February 1983

Teldok

Reference Document C

Office Automation in Japan

Reported by

SCANTECH
SCANDINAVIAN TECHNOLOGY TRANSFER

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PREFACE

This report surveys office automation trials in Japan, and was compiled in November, 1982, by Tadashi Andoh and Andreas Odermatt at the Tokyo Office of Scantech, Scandinavian Technology Transfer.

The report was commissioned by TELDOK. Initiated by the Board of the Swedish Telecommunications Administration, TELDOK aims at documenting and distributing, at an early stage, experience related to the business use of novel telecommunications systems, in particular to office automation. The TELDOK Secretariat is with the Corporate Planning Staff of the Telecommunications Administration, and the TELDOK Editorial Board is presented at the back cover of the report.

Reports sponsored by TELDOK should be suited to a large, primarily domestic audience, many of whom might well be non-specialists. In spite of this, the timeliness and scope of this report merit its swift publishing, unabrigded and in English. The circulation is limited, as the report in its present format is intended chiefly for reference use by Swedish libraries. Eventually, the report will be translated and edited to appear in a Swedish-only volume which will also report on office automation in the US and in Western Europe, drawing on two more reports already published or to be published by TELDOK.

Bertil Thorngren
Chairman, the TELDOK Editorial Board

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This report consists of four sections.

In the introductory section an over-all picture of the Japanese OA environment will be presented, giving readers a feel of the present level of development in Japan.

In the following section on Voice Recognition brief information is provided concerning the status of voice recognition in Japan. Here, further inquiries are invited for an in-depth study of technological developments currently in progress in Japan.

As is evident from the statistical section provided thereafter, under the heading "List of firms and organizations...", voice recognition and synthesis are considered to hold great promise here in Japan.

The final and major part of the report comprises a number of case studies.

SECTION 1: Introduction.

Before moving on directly into our report, we introduce you to the results from a report released by the Japan Office Automation Association this year. Under the title "1982 Office Automation Status Report", it presents a statistical analysis of the present OA situation in Japan based on the results of an enquete sent out to over 2000 companies both listed or unlisted on the Tokyo Stock exchange. It is interesting to note that only 270 companies replied to the survey which began in 1981 and was compiled in February, 1982. The results which have been translated by SCANTECH are as follows:

A Office Work Efficiency

1. A revolution in office work is desperately needed with the steady decline in the number of blue collar workers contrasted by the rapid increase in the number of white collar workers.
2. With the increase in office work capacity and the necessity of improving processing quality and speed becoming urgent, a structural reinforcement of office work itself is necessary.
3. Improvement of office work does not correspond to the increase in office personnel.
4. There are presently no specific work analysis methods or measurement guidelines for improvement and diagnostic purposes.
5. The present layout of offices is based on conventional management applications. Layout should be changed to achieve optimum efficiency.
6. The biggest problem with office work improvement is the fact that it is nearly impossible to grasp its effects.

B Office Automation

1. The most frequent respose to the question WHY was that "the company has to improve productivity in the office, to reinforce competitiveness more than ever before".
2. The common understanding of the meaning of Office Automation is "the comprehensive reorganization of conventional computers and office equipment such as facsimile, word processors, personal computers, etc., to be combined to achieve increased efficiency.
3. The common philosophy behind OA investment turned out to be "to invest reasonably and rationally after grasping the present working volume and capacity".
4. The promoting body (group) behind OA is most frequently members arising from, or the former EDP or Systems Department.
5. The study process in preparing and in introducing OA consists of collecting catalogs, explanation by the dealers, and short "courses" from outside sources.
6. The target area for OA is centering around basic office work which is to slowly start widening to encompass work functions of divisions and departments as a whole.
7. OA is frequently expanded into a company-wide drive or "movement".
8. The order in which the industries have recently installed or strengthened is as follows: 1. facsimile, 2. personal computer, 3. Japanese word processors, 4. on-line terminals, 5. office computers.
9. OA equipment that industries are planning to introduce next in order of their popularity is as follows: 1. Japanese word processors, 2. personal computers, 3. On-line terminals, 4. office computers, 5. on-line work stations.
10. OA equipment desired to be introduced in 10 years time: 1. voice input, 2. large capacity electronic file, 3. optical network, 4. electronic mail, 5. color copy.

11. The main problem in the promotion of office automation is the necessity to standardize and unify office work.

C Office Work Efficiency Index

1. The number of indirect labor is increasing every year, and it has presently reached 40% of the total number of all labor. (indirect labor = workers not directly related to production or manufacturing of goods)
2. Workers working for head offices amount to 18% of the total.
3. Indirect labor cost is 36% of the total labor cost.
4. Office machinery investment per office worker amounts to ¥65,000/year (excluding computer rental).
5. Telephone expenditure per office worker a year is ¥200,000 including on-line (communication) costs.
6. Postal expense per office employee is ¥50,000/year.
7. The total average computer rental fee per office worker head amounts to ¥180,000/year.
8. Office space when averaged out per office worker amounts to $32m^2$.
9. The number of file cabinet units per office worker comes out to 1.3 units.

As it can be seen from the above results, rationalization is not taking place with machines leading the way, but rather an effort to rationalize the human factor is comming first. This fundamentally QC oriented concept will help in the popularization and promotion of OA in the future.

It can be generalized that Japan has still not reached the OA Age yet. It can be said that they are now standing at the gates and preparing themselves to enter. This is actually no exaggeration in view of the fact that 80% of

all personal computers that have been bought are asleep on the desks and tables of the users. Following this statement, the example of OMRON (as given later in the report) is a good case. OMRON, although a rather advanced company in terms of switch production and information systems, introduced numerous personal computers with no specific purpose in mind except to get their employees familiar to their use and operation. This in reality is not a bad case in which a company just wanted to try something new, but a case in which the company had enough vision to see untapped potential in the possibilities of OA, and did not want to limit the potential by establishing rigid guidelines and applications. Rather, they took the time for their employees to grasp what potential personal computers have in store, and to make them come out and be put to use in the most natural manner. They firmly believe that true OA for them comes at a later stage.

It is true that many Japanese companies still do not clearly understand the meaning of OA and how to apply them to their own companies. However, on the other hand, such companies such as Pioneer, C. Itoh & Co., Mitsui Co., etc., and other such international trading companies are far more advanced than the rest. Many of them are already at the stage of developing their own local networks. Niigata Engineering even goes further in trying to develop their own type of local network - both software and hardware - because they have already come to the stage where they have realized that for their applications, commercial ready-made networks do not fit and are too expensive for them to use. They felt that such ready-made networks require rather big compromises on the part of the user, and in actuality not all that universal to fit all the needs of the different companies.

Another major problem here, is the fact that OA means different things to different companies. This is another proof that OA has not really started on a mass scale here. Some companies defined it to us as integrated office equipment including the use of the host computer, while others defined it as independent pieces of equipment such as their fax machines. Even within the same company, definitions can be different depending on the person we ask. The following report leaves the definitions as they were presented by the responsible in charge that have replied to our questions.

