A Study of Constructing of the Historical Ontology with Digitizing of Historical Materials

Yuzuru HAYASHI
(The University of Tokyo, Historiographical Institute, Professor)

【Outline of survey】
The goals of this study are: 1. To digitize images in films of historical materials collected and stored over the years in the Historiographical Institute of the University of Tokyo, and to define specifications of collected historical materials by digital imaging (Borndigital), and to put the defined specifications into practice on a trial basis, 2. To add meta-data to them and to build a seamless system for processes ranging from storing data in the Archive Hub (digital image storage of historical materials) to making image data available for public use, in order to promote high-grade computerization and sharing of research resources, and 3. To promote research of images and texts based on the digital image materials in the Archive Hub, establishing the historical ontology that integrates time and space information centered on historical figures. To achieve these goals, the workload will be shared between research groups specializing in system development, those specializing in historical knowledge and image material research, and those specializing in text research. First, the order of priority for digitizing materials will be defined on the basis of the magnitude of deterioration of films and the level of urgency thereof, and microfilms in existing collections will be digitized. Next, specifications for collecting materials by digital imaging (Borndigital) will be established and the system will be put into practice on a trial basis, and a server for storing the materials will be constructed. A system required for constructing the Archive Hub for managing materials obtained by research visits will then be developed. After that, meta-data about the collected data (e.g. owner, collected date information, and material group name) and newly prepared catalog data will be added to the data, which will be stored in pre-defined locations on the server. Meanwhile, leading-edge projects will simultaneously be promoted in the fields of images and texts.

Above all, this academic research showcases the evolution of existing organized research and storage systems for Japanese historical materials into the digital phase, and implementation of advanced computerization of research resources existing in the form of collected historical film materials.

【Expected results】
The system will connect text materials, which are retrieved from a search module as historical knowledge, directly with the images related to such historical material, thereby dramatically promoting network-based sharing of resources. Constructing the historical ontology, which means creation of the Historical Wissenschaftslehre (Historical Epistemology), will serve as a frontrunner in the development of Historical Informatics, and will greatly contribute to the maturation and development of the studies of Japanese history.

【References by the principal researcher】
• The Possibilities of Handwriting Analysis: Issues Concerning a System for Searching Kao.
• An Analysis of Historical Documents Concerning KumagaiNaozane's Priesthood and Death:
  Case Study on Text Criticism of "Azumakagami".

【Term of project】 FY2008-2012
【Budget allocation】 151,900,000 yen (direct cost)
【Homepage address】 http://www.hi.u-tokyo.ac.jp
The improvement of the Support system to decode excavated historical documents and the development of the comprehensive research center database.

Akihiro WATANABE
(National Institutes for Cultural Heritage Nara National Research Institute for Cultural Properties, Department of Imperial Palace Sites Investigations, Head of History Section)

【Outline of survey】
The objectives of this research are to archive knowledge and information related to “Mokkan” (wooden tablets) and other excavated historical documents, to share the knowledge and information widely, and to provide high performance retrieval methods for the knowledge and information.

Since the condition of the characters is aggravated by their missing parts and aging degradation, archiving and utilizing large amount of the knowledge and information are necessary to read the characters written on the mokkans. Therefore, by expanding our current research results (“Mokkanshop”: the support system to decode mokkans/“Mokkanjiten”: the database of the knowledge and information related to the mokkans), we conduct a new research to build the following items:
(1) A new support system to decode mokkans that contains high performance recognition/retrieval functions of the character patterns and communication functions for ubiquitous network among archaeologists and their knowledge (hereafter called “new Mokkanshop”).
(2) A comprehensive research center database that expands the knowledge and information beyond the time and place distances, standardizes the format to record the knowledge and information, and provides the links with GIS and historical document databases (hereafter called “new Mokkanjiten”).

Additionally, by interlocking new Mokkanshop and new Mokkanjiten, and by sharing the knowledge and information, this research starts and sustains the chain reaction between “decoding mokkans by using the archived information and knowledge” and “archiving the information and knowledge by decoding mokkans”.

【Expected results】
The “Comprehensive Research Center (CRC)” consisting of the new Mokkanshop and new Mokkanjiten becomes a breakthrough in the research areas of the excavated historical documents and history (especially, in the ancient time of Japan). Additionally, the CRC accelerates the researches of historical potteries and lacquered paper documents, works with other historical research institutes and databases. Moreover, the CRC can be utilized for the researches of historical Kanji documents in China, Korea, and other East Asian country, and for the researches of historical characters in the world. Finally, the CRC becomes an unprecedented research result of the historical research in the world.

【References by the principal investigator】

【Term of project】 FY2008—2012
【Budget allocation】 104,000,000 yen (direct cost)

【Homepage address】 http://hiroba.nabunken.go.jp/
Frontiers of Game Theory: Theory and Applications

Akira Okada
(Hitotsubashi University, Department of Economics, professor)

【Outline of survey】
The globalization of the modern society makes the interdependence of economic agents, at all levels of individuals, organizations, regions, and nations, ever more complicated. While there are more opportunities for cooperation, there are (probably even more) instances where the conflict of interest is so predominant to limit the efficacy of the market mechanism. Examples include the progression of global warming and the fragility of international financial markets. More generally, these problems tend to arise from such factors as uncertainty, externality, incomplete markets, imperfect information, and strategic interactions. Game theory is a fundamental tool to analyze these factors.

In this research, we ask how to attain efficient and fair social states through designing markets and institutions. For this purpose, we partition the research topics at the frontier of game theory into three groups, (1) dynamics and incomplete information of the market mechanism, (2) information and incentive in organizations, and (3) political economy; and assess the impact of interdependence across markets and institutions from a broad perspective involving cognition, emotion, rationality, information, evolution, and convention.

