

# EARLY JAPANESE GAMING SIMULATION EFFORTS

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## ABSTRACT

*Research on “ENREN”, a Japanese term no longer current meaning “a gaming simulation,” was pioneered in July 1941 in Japan. A national graduate school of gaming was established under the administration of the civilian Prime Minister on September 30, 1940. Until the school closed on March 31, 1945 due to the worsening of the war situation, over 100 participants had graduated from the school. Around the same time, another ENREN was conducted by Ayukawa Yoshisuke, an entrepreneurial tycoon. This paper will also introduce the concept of the first economic-business gaming simulation founded by the Japanese tycoon in order to pursue the theoretical and practical questions of the origins of social systems gaming simulation in Japan by connecting the two ENREN gaming simulations. This research from a historical perspective would assist in the establishment of the science of gaming simulations.*

## INTRODCUTION

The science of gaming simulation can be seen as essentially a social science discipline. Theories arising from the social sciences are reflected in the development of societies. Researchers on gaming should also learn from history in developing theories of gaming because a scientific discipline that lacks theoretical support can never survive among the competitive fields of social sciences. The academic objective of this research is to contribute to the establishment of a theory of gaming. This historical research (Ichikawa, 2003&2004) has only been developed part way in establishing a foundation for gaming science because of difficulty in discovering and recovering historical materials, many of which are now just fragments.

Historically and as an academic field, the “Theory of Gaming” was first defined by Shubik (1975). Duke (1974: x-xi) who also proposed 25 hypotheses for gaming simulation summarized on the birth of gaming as follows:

*World War II spawned at least five developments that have been woven into the fabric of gaming: computers, operations research, the mathematical theory of games, simulation, and the early business games. “Gaming” for social science purposes did not emerge in its own right until the early 1960s; and the various gaming products of the ensuing decade reflect an initial confusion in its application.*

In addition to the Duke’s 25 hypotheses, for example “games employ supersymbols, carefully referenced to a conceptual map as a device for conveying gestalts” (Duke, 1974:118), for the development of gaming simulation, this paper will introduce earlier concepts from the first economic-business gaming simulation created by Ayukawa Yoshisuke, a Japanese business tycoon, as well as the gaming structure of the first policy-economic gaming simulation by the Japanese fathers of gaming. Both gaming simulations were conducted between June, 1941 and probably July, 1944.

## HISTORY OF SOCIAL SYSTEMS GAMING TO BE REVISED

Almost all of the papers and books on the history of gaming simulation commonly used by gaming researchers quote from a single RAND report (for example, Specht, 1957) published in 1957 just before the first well known business game. The following excerpt is what is most frequently quoted from the report:

*Just sixteen years ago a so-called “research institute” was set up, an institute of a very peculiar kind and with peculiarly limited aims. This was the Total War Research Institute, established in October 1940. Here military services and the government joined in gaming Japan’s future actions: internal and external, military and diplomatic. In August 1941 a game was written up in which two year period from mid-August 1941 through the middle of 1943 was gamed, was “lived through” in advance and, of course, at an accelerated pace. Players represented the Italo-German Axis, Russia, United States, England, Thailand, Netherlands, East Indies, China, Korea, Manchuria, and French Indochina. Japan was played, not as single force, but as an uneasy coalition of Army, Navy, and Cabinet, with the military and the government disagreeing constantly – on the decision to go to war, on X-day, on civilian demands versus those of heavy industry, and so on. Disagreements arose and were settled – in the course of an afternoon, at the pace of this game – with the military group, by the way, as the more aggressive one, winning the arguments.*

In the early business game era, researchers and developers of business games (for examples see Jackson, 1959; or Cohen & Rherman, 1961) often referred to the Japanese war game as a direct ancestor to business games. The success of early business games encouraged the effort to try to establish a continuous chain of prior art with social

games, and so research professors in international relations (Guetzkow, 1959) and then other social sciences started to join the development of gaming systems especially for educational use.

At the time the report was published, the only games known of were the war games that had only been employed in military institutions, and a social game. It was natural and reasonable that they identified and classified this game with the war game because they had no foresight yet into the possible usefulness of the game approach to studying the growing complexity of social problems in the future.

I have long wanted to do research into the history of the original Japanese war games ever since I came across a short paragraph on it in a booklet distributed by the Center for Multidisciplinary Educational Exercises (known as COMEX) of the University of Southern California in 1983-4 when I was a Fulbright young professor at the Institute of Safety and System Management, USC. COMEX provided me with an opportunity to observe the METRO-APEX exercise, a regular course for students in public administration then (McGinty, 1981).

In the introductory section of the booklet, a brief history of gaming simulation was surveyed. For most people, an acceptable definition of this discipline is that it is a simulation of some social processes, where the simulation is carried out by humans alone, a human-computer interaction or by computers alone. This definition would emphasize the significance of the differences between a narrow military war operation game and a social or serious game. The brief history explained that the Japanese war game run in 1941 was “just” a war game, albeit one that the Japanese relied heavily on in those days, but that it might be interpreted as possibly the earliest ancestor of social or serious games.