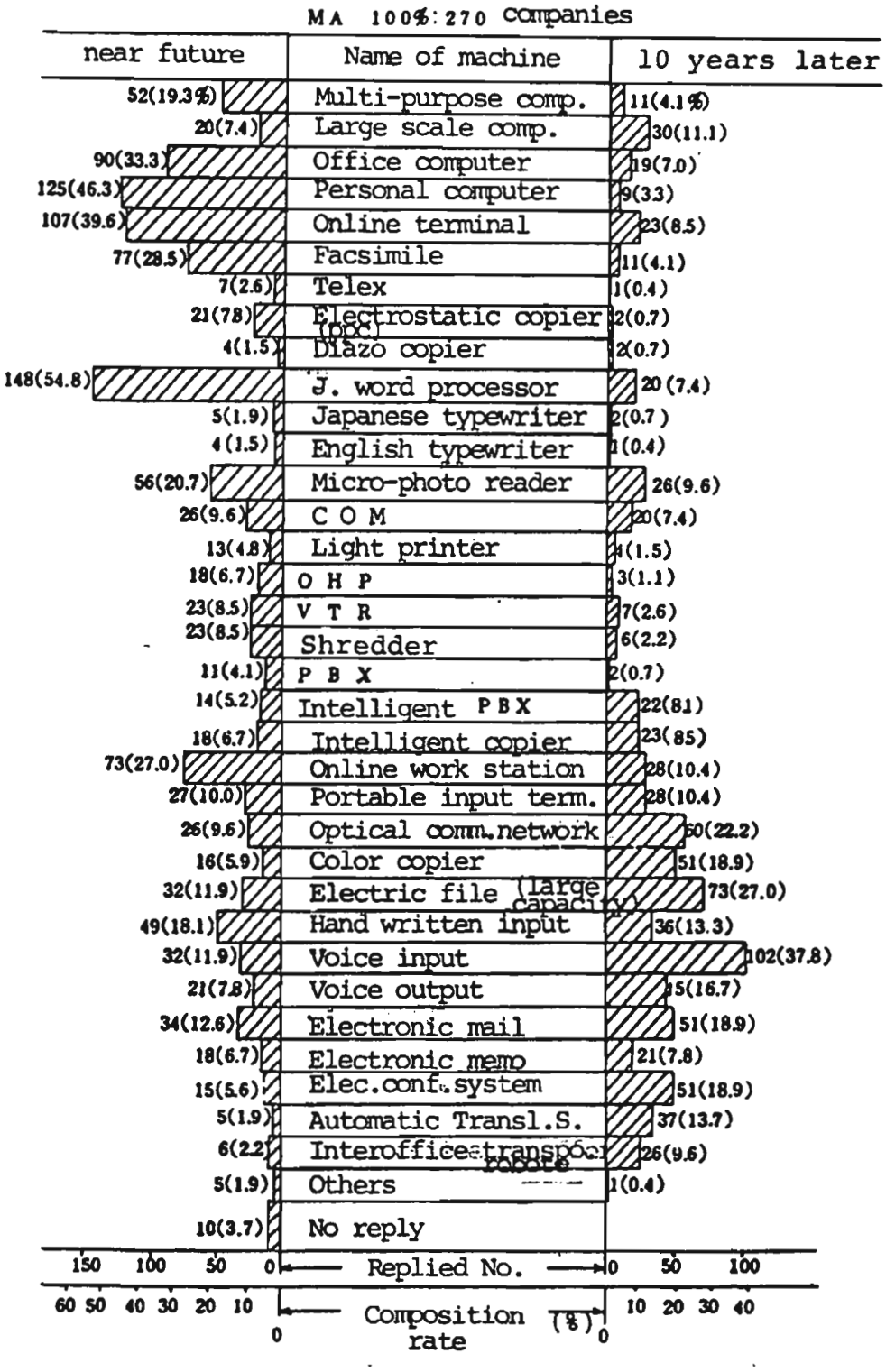
The last but not the least problem we have faced, or rather, the industries are facing, is the fact that there are no measurement standards for clearly grasping the effects of OA. We feel that this is more of a global problem. We have therefore attached statistics from the Japan OA Promotion Association that we believe, when compared with our independent reports, will enable readers to better understand the present status of OA in Japan.

The final section attached is our reply to your enquiries concerning voice recognition. It is very brief, however we believe it serves its present purpose. The subject by definition requires an independent report which can be provided from SCANTECH Tokyo.

As final comment from the authors of this report, we feel it very important to stress again the importance of the fact that Japan never was a "type" country where the typewriter would be used in academic and office environments just as one would write a hand-written letter. Japan is therefore still at the stage where the "keyboard allergy" first has to be cured in order to progress further in the future. We have read American reports noting the existence of keyboard allergy even in the United States within the late-

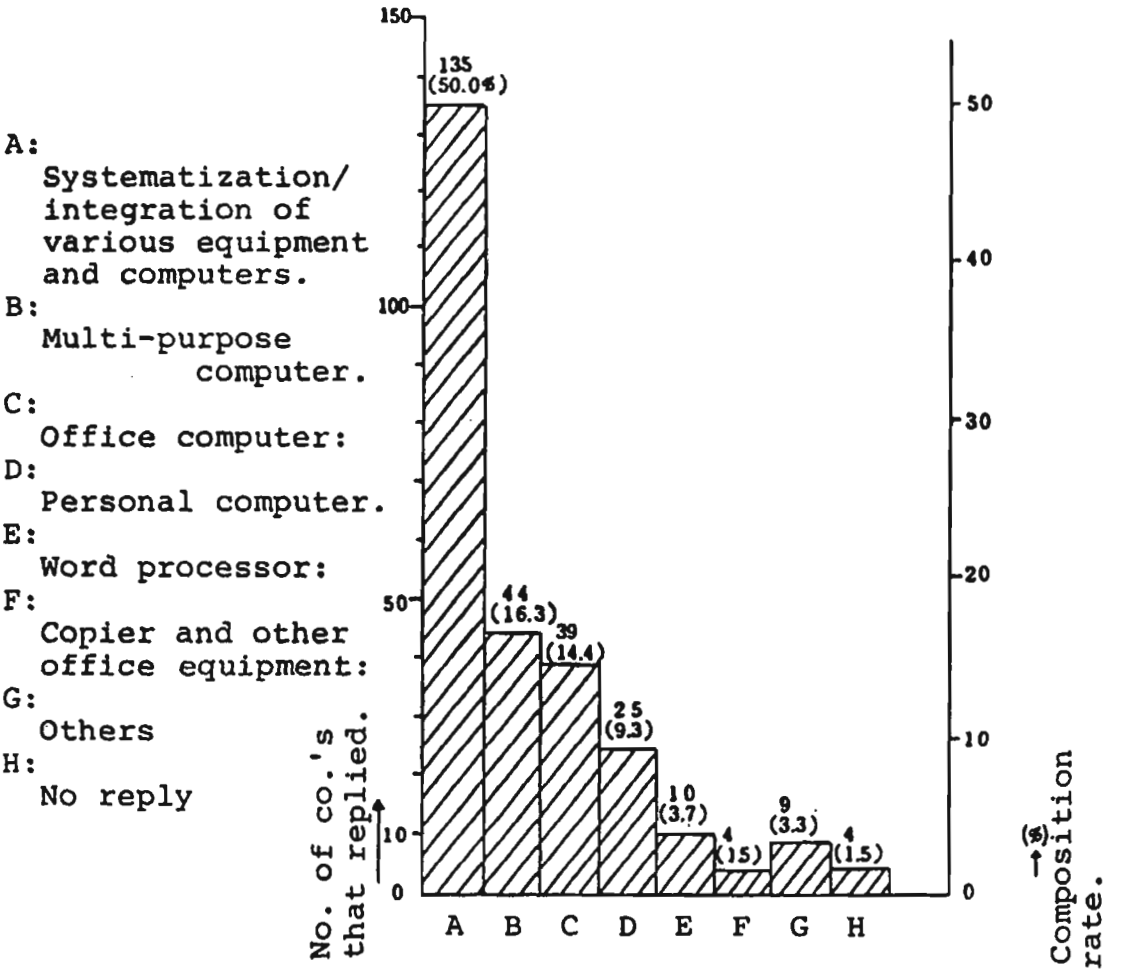
middle and older age management stratum. This was explained as the availability of typists and other secretarial staff in their office environment. Under such circumstances, it is only natural to think that the "allergy" symptoms must be much worse here in Japan where no such "typewriters" existed to begin with.

