as S (Ship)

Table 3: Transportation of ceramics between Thailand and Japan

		Kilns in Thailand								
		Mae Nam Noi	Si Satcha nalai	Bang Phun	Sukhothai	Ayuttaya	Chu Dao	Han nara	Others	Total
Ruins in Japan	Osaka/Sakai	29	3			-				32
	Fukuoka	4	3	10	5	-		4		26
	Oita	19	3							22
	Nagasaki									0
	Kagoshima	18	11	1	-	-	1			31
	Okinawa	30	9	7					30	76
	Total	100	29	18	5		1	4	30	187

Table 4: Transportation of ceramics between Vietnam and Japan

		Kilns in Vietnam				
		North	Gentral	South	Unknown	Total
Ruins in Japan	Osaka/Sakai				73	73
	Fukuoka	1	3		50	54
	Oita	9	5		9	23
	Nagasaki				69	69
	Kagoshima				20	20
	Okinawa		554			554
	Total	10	562			793

and each element is expressed as s_i ($_i$ = 1,...n) as shown in Equation 5.

$$s_i \subset R_j \cap K_l \qquad \text{Equation 5}$$

$R_j \cap K_l$ is the number of ships that transported ceramics discovered at site j from kiln l. If the total number of ships is expressed as s_{jl}, then this can be noted as shown in Equation 6:

$$s_{jl} = R_j \cap K_l \qquad \text{Equation 6}$$

The passage of trading ships between all sites and kilns is as shown in Table 5.

Table 5: Number of ships traveling between sites and kilns

	Kilns			
	K_1	K_2	…	K_p
R_1	s_{11}	s_{21}	…	$s_{p\,1}$
R_2	s_{12}	s_{22}	…	$s_{p\,2}$
…	…	…	…	…
R_m	s_{1m}	s_{2m}	…	s_{pm}

When element s_{jl} in Equation 6 above is greater than zero ($s_{jl} > 0$), c_{jl} is assumed to be the total number transported by that trading ship.

3. Development of e-TimeMap and Visualization of Ceramic Trade

The authors have developed a new software program called e-TimeMap for SEACT (extended **T**ime**M**ap for **S**outh **E**ast **A**sian **C**ommodity **T**rading). The ceramics data shown in Table 1 have been entered and the input data are displayed based on a time axis to enable the maritime routes of trading ships to be visualized together. This system was designed to survey the trends in Southeast Asian trade in ceramics.

Figure 1 shows one of the functions for displaying ceramics produced at ceramic producing areas in Thailand and Vietnam and shipped to various locations in Japan by "Shuin-sen", based on a time axis. Each figure is shown based on a time axis. These displays are shown in conjunction with the locations of the site and kiln and the navigational map (at left) in the same screen. Figure 2 shows the "Ryukhu-sen" route. Figure 3 shows the kiln sites of ceramic with a zoomed in images by clicking an appropriate button on the map shown in Figure 1 or Figure 2. Figure 4, which is derived from Figure 3, shows Si Satchanalai region of the kiln sites in Thailand.

The e-TimeMap system enables the visualization based on the ceramics trade model described in the previous section. The system also enables an understanding of the correlation between different events, based on a time axis and positional data. The development of this system is also thought to be significant as one example of the application of GIS technologies to historical research. Work is currently underway to enable three-dimensional recreation and visualization of "Shuin-sen" trading ships for incorporation into this system.

4. Conclusions

The archaeological data shown in Table 1 were analyzed using the ceramics trade model a nd the newly developed "e-TimeMap for SEACT" visualization system discussed in the previous section.

As shown in Figure 5, along with the beginning of trade by the "Shuin-sen" trading ships, the number of Vietnamese ceramics unearthed that were manufactured during this same period increased, consistent with the period of "Shuin-sen" trade. Figure 6 shows the data for items unearthed at the Hakata sites. From 1450 to 1590, the quantity of ceramics produced in both Thailand and Vietnam increased. As shown in Figure 7, the data for years prior to 1550 is unclear. The number of Vietnamese ceramics gradually increased during the period of "Shuin-sen" trade through the period of national isolation policy promulgated by the Edo shogunate. From the results