During my sabbatical stay at the School of Information, University of Michigan in 2002-3, I set out to do the research into the actual details of those early Japanese war games. I thought this would be a good opportunity since the university library network has a well reputed Japanese library, with especially the rich holdings on the International Military Tribunal for the Far East. Eventually, pursuing the war games references led me to discovering a social game in the book “Pearl Harbor” (Wohlstetter, 1962: 355-356). The following is an excerpt concerning another war-game-like game having been long forgotten in the history of gaming simulation.

*One of the most interesting examples of the Japanese inability to understand American psychology was a combined political-military game played out by the Japanese during the month of August 1941 (Evidence for this game is fragmentary, since the legal staff engaged in research for the Tokyo War Crime Trials was primarily interested in establishing the existence of the sponsor). This game, though not so well known as the naval war game played in September, attempt to deal with some long-term considerations. The participants, drawn from the Army, the Navy, and the government ministries, were members of a*

*Total War Research Institute in Tokyo.... The countries represented included Italy and Germany (treated as one), Russia, America, England, Thailand, the Netherlands, East Indies, China, Korea, Manchuria, and French Indochina. With fidelity to the actual domestic scene, the players did not represent Japan as simply one team with a single interest, but as a coalition of conflicting interest that had to reach an agreement on major issues. There was, for example, disagreement as to the inevitability of war, the date and manner of beginning the war, the number of adversaries to be engaged, and the economic controls needed to support the war.*

As the book was published in 1962, the author seemed to have some familiarity with, but no expert knowledge about serious games in social sciences, such as business games and international relations games. She tried to distinguish political-military games from war games as can be seen from her careful usage of the two terms. Her introduction to the policy-military game was just enough encouragement to motivate me to do historical research for the Japanese society of gaming simulation. (Eventually, as a result of much time consuming document retrieval, I would find that about half of her introduction was actually a misunderstanding.)

Unfortunately, her introduction to the policy-military game or the first gaming simulation in Japan would turn out to be far from the actual historical events.

One thing that should be pointed out is that both authors must have been closely referring to the same single resource, that resource I believe was the official record of proceedings of the International Military Tribunal for the Far East (all in English) dated October 29 and 30, 1946.

I myself started to read the record of the proceedings of the International Military Tribunal for the Far East, in particular, those numbered 100 and 101. Eventually I have come to believe that the war gamers involved were more interested in purely military war games and not the larger social games issues. As a result the first social game in Japan has been ignored both in the historical record and academic study.

I discovered the existence of a judging group in the game that every other reporter and investigator missed. Two of the exhibits listed a “Judge Saidaijo for the decisions of the Ministry of Commerce and Industry” (the military officer translating Japanese to English should have translated the original Japanese as “referee” and not “judge”), because his functions were clearly that of document recipient, who did human-simulation of the relevant industries, and then issued back a constraint card (in the terminology of gaming) for the next consecutive round. I then visited several libraries in Japan and as a result I found in the National Archives of Japan there is only one single record remaining. The record, about the size of page and a half page size of A4 letter paper, lists all the judges of the game. The judging group consisted of 34 specialists and five secretaries. This group was divided into four teams

according to their specialty and only one of them was composed of eight military personnel.

## THE POLICY-ECONOMIC GAMING

### GRADUATE SCHOOL OF GAMING

The Japanese Total War Research Institute was established under the administration of the Prime Minister on September 30, 1940. It was a school of gaming; the name however can be misunderstood as a military organization. The academic year started on April 1 and ended on March 30 of the following year. The school's enrollment in the years 1941, 1942 and 1943 was 35 or 36, 39 and 40 respectively.

As a school of gaming, the institute conducted a policy exercise game for only the graduate students of the first academic year. Because the Japanese civilian government was replaced by a military government on October 18, 1941, the game was run only once between June 11 and November 26, 1941. The final phase of the game started on September 29 and continued until November 26; each of the players were supposed to write his thesis on his roles in the game, but taking into consideration his expert knowledge from his own real-life profession.

### GAME CONSTRUCTION

The game was designed, constructed and carried out in the form of a dialog, "Experts-to-Experts mode" as a way of forming a more perfect communication about the totality of war planning that was being pursued. The game probably consisted of self-learning, team-learning, play of game, post-presentation and debriefing phases. The self-learning phase was probably carried out between June 11 and July 11 in 1941. The issue seminar was probably carried out between July 12 and 30. The playing of the game was probably carried out probably between August 5 and 26. The post-presentation was probably carried out on August 27 and 28 with the participation of the real-life prime minister and his real-life cabinet ministers.