OA Equipment to be introduced in the future.



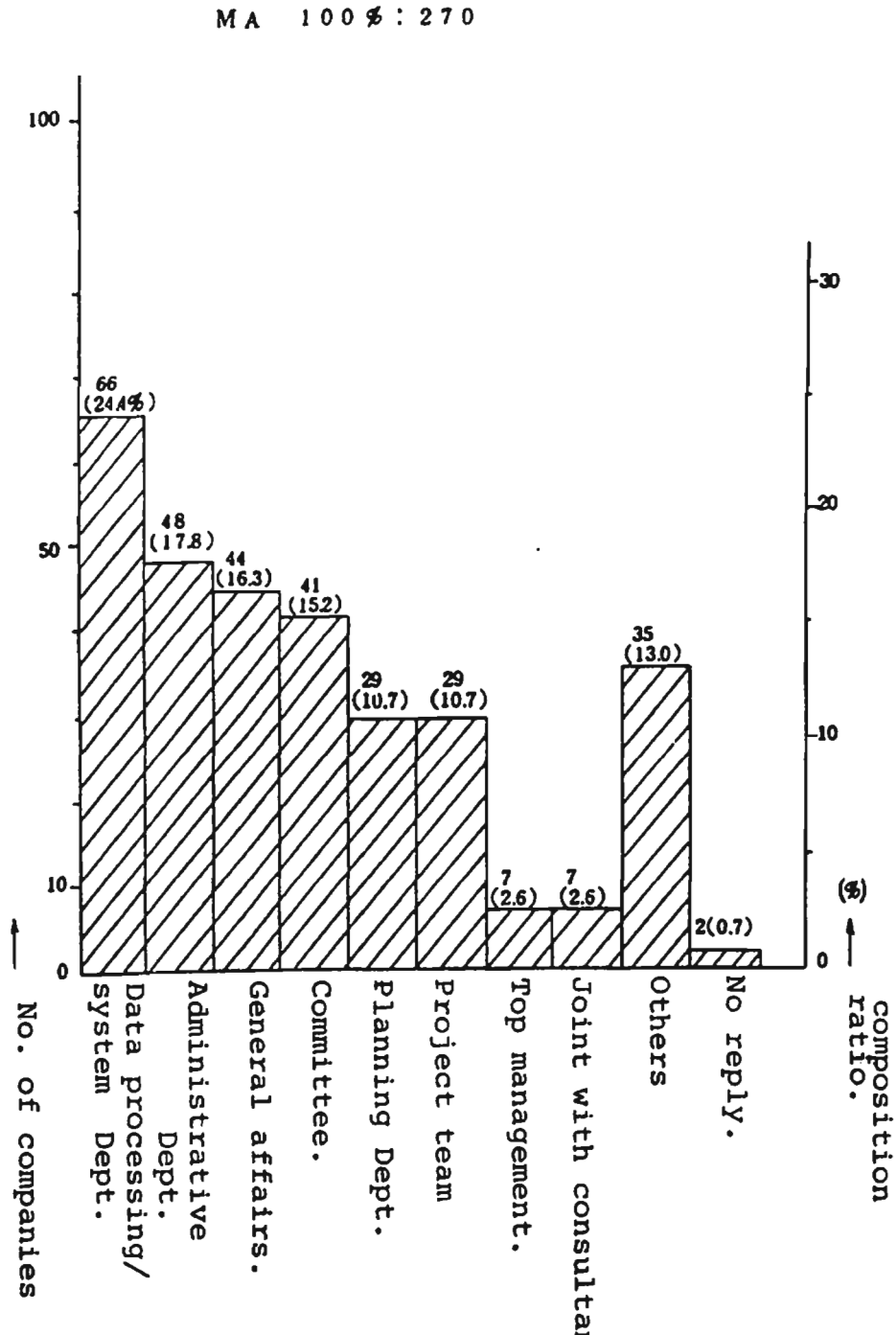
Central equipment in their OA

270 Co. = 100



	agriculture, fisheries, mining.	foodstuffs, chemical.	machinery, electric. metal.	other mfg.	wholesale, retail.	finance, insurance, real estate	transport, communication services.	Total
	%	%	%	%	%	%	%	%
B	15.8	16.3	13.3	13.1	19.4	20.0	7.1	19.6	16.3
C	26.3	8.2	6.7	13.1	16.7	10.0	28.6	17.4	14.4
D	0	14.3	20.0	6.6	8.3	3.3	0	15.2	9.3
E	10.5	4.1	0	6.6	2.8	0	0	2.2	3.7
F	0	4.1	0	0	2.8	0	0	2.2	1.5
A	31.6	49.0	46.7	54.1	50.0	63.3	50.0	39.1	50.0
G	0	2.0	6.7	4.9	0	0	14.3	4.3	3.3
No. of comp.s that replied.	19	49	15	61	36	30	14	46	270