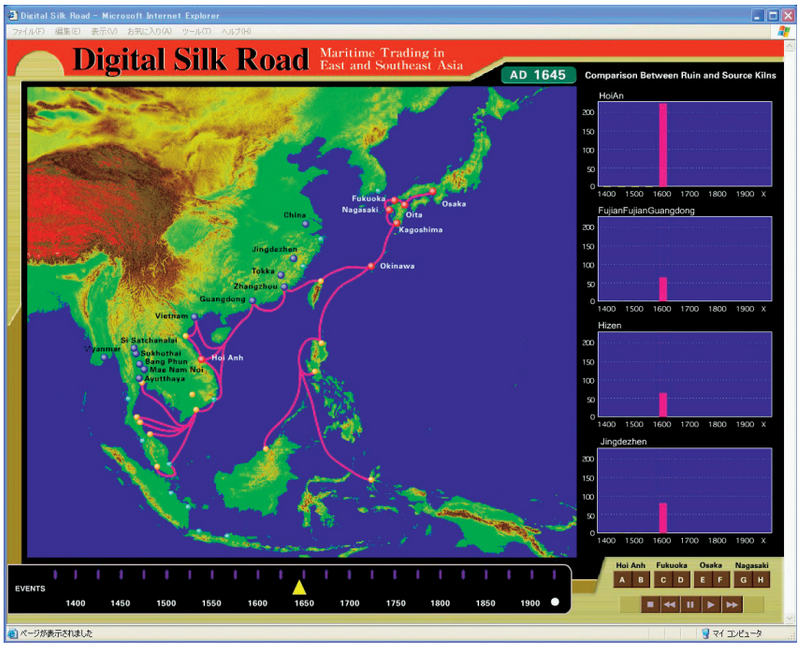

Figure 1: Maritime routes for the Southeast Asian commodity trade by “Shuin-sen”

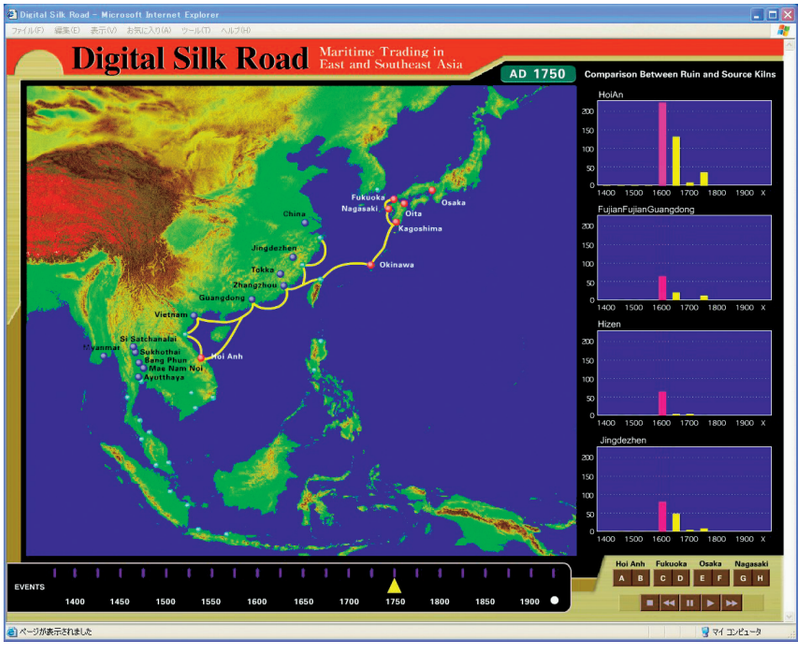

Figure 2: Maritime routes for the Southeast Asian commodity trade by “Ryukhu-sen”

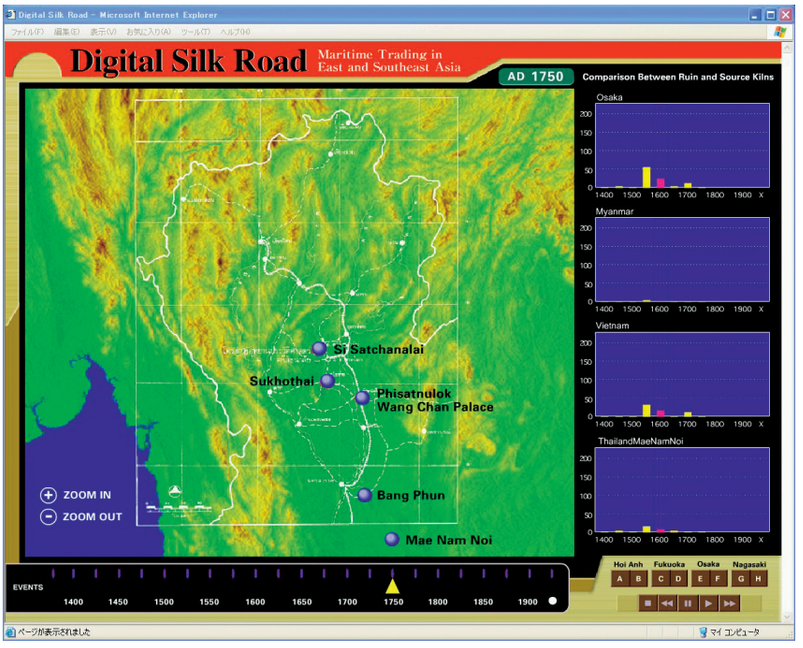

Figure 3: Kiln sites of ceramic in Thailand (Zoomed in on clicking in Figure 1/2)