## PARTICIPANTS

The players of the game were selected from different sectors. Most of 36 players were governmental officials. Eight of them however, were from the private sector. Only six players were from the military. Their ages ranged from 30 to 37; with an average of age of 33 years. Therefore, the players were highly educated with career experience of 10 years or more in planning and decision making. They were promising junior leaders of larger organizations.

### GAME DIRECTORS

The board of game directors had two functions in the running the game. Firstly, the directors were responsible for the operation of the game. Secondly, the board itself produced model components of economic, political and military process natures. The forms of the models were simulation and heuristics. Table 1 shows the members and the tasks of the board of game directors. The referees conducted themselves in a total simulation with inputs from the accounting system. The three directors probably conducted themselves in heuristics as they represented the Emperor's supreme command to the Army and Navy.

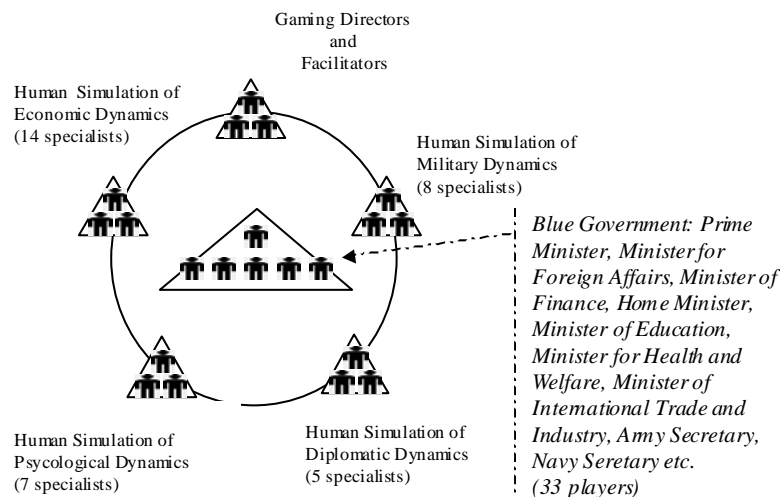
**Table 1 Gaming Designers and Directors**

Name	Position	Rank	Niche
Y. Iimura	Director	Lt. General	Expert on US and USSR
C. Matsuda	Professor	Captain	Expert on US
K. Horiba	Professor	Colonel	Expert on USSR and China

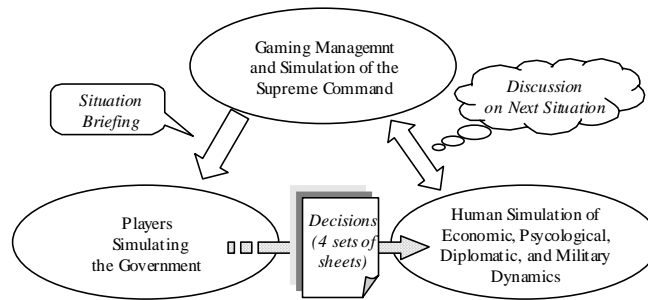
### THE PROCEDURES OF PLAY

Figure 1 shows a simple representation of the play phase of the game. The blue government was a team of players with gamed-roles. The chief director assigned one of the graduate students from the private sector to the prime minister. This player was assigned a role completely

**Figure 1 Construction of the Game "ENREN"**



**Figure 2 A Gaming Round**



**Table 2 Accounting system (Human simulation)**

Accounting teams (Judging teams)	Number of specialists	Domains	Number of secretaries
Economic simulation team	14	Economic problems, material mobilization, human resources, food production, transportation, communications, and finance	2
Psychological simulation team	7	Education, thought control, physical education, land security, and media strategy	1
Diplomatic simulation team	5	Diplomacy, the U.S., Europe, South Sea states, and the Soviet Union	1
Military simulation team	8	Military operation, preparedness for land engagement, a preparedness for naval engagement, and r preparedness for air defense	1

different from his profession in order to avoid the negative effects of bureaucracy. Other players generally were assigned their roles based on their real-life professions.

The play consisted of a series of cycles, seven rounds (Figure 2). Each round started with a mini-critique session, probably lasting a couple of hours. The chief game director managed this critique by providing players with the latest situations that developed based on both the outputs of the accounting system and the heuristics of the supreme command.

Following the chief director’s critique the next phase of a round was survey, then discussion, and finally interaction. The output of the phase was a report of decisions. The decisions were processed through one of the four domains of the accounting system according to the administrative authorities with which players were assigned based on their gamed-role.

**ACCOUNTING SYSTEM**

The accounting system of the game seemed to be a complex one because it involved 34 specialists. It was a rather complex model because players were supposed to pursue the totality of war planning. The range of domains the human accounting system had to take into consideration extended to social dynamics as well as military strategies. Table 2 shows that each team of the accounting system had its own domains of responsibility for decisions made by the “Ministers.”