Office automation promotion responsibility

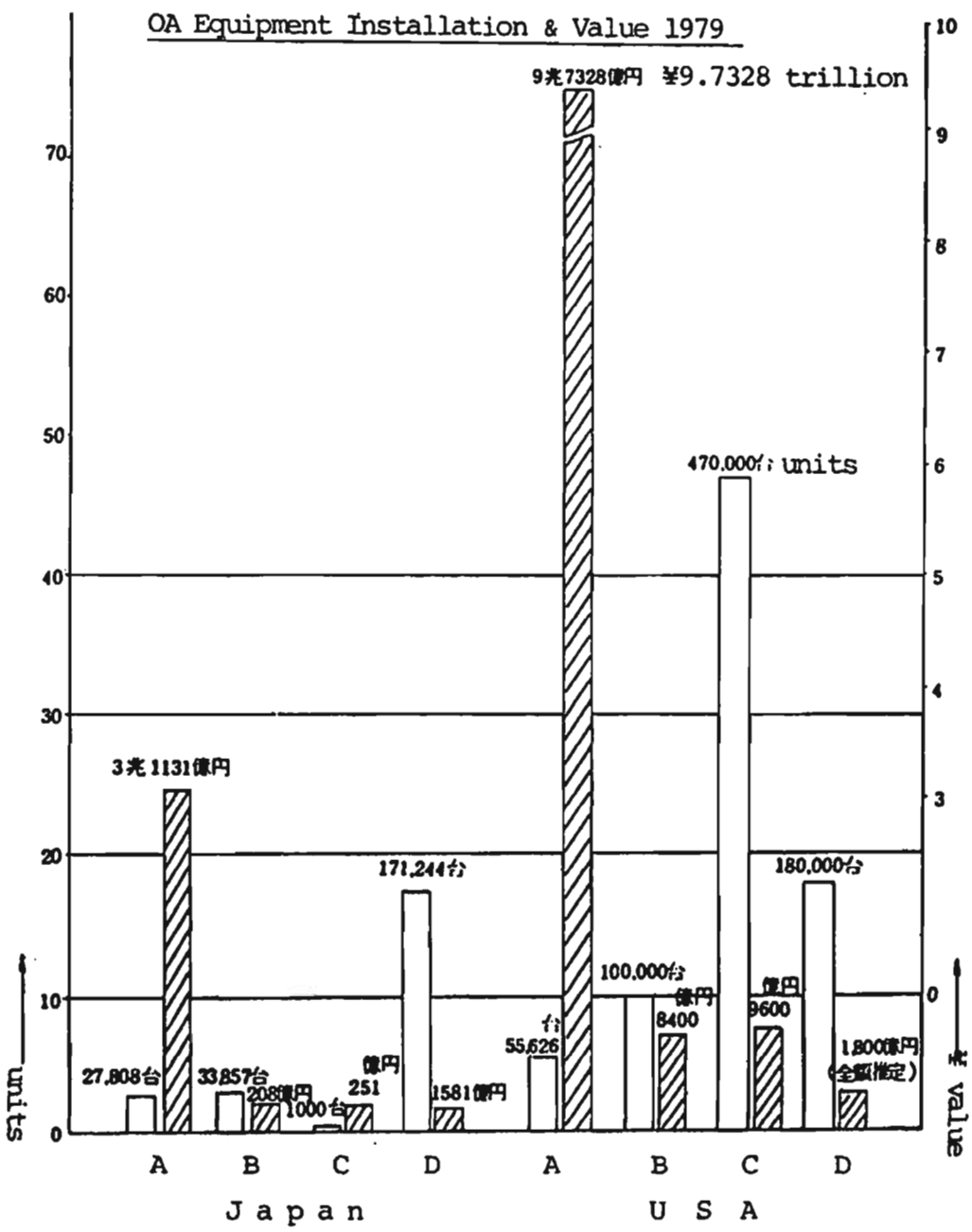


A: Multi-purpose computer

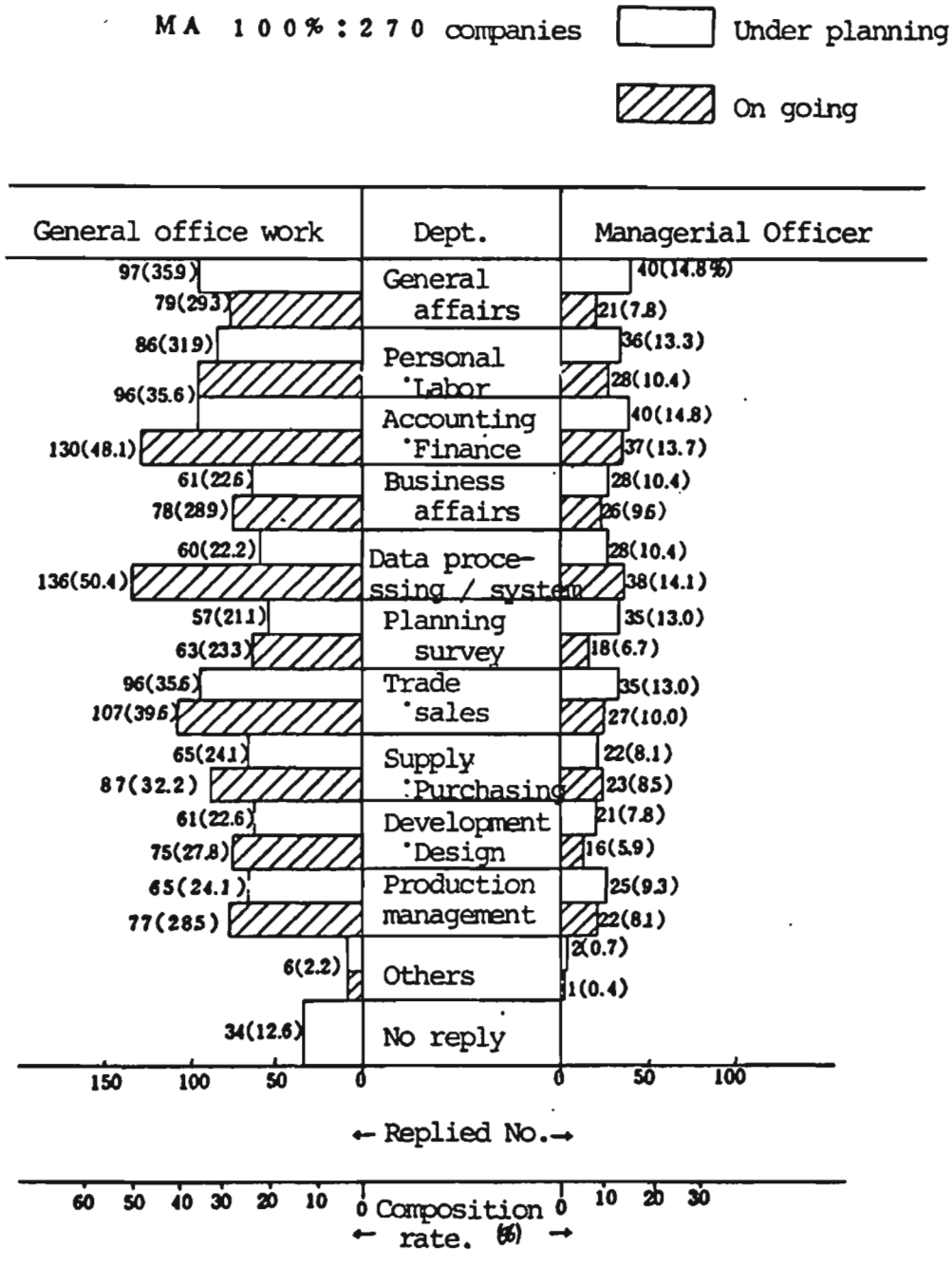
B: Small business computer

C: Word processor

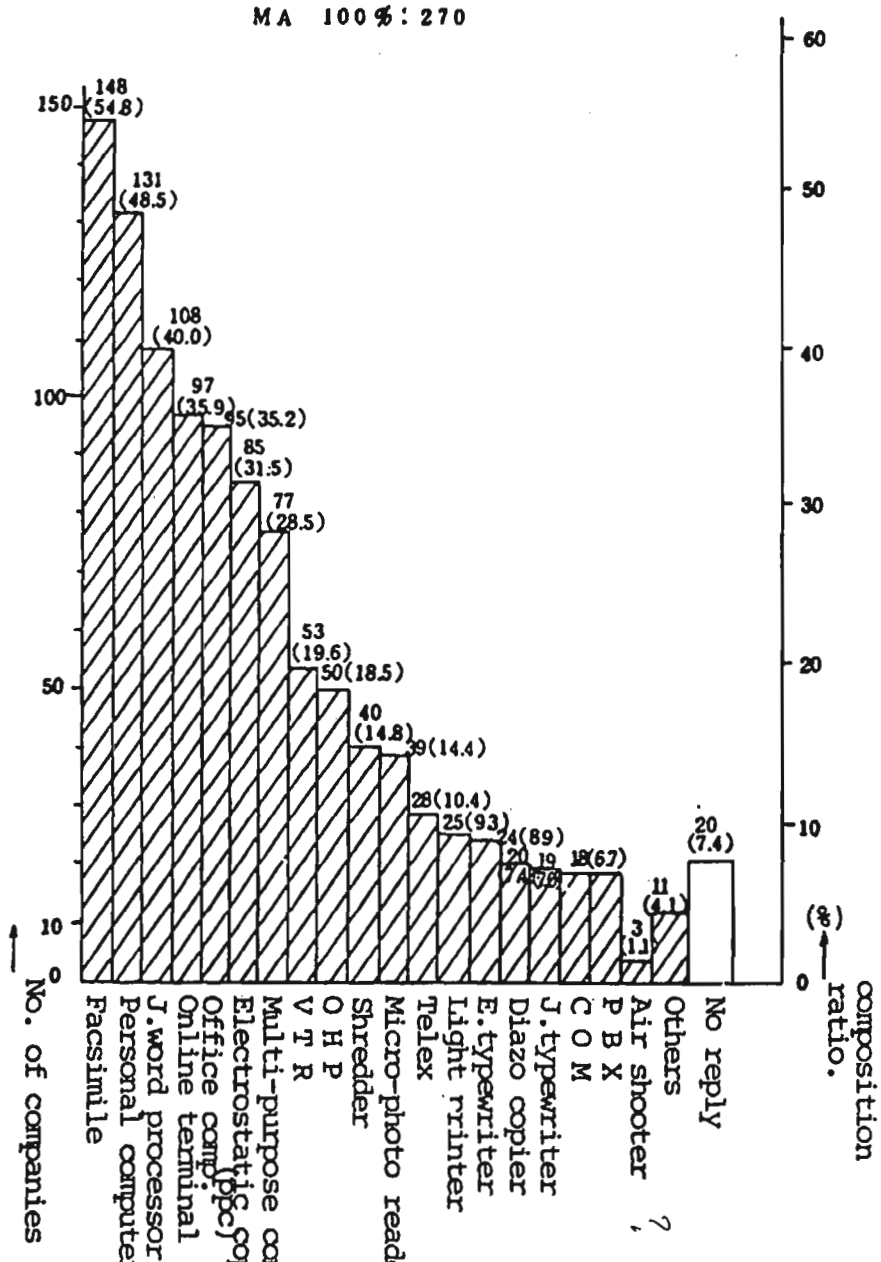
D: Facsimile



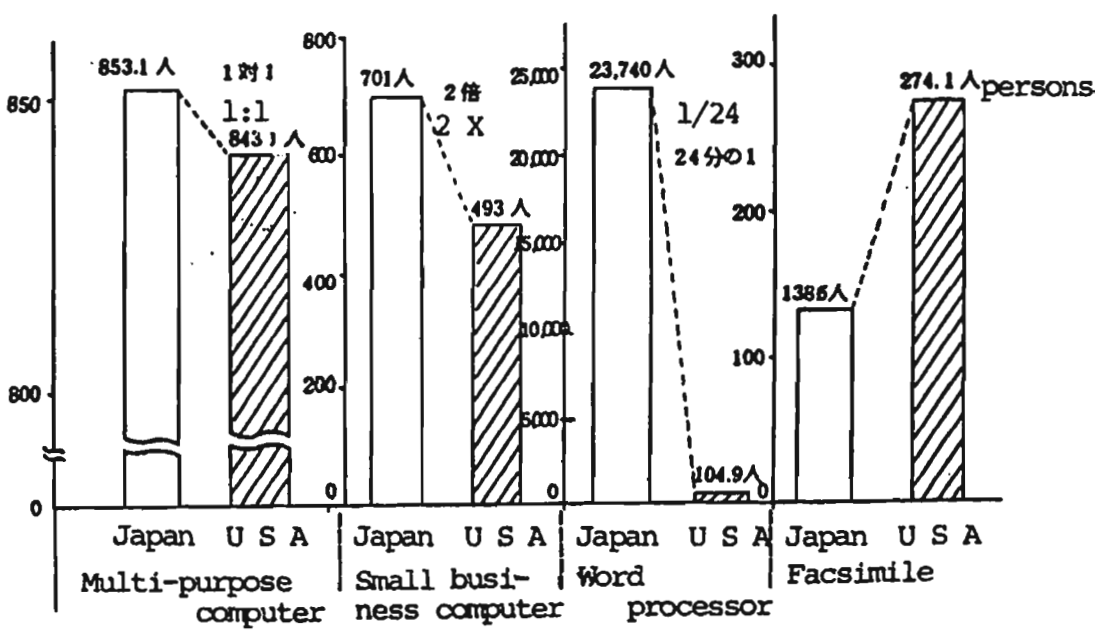