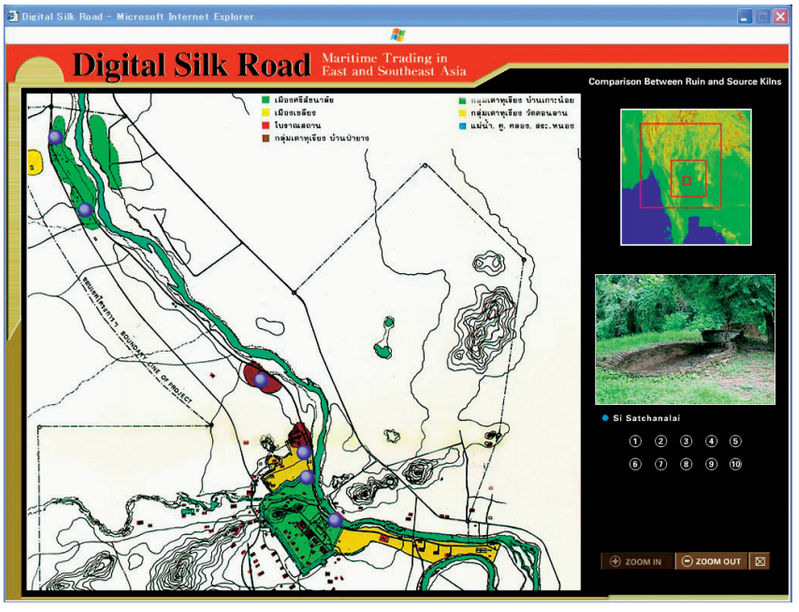

Figure 4: Kiln sites in Si Satchanalai region with the photo image (Zoomed in on clicking in Figure 3)

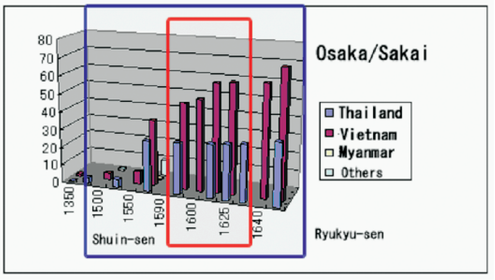

Figure 5: Vietnamese,Thai ceramics unearthed at Sakai sites (no. of items: 116)

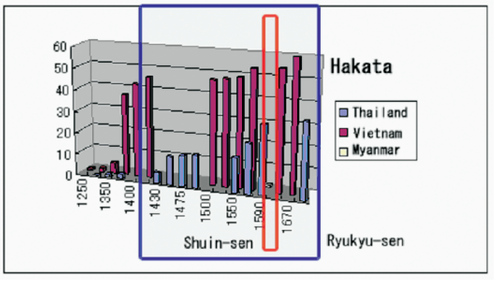

Figure 6: Vietnamese ,Thai ceramics unearthed at Hakata sites (no. of items: 97)

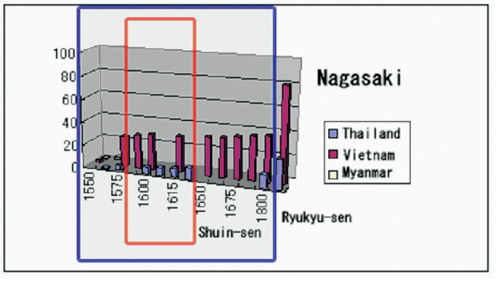

Figure 7: Vietnamese, Thai ceramics unearthed at Nagasaki sites (no. of items: 112)

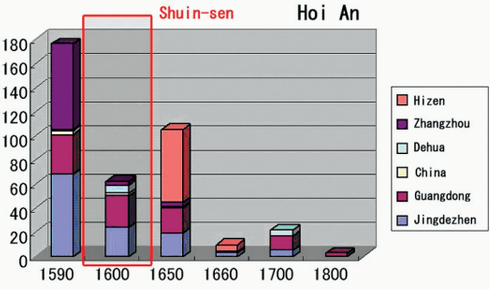

Figure 8: Chinese, Japanese ceramics unearthed at sites at Hoi An (no. of items: 378)

shown in Figure 8, it can be seen that many Japanese Hizen ceramics produced in the first half of the 1600s, immediately after the "Shuin-sen" trade, have been discovered.

The above discussion has focused on three primary sites in Japan and Hoi An in Vietnam. In the future, it will be necessary to pursue analysis of Vietnamese and Thai ceramics unearthed at Oita, Kagoshima and Okinawa in Japan.

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