**ROUNDS OF PLAY**

The gaming itself comprised 14 rounds. Round 1 consisted of assignment of work given to all of the players: the investigation of the national policy, strategic planning for total warfare economics, and the judging of situation necessary for the above. Each player had to work that out individually. In Round 2 the government of “The State of Blue Land” was organized constituting all of the players and they were required to do the following work: the planning for a total war strategy and preparation for total war strategies.

In Round 3 to 9 the players repeatedly participated in the cycles of a gaming round. Each round lasted two or three days of game times or imaginary times, from August 1941 to October 1942. In this sense, the game was an exercise in policy formation for the future.

The total courses of the first Japanese gaming simulation probably ended on November 26, 1941 (for further information see Ichikawa, 2007).

**EXOGENOUS REVIEW**

The final phase, an exogenous review which focuses the player’s attention on the real-world problem (Duke, 1974: 131), also appeared to have been carried out. The tentative conclusion of the exogenous review from the debriefing was that Japan could lose a war against the US in a few years because of lack of economic power. The game directors and players gathered in the official residence of the real-life prime minister and presented the report to the real-life prime minister and his real-life cabinet members

including the ministers of the Army and Navy in August 27 and 28, 1941. The minister of the Army, who would be appointed prime minister two months later by the Emperor, immediately prohibited them from making the contents of the report public.

## **THE OBJECT OF THE POLICY- ECONOMIC GAMING**

### **DESIGN CONCEPT**

The International Military Tribunal for the Far East took place between 1946 and 1948. During the tribunal the cross examination on ENREN matter unexpectedly lasted for only two days even though the name of the institute, "Total War Research Institute," indicated its concern with the total Japanese planning of World War II. Speaking as a witness for the Allied Forces prosecution, Kazuo Horiba, who represented the faculty of the institute, gave the following testimony, which is an exact quote from the English record of the proceedings of the tribunal dated October 29 and 30, 1946.

*The aim of the so-called table-top discussions was generally in accord with the education objective of the Institute. It was believed by the Institute that lectures alone were not sufficient in carrying out the aims of the Institute, and for that reason, in order to make more practical the training of the mental faculties, mental efficiency as well as the efficiency of cooperative action, and to develop over-all efficiency in their studies, certain hypothetical conditions were conceived and different branches of the studies -- members belonging to different branches of their studies were permitted on the basis of those hypothetical conditions to work out their specific subject matter; and, therefore -- and then to cooperate with other branches in order to carry into practice theories with respect to cooperative action, and this was felt to be necessary in making the lectures and the studies in the Institute more practical. Those who participated in these table-top studies or maneuvers would readily understand how -- what kind of hypothetical conditions were conceived for study purposes. These various hypothetical conditions or hypothetical -- or work problems were selected by several members of the Institute and given to the students to work out in all their various ramifications. The aim of these table-top maneuvers or studies were to be found in the fact that given certain hypothetical conditions, the students would, each of them, work out the problem assigned to him; and after making a study, he would announce this to a group meeting of students who were connected with the maneuver or study itself, and there exchange opinions and by repetition of these exercises, it was possible to foster a consciousness of cooperatives effort and the bringing together of minds in order to work out problems cooperatively.*

*Now, as to why such maneuvers were regarded necessary, I must say that inasmuch as one of the*

*educational aims of the Institute was to promote cooperative thinking and cooperative action, and because the general tendency in the country was divergence of opinions and conflicts between government departments as well as between different private and public organizations, that it was considered highly necessary and essential that cooperative thinking and cooperative action should be fostered by the Institute for permeation outside as well, and, therefore, studies were carried on with this idea in mind.*

Interestingly and importantly, Kazuo Horiba called the main phase of ENREN a table-top discussion or maneuver in his testimony. During the two days, a Russian prosecutor pointed out that that was a game. This is therefore a game. The prime purpose of the game was to establish dialog among the players to promote the exchange of opinions. As Kazuo Horiba testified, most importantly this game was communication-oriented. A game is an abstract representation of human-made complex institutions. From a well-known game designer's point of view (Duke, 1981), a game should have twelve basic elements: (1) scenario, (2) pulse, (3) cycle sequence, (4) steps of play, (5) rules, (6) roles, (7) model, (8) decision sequence, (9) accounting system, (10) indicators, (11) symbology, and (12) paraphernalia. Those basic elements, which a game is supposed to consist of, were exhibited in the court proceedings

### **FROM MAP MANEUVER TO TABLE-TOP MANEUVER**

The objectives for this policy exercise game were necessary even essential. The pioneers of the gaming school who invented the social game by extracting a gaming frame from the experiences of war gaming thought that the general tendency in Japan was divergence of opinions and conflicts between government departments as well as between different private and public organizations. To best overcome this tendency, the institute tried to foster cooperative thinking and cooperative action to be spread outside as well.