Objectives of OA



Recently Installed/Added OA Equipment

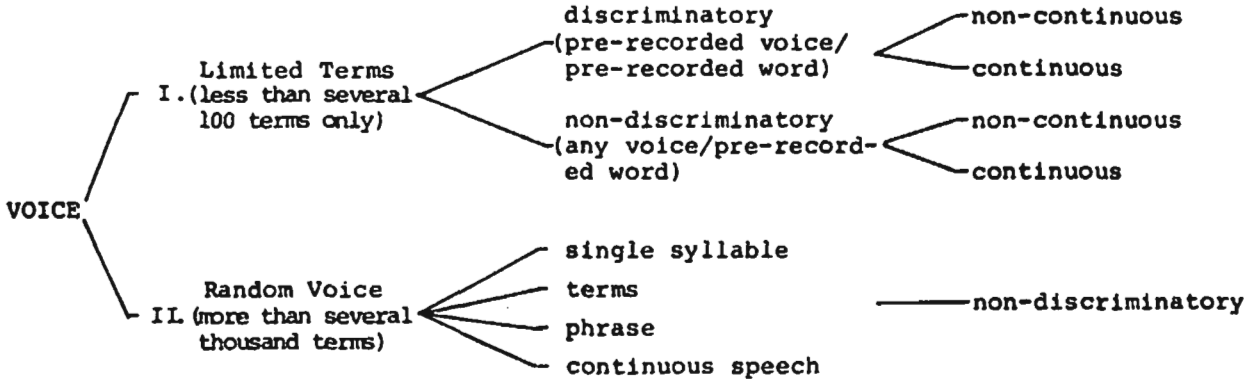


No. of White Collar Workers per Unit of OA Equipment



SECTION 2: Voice Recognition Technology

VOICE RECOGNITION Technology can be categorized in the following manner:



In Japan, random voice recognition has not yet been developed to any significant degree, just as it hasn't anywhere else in the world. For this report, focus will be placed on limited term voice recognition, both the discriminatory and non-discriminatory types.

The discriminatory voice recognition already had found practical use 2 years ago when a company called Sanki Engineering and NEC collaborated in developing the Voice Recognition Sorting System. This system realized sorting (addressing and separating) by voice rather than the conventional 10-key or OCR systems. (see appendix 1.)

A typical example of the non-discriminatory recognition system is the application to banking found here in Japan. It was first applied to practical use by Sumitomo Bank in March, 1980, for notification of account holders of bank transfers into their accounts. (NEC SR-1101)

Mitsubishi Bank has since also begun using a similar application using the SR-1201 - balance reference system. Kyowa and other banks have now also started using systems as the above for such applications.

N E C SR-100 SERIES:

SR-1101	4 words	recognizable
SR-1201	16 words	"
SR-1301	128 words	"

Non-discriminatory voice recognition has since been put to many other applications such as for various reservation applications, for placing different types of orders, etc. Furthermore, NEC was the only company that was involved in this field until recently. However, Toshiba and NTT have recently also entered into the picture.

BANKING AUTOMATION (BANK OA)

The first generation, so to speak, of banking on-line systems began in 1965. The second wave came in 1974, and is presently still on-going. However, the 2nd on-line system is now coming to the end of its lifetime after 8 years of operation. Naturally, the systems have been up-graded continuously and become extremely complicated. Such systems evolve step by step until a new concept comes into the picture. This new "concept", or the 3rd generation of on-line systems, must accomodate all the existing OA equipment and also must leave room for new developments that can be expected in the future such as image processing, Japanese information processing, paper-less systems, digital signal applications,decentralized data processing, and voice recognition.

Another interesting aspect of OA in banks, is their voice applications to their services. We are often disturbed, amazed, and amused at the rapid development in this area. For example, if a person wants to withdraw cash from his account at a cash dispenser in the bank with his cashing card, he will walk up to a little booth where the dispenser is, and confront a little CRT with a drawing of a female employee at the bank on it. The person will depress the button to begin his desired operation (multi-function machine allows cash withdrawal, input, balance check, transfers, etc., both with the card or with the bank book). The lady will then start to be animated on the screen, and lead you through the operation both vocally and visually. She will make a courteous bow and conclude with a "thank you". This is only a voice output application.

Another banking OA example is the automatic call system. This system uses both voice input and output. This bank service is a subscribing service, meaning that the customer must give permission to the bank. What it essentially is is a telephone notifying service telling account holders that there was a transfer into their accounts from someone.

The system telephones the customer, and states:
---"This is the XXXX Bank, transfer notification service."
The customer is supposed to state his or her code:
---"Zero" (eg.)
If her pronunciation is different or unique to a conventional "Zero", or if the voice is different, the systems asks:
---"Please say it again"
The customer can repeat up to 3 times. If she cannot "convince" the system within 3 times, the system states:
---"Thank you very much, we will call back again later".

If the customer wants to have a better security factor involved, the system can be used in parallel with a push button system in which the customer has to punch in another code for the system to continue. However, this requires the use of a push-button telephone on the part of the customer.

If the system accepts your identity, or in other words when you have been positively identified, it continues. It will inform you of the transfer categorically:

---"Checking account no. XXXXXXXX, transfer from XXXXXX, Mr. XXXXX (or organization name), on XX/XX/82, for the amount of $1000. (etc.)

Since the voice is synthetically reproduced, the customer (listener) must be fairly skilled or experienced in listening to such kind of voices. If the customer wants to listen to it again he states:

---"9" (pronounced ku)

...And the system begins again.

When the process is over, the customer repeats his code as a signal for finishing and also as an identity reconfirmation.

---"Zero"

The system replies:

---"Thank you very much"

The system is not all that popular here yet due to the difficulties in comprehending the synthesized voice and the difficulties in answering the system.

We have enclosed together with this section an internal report concerning the first voice recognition application in Japan from NEC and Sanki Engineering as promised earlier.

Internal SCANTECH report: (1980)

SANKI KOGYO Parcel Sorting System

Please understand the complete system as a system with three component parts.
1. sorting machine (Sortrac)
2. feeder (interphaser)
3. VIS

Before going on, bear in mind that the Sortrac, is merely a sorting machine. The sorting machine Sanki has used to establish the systems concept is the SORTRAC, made in USA. The VIS, was developed in colaboration with NEC (Nihon Denki). The PAT is owned by Sanki, but they need approval from NEC. The feeder is completely Sanki's. There is no problem with PAT. Initially, this was all there was. It was Sanki's idea to develop a systems concept involving all three parts to create a complete, systemized, flow machine that can accomplish the work that had originally taken much work and time. Therefore, it is not the hardware- but the software or the technology of combining the three is what Sanki developed. This combination brought about high speed sorting; eliminatated human error; saves time, manpower, and money. Also, by using the spare or unused functions of the built-in computer or a separate memory function, data such as how many, where, date dispatched, (records) of the parcels can be taken automatically.

Now let us proceed to determining how each of the functions interrelate. We will take it from no. 3 upwards.

The VIS (Voice Input System) is a system in which the work of sorting to determine the destination or route of delivery, formally done manually, can be done by a simple word. This is basically a computer which distinguishes the word by use of an oscillograph. The word determines the destination of the parcel (destination - which exit on the sorting machine). The same word has to be reset into the VIS in about one month because repeated use of the same word often causes the pattern to change (eg. if the word right;rahiht, is used continuously for a month, it will become something like rah/i) this is because the operator becomes so familiar with the word and start deviating from the original pattern recorded by the computer.

Now the VIS was developed together with NEC therefore Sanki has to get permission from them although Sanki themselves own the PAT. Now, for selling and Know How or Licencing, NEC gave them the permission. But for the maintenance, there might be some problems because they are using a NEC computer.

As soon as the word/command is given by the operator, the VIS distinguishes and differentiates the word and controls the speed of the feeder/interphaser (2). This interphaser regulates the speed and spacing inbetween the parcels and sends them off to the sorting machine. This interphaser was developed by Sanki alone.