【Expected results】
The success of the project promotes the research of game theory in Japan, and enhances our academic status as a research center of game theory in the international community. The project makes it possible for us to construct an international research network. In the field of economics, our research of game theory complements the traditional approach of the general equilibrium theory, and improves the applicability of economic analysis to the factors, such as uncertainty, incomplete markets, externality, organizations and political economy, which may cause market failure.

【References by the principal investigator】
• Akira Okada, Game Theory, Yuhikaku Publishing Co., Ltd., 1996.

【Term of project】 FY2008—2012
【Budget allocation】 139,600,000 yen (direct cost)

【Homepage address】 http://wakame.econ.hit-u.ac.jp/~aokada/
## Joint Research on Innovation Processes among Industry, Universities and Government

**Hiroyuki Chuma**  
(Hitotsubashi University, Institute of Innovation Research, Professor)

### Outline of survey
This research project tries to understand, from theoretical and empirical perspectives, the main characteristics of innovation processes in Japan and pursue for the scheme for overcoming the weakness. In particular, the special attention is paid to science-based industries such as semiconductor, biotechnology, and pharmaceuticals. This research is conducted as the joint research among industry, universities and government. Specifically, New Energy and Industrial Technology Development Organization (NEDO), National Institute of Science and Technology Policy (NISTEP), Semiconductor Technology Roadmap Committee of Japan (STRJ), Japan Bioindustry Association (JBA), Japan Pharmaceutical Manufacturers Association (JPMA), and Office of Pharmaceutical Industry Research (OPIR) actively participate in this joint research project.

### Expected results
This project is quite unique in that it is conducted as the collaborative research among social & natural scientists and engineers in industry, universities and government. Hence it is expected to produce lots of original and rich academic research results that could fully satisfy international standards. Moreover, The results of this research project could provide many important implications for revitalizing Japanese National Innovation System that has started to lose its competitiveness. Interim and final results will be sequentially published in research papers or books and presented in international conferences.

### References by the principal researcher

### Term of project  
FY2008—2012

### Budget allocation  
109,200,000 yen  (direct cost)

### Homepage address  
http://www.iir.hit-u.ac.jp/
Spill-Over and Cycle Effects of Regional Integration: Growth and Cycles of Asia and Enlarged EU

Akira Kohsaka
(Osaka University, School of International Public Policy, Professor)

[Outline of survey]
Under the WTO-IMF regime the globalization of the world economy has increased international mobility of goods, services and capital flows. In addition regional integration has enhanced regional linkages where the expansion and deepening of production networks based on international division of labor has promoted regional economic growth (spill-over effects). Empirical research on these points is not well-developed yet, though.

Whether or not the enhanced linkage of capital markets has promoted economic growth has not been ensured by empirical research yet. Rather, it appears likely that enhanced capital movements increase financial risks so as to generate financial crises. The impact of integration upon business cycles, thus, tends to magnify the cycles through suppressing financial risks (cycle effects).

This study examines the spill-over effects of regional integration through production-networking in the Asia-Pacific region, the cycle effects through increasing and deepening assets markets as well as asset accumulation, and then the interactions between the two effects. Then this study scrutinizes some policy options and designs development strategies to cope with these changing industrial structures and financial markets.

[Expected results]
The engine of regional integration through trade and investment in the Asia-Pacific region is multi-national corporations rather than trade and investment agreements, while the enlarged EU aims at reforming industrial structures through active investment policies as its globalization strategy. This study will show how the regional integration shapes industrial structures and clarify the impacts of the spill-over effects on regional economic growth and business cycles. Meanwhile the enlarged EU tries to consolidate their macroeconomic policies by way of a common currency, whose experiences will give some important lessons to the Asia-Pacific region despite different initial and other conditions between the two regions. This study will highlight the complementary relation between financial intermediation and capital markets to live with cycle effects and design some regional currency regimes for stabilization and external adjustments in the region.

[References by the principal investigator]

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[Homepage address] http://www2.osipp.osaka-u.ac.jp/~kohsaka
A Comprehensive Study Examining the Forms of Social Stratification in an Aging Society and Constructing Public Norms

Sawako Shirahase
(The University of Tokyo, Department of Sociology, Associate Professor)

【Outline of survey】
There are two main objectives in this study. The first is to examine the forms and the generating mechanism of social stratification in an aging society. The second is to construct the theoretical concept of public norm, as the backbone of our aging society that maintains a high level of sustainability and of equity. We plan to conduct a large-scaled nationally-representative survey primarily targeted at the elderly in 2010. In this survey, we will interview not only respondents but also their co-resident members in the household, and the questionnaire for the family members living separately will be included. Case studies of the families facing economic difficulties such as lone-parents and single-person households will also be conducted. Based on such empirical analyses of various types of survey data, we will develop stratification theory that can explain socio-economic inequality in an ageing society.

【Expected results】
The previous stratification theory was primarily built on people’s social positions determined by the relationship to the labor market, and those who are either temporarily or permanently out (such as by retirement) of the labor market were left out. In contrast, our study will develop social stratification theory for the new era with ageing population to explore the mechanism through which the socio-economic resources are allocated in a rapidly aging society.

【References by the principal researcher】
・The Unseen Gaps in an Aging Society: Locating Gender, Generation, and Class in Japan (2005, University of Tokyo Press)

【Term of project】 FY2008—2012
【Budget allocation】 129,400,000 yen (direct cost)

【Homepage address】 under construction