The faculty believed that lectures alone were not sufficient in carrying out the objectives of the institute. To achieve more practical training of the mental faculties, mental efficiency as well as the efficiency of cooperative action, and to develop over-all efficiency in students' studies, certain hypothetical conditions and different branches of the studies were to be conceived. Players belonging to different branches of their studies were permitted on the basis of those hypothetical conditions to work out their specific task. One prosecution's witness, Horiba, gave testimony saying "Those who participated in these table-top studies or maneuvers would readily understand how -- what kind of hypothetical conditions were conceived for study purposes." In his testimony, the new word, "Table-top maneuver," was used instead of "Map maneuver" to distinguish between the two. A social game was, therefore, born out of war games in Japan.

The prime purpose of the game was to establish dialog among players for the exchange of opinions. Various hypothetical conditions were selected by several members of the faculty and given to the students to work out in all their various ramifications. The students would, each of them, work out the problem assigned to him and after making a study he would announce this in a group meeting of students who were connected with the game exchanging opinions. By repetition of these rounds, it was possible to foster a consciousness of cooperative efforts and the bringing together of minds in order to work out problems cooperatively.

## **AYUKAWA YOSHISUKE'S ECONOMIC-BUSINESS GAMING**

### **KEY FIGURES IN MANAGEMENT**

Witzel (2003) lists the life and ideas of influential people who have helped redefine the way we think about management. The fifty key figures include Alfred D. Chandler, Henri Fayol, Henry Ford, Bill Gates, Philip Kotler, Abraham Maslow, Henry Mintzberg, Tom Peters, Michael Porter, Herbert Simon, etc. Those figures are relatively popular among Japanese management. Some of them are very popular even among MBA students because they have written papers and books on Japanese management styles. As for Japanese top managements, among the fifty key figures the most influential figures are still W. Edwards Deming and Peter Drucker. Wolfe (2003) states that both taught at NYU Graduate School of Management and they were "scorned or ignored" in the United States of the 1950s.

As I am a gaming scientist, it is not surprising to me that Jay Wright Forrester is on the list. And as for Japanese key figures, the list includes Ibuka Masaru (Sony), Matsushita Konosuke (Matsushita/Panasonic), Toyoda Kiichiro (Toyota), etc. It is not surprising but disappointing that the list misses "Ayukawa Yoshisuke." The reason is straightforward; there are few comprehensive articles on Ayukawa Yoshisuke in English, except for an excellent book recently made available by Iguchi (2003) "Unfinished Business: Ayukawa Yoshisuke and US-Japan relations, 1937-1953."

### **AYUKAWA YOSHISUKE AS A JAPANESE BUSINESS TYCOON**

Here follows a short profile of Ayukawa Yoshisuke (in the Japanese order with a family name first and personal name last), Japanese businessman or rather industrial tycoon, for more see van Wolferen (1989: 375-407).

He was born in western Japan in 1880. In 1903, he received a B.E. from Department of Mechanical Engineering, University of Tokyo. He began to work in Toshiba as an unskilled manual worker from the bottom. In 1905, he visited United States in order to work for the

Malleable Iron Company, Erie, Pennsylvania, pretending to be an ordinary foundry worker. He had the help of some local managers who were the only ones knowing his real identify. After the two years stay, he founded some companies including Nissan Motors and Hitachi Works. He turned the Kuhara Mining Company into Nissan in 1928 with the Nihon Sangyo Industry. He was the founder and first of the president of the Nissan Group between 1931 and 1945.

In 1937, as head of the Nissan Conglomerate, he moved to Manchukuo (Japanese indirectly occupied war time Manchuria, 1932-1945. part of China, 1945-) and formed a close relationship with the Army administration there. He took charge as chairman of the Manchurian Industrial Development Company, or rather the "Manchu Industrial Conglomerate".

In this position he guided all industrial efforts in that country, implementing during the 1930s two five years plans, following the economical and industrial plan lines organized for that nation by State Secretary of Manchukuo. He set up some loans from American steel industrialists to support the Manchukuo economy in the initial period of the Japanese administration there, before 1941. Besides this, he proposed Fugu Plan, which brought Jewish refugees to Manchukuo. He predicted the German defeat and clash with the army. Because his global capitalism began to conflict with the nationalism of the army, in 1942 he resigned as chairman of the Manchurian Industrial Development Company, and moved back to Japan.

He was incarcerated in prison in 1946-1947 as a suspected Class A war criminal, but was freed when found innocent of the charges. He then decided to play a key role in post-war economic reconstruction and purchased a commercial bank to organize loans to small companies. With the help of Nobosuke Kishi, prime minister, 1957-1960, he achieved his goal in implementing an economic-control law and policies as leader of a strong pressure group that became the main federation of small and medium sized companies in the 1960's. He died in 1967.

Recently, with the growth of global capitalism his holistic business concepts are attracting attention among Japanese business leaders.