Finally, the parcels reach the sorting machine where they are separated according to the designations of the feeder. The sorting can in theory be done by any sorting machine - it doesn't have to be the SORTRAC. But the problem is, it has to be able to operate at high speeds - or else the whole concept of the "high speed sorting system", and the feeder and the VIS is of no use. The whole systems concept was developed to produce a high speed sorting system. As to the possibility of hooking up a Swedish sorting machine to the other two, here again, it is theoretically possible. But, the function and the operational philosophy must be studied first. Then the VIS and the feeder must be adjusted to adapt to the sorting system. Sanki told us that they are willing to take charge of the engineering for the attachment of a sorting machine other than the SORTRAC. The SORTRAC is an American machine - and information as to whether we will be able to buy it or have it licensed will be given to us in three days (Oct. 8) from Sanki. In any case we are sure to be able to buy it from the American company - but whether directly from the US. or Japan is not certain.

As to your visit to actually see the total system in operation, arrangements have been made by us for you to see it in one of the most famous department stores in Tokyo. The prices and basic terms will also be handed to us on the 8th of October.

S A N K I K O G Y O part 2

(additional information received on October 8.)

VIS:
As stated before, they received permission from NEC. But because it uses a computer, there may be problems if it breaks down. They suggested that at least in the beginning when the order is under ten units, the buyer should buy a spare and use the parts from it if it breaks. Also for repairs, there are a few possible solutions: NEC technicians from GB can be dispatched to Sweden. Service can also be dispatched from NEC USA. Another solution is the training/ education of a Swedish technician by NEC (GB or USA).

FEEDER/INTERPHASER
No problem as stated before.

SORTING MACHINE/SORTRAC

About the SORTRAC, because Europe is extra-territorial of the contract they received from the manufacturers of SORTRAC, It would have to be acquired directly from them. Here is the name and address of the company:

A C C O
Bailes Rd.
PO Box 460,
Frederick, Maryland 21701
USA
phone: 301662 - 4181
Integrated Handling Systems Div.

or

ACCO
929 Connecticut Ave.
Bridgeport, Connecticut 06602
phone: 203 335-2511
Manager, International Development - Mr. Michael J. Coleman

SECTION 3: List of firms and organizations treated in the following section on Case Studies.

This section is a quick guide to the contents of Section 4.

APPLICATION	COMPANY	INDUSTRY	RESPONSIBILITY	MACHINE	TURNOVER	EMPLOYEE	LOCATION	QC	PAGE
1-A. data processing	Madame Hanai	Ladies fashion apparel & items	Computer Room	Yokogawa Hewlett-Packard 3000/30, 3300	¥3.7 bil	220	Tokyo	YES	23
1-B. mailing, accounting, data pro.	Tokei Kenkyu Kai (Statistical Research Found.)	Research foundation	Administrative Section.	SORD M23-MARK III	--------	300	Tokyo	NO	25
1-B. data pro. also terminal to host	Nagase & Co.	Chemical trading co.	Kodak Dept.	IBM System 23	¥495 bil	1,935	Osaka		29
1-B.	OMRON Tateisi Electronics Co.	Mfg. of relays, microswitches & information systems	OA Promotion Center	IBM: 30331, 370-148, 4331 (Level II) SORD M223	¥149 bil	4,769	Kyoto		31
1-B.	Ajinomoto Co.	Mfg. & sales of foodstuffs	Systems & Distribution Dept.	NEC PC-8001 NWP-20N(JWP)	¥374 bil	5,600	Tokyo	YES	33
1-C. data highway with optical fiber	Kawasaki Steel Corp.	Steel mfg.	Office Rationalization Promotion Group	FUJITSU FOPIC 7300	¥1.24 tril	29,432	Kobe		35
1-C.	C. Itoh & Co.	Trading company	Information Systems Dept.	IBM: 3033S(host) 3270(terminal) WANG OIS(terminal)	¥5.2 tril	7,620	Osaka	YES	37
1-C.	Mitsubishi Steel Mfg. Co.	Special steel mfg.	Systems Dept.	Mitsubishi MELCOM 80 series	¥77 bil	2,300	Tokyo	NO	40
1-C. connecting microfilm, voice input, telephone response, image & picture information systems	Tokyo Sagawa Express Co.	Transport		DATAPOINT IPB Local Network	¥50 bil	1,500	Tokyo	NO	42
1-C. picture info. service, program library, electronic mail	Nippon Credit Bank	Banking	Management Information & Survey Room, Planning Dept.	NEC: MS50(host) PC-8001(personal terminal)	¥6 tril (assets)	1,838	Tokyo	YES	44
1-A/B/C.	AIST (Agency of Industrial Science & Technology)	Gov't research laboratories		FACOM M-200(host) plus various terminals	¥31.7 bil (for all activities)	2,839 (researchers)	Tsukuba		46
1-C.	Mitsui & Co.	Trading company	Information Systems Dept.	UNIVAC: 1100(host) MEGAMINI(subcentral) off. terminal OT7000 off. process. OP7000	¥13.7 tril	9,868	Tokyo	NO	50

KEY: 1. COMPUTER A)office computer B)personal computer C)network D)communication E)others
2. FACSIMILE
3. WORD PROCESSOR

APPLICATION	COMPANY	INDUSTRY	RESPONSIBILITY	MACHINE	TURNOVER	EMPLOYEE	LOCATION	QC	PAGE
1-C.	Showa Musen Kogyo Co.	Mfg. of electronic parts	Systems Development Dept.	Mitsubishi MELCOM 80 Officeland	¥31.7 bil	800	Tokyo		52
1-D.	Pioneer Electronic Corporation	Mfg. Audio equipment	International Dept.	IBM 4300 WANG 2200V(WP)	¥268 bil	7,000	Tokyo		54
1/2 synthesized voice responce and FAX	Misawa Homes Co.	Mfg. & sales of prefabricated homes	President's Room, Information Adm.	Hitachi HITAC: M-150H(host) H-1100(voice res.) HF-343X(fax)	¥106 bil	912	Tokyo		56
1-E. portable(handy) inventory control, etc.	Kirin Lemon Services Ltd.	Mfg. softdrinks		CANON HT-3000, EM10 Office Comp.					58
1-E. online computer shopping & cash dispensing	Sogo Shimpan Co.	Credit company	Administrative Dept.	NEC: ACOS 350, cash dispensers		150	Tokyo	NO	60
2. automatic distribution, etc.	Mitsui OSK Lines	Cargo	Information Systems Dept.	Matsushita: UF-215(fax) UF-272(auto. dis.)	¥530 bil	3,574	Tokyo		62
2. vector/raster signal conversion	Nippon Seiko KK.	Mfg. & sales of bearings	EDP Center	Matsushita Image Information Distribution System CF-3400	¥183 bil	7,200	Tokyo	NO	64
2.	Nisshin Steel Works.	Steel works	General Affairs Dept.	Matsushita PANAFAX UF-520 III	¥349 bil	9,184	Tokyo	YES	66
2/3. integrated word processing	Kawasaki Heavy Industries Ltd.	Heavy industry	Kobe Works Word Processing Center	WANG IBM 3033	¥740 bil	25,597	Kobe		68
3.	Kyoiku Co.	Publisher	Management Survey Room	Fujitsu OASYS 100		167	Tokyo		70
3.	Keisen Women's College	Education	Administrative Dept.	Matsushita PANAWORD 1000		240 (teachers)	Tokyo		71
3.	Meidensha Electric Manufacturing Co.	Electric machinery mfg.	SE Headquarters	RICOH word processor series	¥107 bil	5,500	Tokyo		72
1-C.	Niigata Engineering Co.	Mfg. machinery	Administrative HQ	FACOM M-200(host) NEC PC 80(terminal) Fujitsu MICRO 8	¥183 bil	5,162	Tokyo	YES	27
1/3.education of personnel	Marubeni Corporation	Trading company	Office Adm. Dept.	Toshiba WORDPAL 20 BASIC Master Level III	¥10 tril	8,045	Osaka	YES	73