## **THE RESEARCH INSTITUTE OF ECONOMIC-BUSINESS GAMING**

Quite recently, I have discovered that another gaming simulation was conducted in 1943 and 1944 by a private research institute (see Iguchi, 2003: 188-190), one established by Ayukawa Yoshisuke, the founder of the Nissan Conglomerate. During the era of the recovery of Japanese industry in the 1960s and 1970s, NISSAN was one of the biggest corporations and a leading user of computer-based business games for training their employees. Ayukawa adopted the basic concept and structure of the ENREN to his own economic-business gaming, probably for predicting how the Japanese industry would recover

after the end of the war. I have just begun my analysis of this second Japanese gaming simulation. Quite likely this second social system game was the first economic-business gaming developed in Japan. He tried to mix this first economic-business game with the policy-economic game but the Japanese military government did not permit him to pursue his ambition, probably because the result of the gaming was expected to be against the total war policy.

On December 27, 1942, at the 10th stockholders' meeting of the Manchurian Industrial Development Company, Ayukawa announced his retirement as chairman. At the same time, his announcement continued to inform them of the creation of the Giseikai, a research institute for economic-business gaming. The establishment of the research institute had been authorized the government on September 18, 1942, with Ayukawa's funds, JP Yen 135 million, which were equivalent to 0.3 percent of the annual national budget.

In 1945, the Giseikai was shut down by the order of the General Headquarters of the Allied Forces. Research and practice in gaming simulation in Japan was halted for a long time, until the 1960s when "Business Game – Play One" would be "imported."

## THE ECONOMIC-BUSINESS GAMING

### DESIGN CONCEPT

The mission of the research institute of economic-business gaming was to conduct a holistic approach, that is, gaming simulation, to the future planning of the national economic policy. Ayukawa own design concept was made public at the first board directors' meeting dated January 25, 1943 by the opening speech (an excerpt below).

*The purposes of my endowed institute are my serious concerns. Researches, experiments, ENREN are some of the ways in trying to pursue an undertaking. I would put my emphasis on ENREN. ENREN would correspond to map maneuver in military term and can be also called mock war operation. ENREN is an economic, financial mock war operation. An experiment is performed with the use of test tubes in an initial state in a laboratory. Research is as what all of you know.*

*You may know the recent establishment of "The Total War Institute." They have started with the research concept of a long term planning, a "The Hundred years War," which performs ENREN based on the world situation. I consider it praiseworthy that ENREN is being used in this research.*

*At present, although there are experiments in industry and exercises in the military, it is not used in economic policies. For example, in the Ministry of Agriculture, in whatever thing it wanted to do, through a cabinet decision, they proceed to push through with the project. Without performing a trial study, aren't they making the citizens guinea pigs in the process? What about using some amount of money to perform a small scale trial? Doing things by*

*armchair work alone neglects such factor such as time scale. The past and the future will become less involved in their policies There is a need for such a research agency to do this kind of study.*

*As an example of ENREN, suppose we consider how an amount of money should flow, whether to the bank as a deposit, or to change it into public bonds so that the money flows to the Bank of Japan. This can be imitated first through the use of pipes, tanks and pumps with yellow colored water to represent cash flows and then with green colored water to represent government security. Through imitation of flows we can foresee bad and good cash flows. If there are 50 experts involved in this project, 50 experts will come together in a laboratory to separately operate valves at joints and separators of the pipes to adjust and control the flows of colored water in such imitation. We can try out government fund policies and foresee possible oversights and illusions in the process, better than when we do it by deskwork.*

Ayukawa Yoichi, the eldest son of Yoshisuke, presented to Joseph B. Keenan, chief of the International Prosecution Section, a petition, dated April 8 of 1946, insisting his father innocent of the charges against him. He wrote in the petition that his father had organized the Giseikai for studying clearly the deficiencies in the economic and industrial organizations of the time, and that his father had started a new peace movement in midst in war basing its guiding principle on the economic theory of James D. Mooney's book "The New Capitalism."

Eventually, not finding any copies of that book in Japanese universities, I decided to import a copy from a US used bookstore. The moment that I opened the book, I thought that the real author might well be Jay Wright Forrester (1961).

## ECONOMIC-BUSINESS DYNAMIC SIMULATIONS

### JAMES D. MOONEY AS A MANAGEMENT SCHOLAR

Another one of the fifty figures (Witzel, 2003) is James D. Mooney, engineer and corporate executive (see Georgetown University Libraries Special Collections). He was born in Cleveland, Ohio in 1884. In 1908, he received a B.S. from Case School of Applied Sciences in Mining and Metallurgy, leaving soon after graduation for gold mining expeditions in Mexico and California. Between 1910 and 1917, he worked successively at Westinghouse, B. F. Goodrich and Hyatt Roller Bearing Company during which time he became increasingly involved in corporate management. At the close of the First World War (1914-1918), Mooney was named President and General Manager of the Remy Electric Company, a subsidiary of General Motors Corporation. In 1922, he became a Vice-President of GMC and President of General Motors Overseas, with business in more than one hundred countries. As part of his

responsibilities in managing overseas production, Mooney travelled extensively throughout the world, visiting GMC's numerous manufacturing and assembly plants. In this capacity, he was afforded the opportunity of meeting with top-flight government officials and others in positions of power and influence, and with them discussed not only their own economic problems but also the impact of the international situation on their own countries and on economic affairs.

He became a pioneer in the development of management thought and the nature of organization. Many of his theories and practical experiences were widely read and studied in "Onward Industry" (Mooney and Reiley, 1931). Another book, lesser known compared with this book, is "The New Capitalism" (Mooney, 1937). The success of GMC Overseas was due in large part to Mooney's ability to adapt American methods and technology to existing conditions of amazingly diverse natures. In 1940, Mooney resigned as President of GMC Overseas to chair a small group of directors responsible for converting General Motors domestic plants to wartime production. Soon after, Mooney volunteered for service in the Production Engineering Section of the Bureau of Aeronautics, eventually joining the staff of the Chief of Naval Operations. After the Second World War (1939-1945), Mooney returned to General Motors Corporation, leaving in 1946 to become Chairman and President of Willys-Overland Motors, Inc. He died in 1957.

In comparison the profiles of Ayukawa Yoshisuke and James D. Mooney, we find that there are many similarities between them. They were of the almost same age, graduates in engineering, having multicultural experiences, of top management in the automobile industries, etc. The most noticeable feature was that both of them had the capability of gestalt thinking which is essential for modeling complex social systems.

## THE ECONOMIC AND BUSINESS SIMULATIONS OF STOCKS AND FLOWS

Mooney's gestalt thinking is presented in about 40 paper-based economic-business simulations in his book, "The New Capitalism" (Mooney, 1934: vii-viii) :

*This book attempts to provide a means for the discussion and solution of economic problems. Whatever freshness may be found in this approach really consists in projecting into the discussion of economic problems the discipline of the methods of science; and in using physical analogies as a help in exploring and explaining economic law.*

*A remarkable improvement and a healthier equilibrium in our national economy could be hastened by a widespread understanding of economic laws, and public acceptance of these laws in the spirit of the American tradition. Were our people to have a clear conception of the basic elements of supply and demand, production and distribution, purchasing capacity and real wages, and of the economic and social value of the American Constitution.*

*The method of presentation has been designed to bridge the seeming yet actually non-existent gap between the simple economics of housewifery, housekeeping and village life and the large-scale economics of America.*

The book illustrates holistically the economics of the United States with 43 paper-based simulation models. All the simulation models are described with the use of pipes, tanks and pumps with colored water to represent cash flows and stocks. The models cover theories and case studies in top-to-bottom manner, including the law of supply and demand, the medium of exchange, gold-currency-credit, paper money prices, inflation, the gold standard, credits and debts, the world market, distribution, etc. Mooney could manipulate with color pens and sheets of paper those models in the same way of simulation gaming as the "Beer Game" (Sterman, 1989) works, because those are of stock-flow or level-rate model. Some of his simulations are the following easily understandable examples.

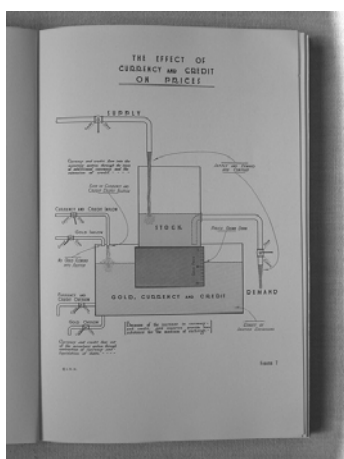


Figure 3 Mooney's Simulation 7

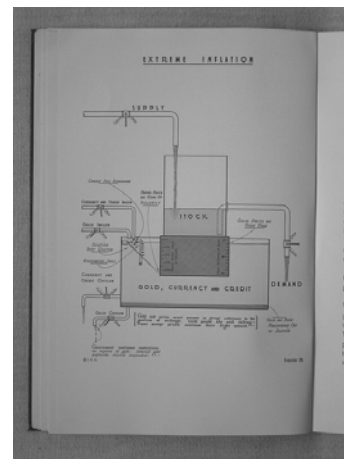
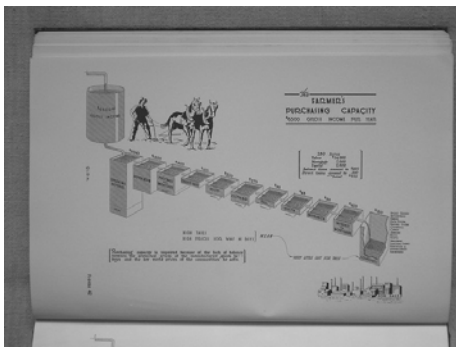


Figure 4 Mooney's Simulation 16





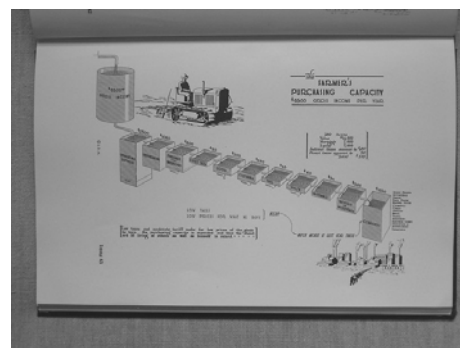
**Figure 5 Mooney's Simulation 42**

Figure 3 shows a dynamic simulation of the effect of currency and credit on prices. It makes a drop in real or gold prices when currency and credit are pumped into the solution and the density is lowered. This simulation can be run with turning 6 valves at specific positions. Figure 4 presents the situation of extreme inflation. The valve of currency and credit inflow is set at a higher opening, but the valve of gold inflow is closed. Theoretically, paper prices should then rise. But the simulation shows real prices (gold prices) will depreciate. Figure 5 and 6 relate to farmer's business environments, that is, higher taxes and prices, or lower taxes and prices. It seems that Mooney does simulation, or he himself does gaming to pursue the soundest solution of farmer's problem for not only their own self-interest but also American interests generally. This social cognition could be achieved only by a future language having a very high capability for conveying gestalt, or holistic imagery (Duke 1984: 27).

### ECONOMIC-BUSINESS GAMING SIMULATIONS

I have not yet discovered what the details of the steps or rounds that formed the the Geseikai gaming simulations. Ayukawa Yoshisuke once wrote his memories in 1953. However, they were never published; a draft is available for reading at the Japanese national diet library. In the draft, what he first mentioned were how efficient business organizations should be formed, and what the purpose governmental agencies' administrative directions should be. This gaming approach seemed to be applied to major industry segments, such as coal, iron and steel, shipbuilding, etc. What I have just discovered in relation to gaming simulations is a five page report about a scenario in the shipbuilding industry. Probably another one or two years will be required to reconstruct Ayukawa Yoshisuke's gaming simulations. At the present as I am writing this paper, only sketchy information about the following gaming simulations is available.

Economic-business gaming simulation 1: this gaming was developed and conducted between December, 1942 and February, 1944. The model represented the shipbuilding industry. About 30 players were involved including three top executives from an automobile corporation, a railroad corporation, and an oil corporation.



**Figure 6 Mooney's Simulation 43**

Economic-business gaming simulation 2: this gaming was developed and conducted from June, 1943. When the gaming ended is unknown.

Economic-business gaming simulation 3: this gaming was developed and conducted from September 1943. When the gaming ended is unknown.

Economic-business gaming simulation 4: this gaming was developed and conducted from March, 1944. When the gaming ended is unknown. This economic-business gaming simulation tried to have linkages with the policy-economic gaming simulation of the Japanese Total War Institute.

Economic-business gaming simulation 5: this gaming was developed in July, 1944. Whether the gaming was conducted or not is unknown. The gaming was designed to include about 60 players, dividing them into six teams.

Unfortunately research into the above gaming simulations is still in the initial document retrievals stage.

### REMARKS FOR FURTHER RESEARCH

From a theoretical perspective, I should point out that what the first and second gaming simulations differ in is whether they use discrete or continuous simulation. If changes occur as a series of discrete events; there is or can be some causal relationship between events. If changes happen in a series of continuous events; there is or can be an unexpected amplifier between events. This is a tentative conclusion any gaming scientist can draw.

This paper is not only a historical review on the first Japanese national policy-economic gaming simulation and the first Japanese economic-business gaming simulation, but hopefully can also provide some useful bibliographical references for further research into the early history of gaming science. Both gaming simulations were not for educational use, but rather of a research and practical orientation. Since I started to read carefully and in detail the record of the proceedings of the International Military Tribunal for the Far East (Tokyo Tribunal), in particular, numbered 100 and 101 dated 1946, I have been forced to rethink the true beginnings of gaming science. I now believe that war gamers involved were more interested in the war game aspects, rather than those of a social game so that they placed an emphasis on the more usual topics of war games. As a result these first social games, at least in Japan, have

been ignored by both historical research and current academic lore. Unfortunately this research into the existing records is a time-consuming task and worse can never be completed because almost all materials relating to these games were routinely incinerated or otherwise lost with Japan's defeat. The major literature sources, and probably the most reliable, are the proceedings of Tokyo Tribunal. Most materials relating to Ayukawa Yoshisuke's gaming simulation cannot be found in the record of Tokyo Tribunal, as he was exonerated of war crimes charges. Those materials returned from the International Prosecution Section are now retrievable for mostly historic research. Much more materials on the Japanese gaming simulations may be available in English, probably in the custody of the American National Archives and Records Administration in Maryland.

Further research into this history would contribute to the story of the evolution of gaming theory into a science and further to promote to establish the recognition that the gaming discipline is a major social science.

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