SECTION.4: Case Studies

COM: Madame Hanai

IND: Ladies fashion apparel and items

EST: September, 1950

CAP: ¥90 million

TUR: ¥3.7 billion

EMP: 220

REP: Arai, Manager, Computer Room

APP: Office computer for data processing

MAC: Yokogawa Hewlett-Packard 3000/30, 3300 (from May,1980)

PUR: For invoicing and all other accounting and financial operations, they already were using an NCR computer from 1975.

From May, 1980, they have extended it to total product control using the Hewlett-Packard.

SYS: IMHAPPY (Integrated Madame Hanai's Apparel Product Processing System by YHP3300 computer system).

RES: They have been into OA since 7 years ago. Their assets have expanded roughly 6 fold compared to their foundings. However, the number of employees have not increased in their accounting and inventorial departments. This is their best evidence of efficiency.

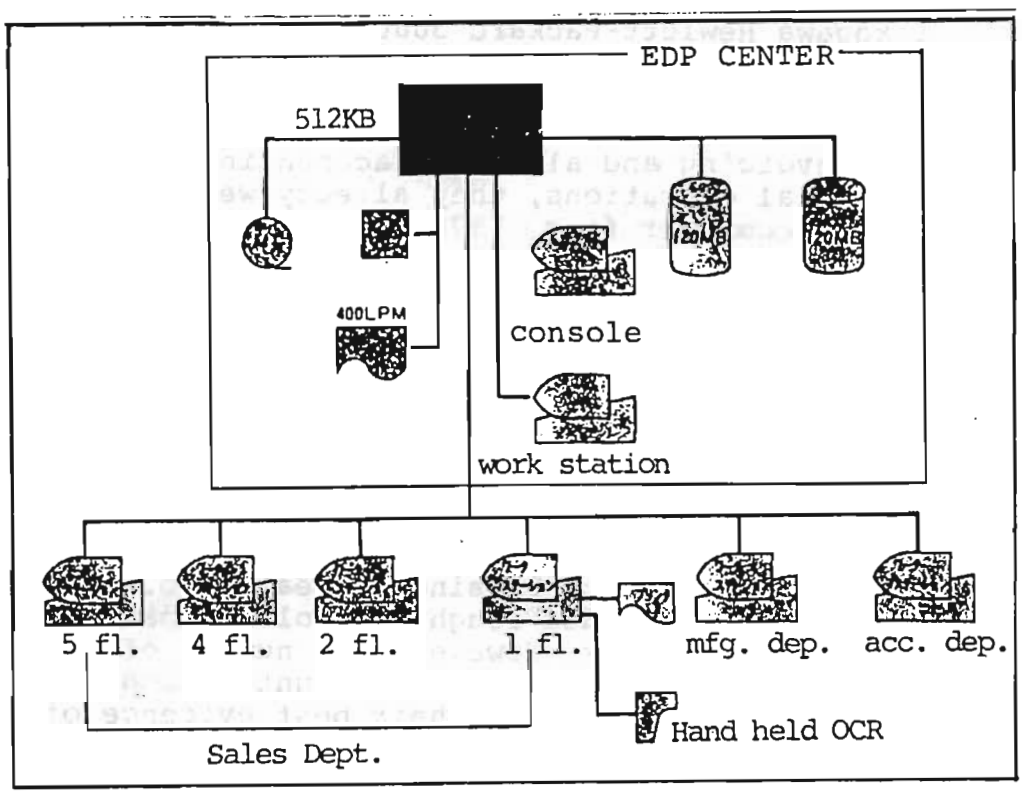
FUT: They are planning to develop a network of all their branches in the future. For the time being, the very near future will see the company

using cassette tapes for inventory data collection.

Another interesting area they are presently looking into is a system that will allow the designer's imagination to become realized on screen and print. On the same line of thought they are interested in CAD/CAM applications for their industry. They are planning to invest ¥50 million in this area and begin development in 2-3 years.

BUDGET: The cost for the first 4 units of the YHP3000 was ¥45 million and ¥20 million for the software (including the man-hours spent by the employees away from the company trying to develop soft-ware together with a soft-ware company).

QC: The founding motto of the company was "let's all make better goods" - which is basically what QC itself is.



COM: Tokei Kenkyu Kai (Statistical Research Foundation)

IND: Research foundation

EST: October, 1947

CAP: Founding donation: ¥200 mil.

EMP: roughly 300 research members

REP: Kenji Miyamoto, Section Manager, Administrative Section.

APP: Mailing, adressing, accounting, etc.
Applications to less complicated research.

MAC: SORD M23 - MARK III

PUR: Rationalize clerical work.

SYS: A typical personal computer line-up - with 2 mini diskette drivers.

COM: Presently being applied for accounting and mailing (addressing) purposes. The foundation has a very wide range of activities ranging from statistical research to distribution of various magazines and books within their field of research. They also contribute frequently to such publications, and even publish their own journal. Furthermore, they even go on to handle some of the accounting for such publications they handle. In the wake of such diverse and time-consuming operations, addressing and accounting took up very much of their time. The computer is now basically put to use to alleviate such clerical inefficiencies. Their large - scale host computer is reserved for pure scientific research. However, some of their research and analysis do not require such large systems, and may even become more complicated to use them. For such projects, the SORD PIPPS (non-programming) system is very handy, and allows even non-specialized clerical staff to perform formerly complicated tasks and calcu-

lations.

RES: Increased efficiency. No figures were made available. Another specific factor the foundation mentioned to the authors was the fact that ever since the application of such personalized systems, much of the work was standardized into formats allowing even non-experienced or new female clerical staff to perform many operations. They mentioned a case of an experienced female worker who got married and left the organization, leaving behind a maze to be conquered by new personnel.

EVA: No formal evaluation process seems to have taken place.

FUT: They would like to increase the volume of research to be handled by such smaller computers instead of their larger host. They plan to install a larger version of a PIPPS compatible computer next year exactly for this reason.

BUD: ¥ 1 million

QC: None

COM: Niigata Engineering Co., Ltd.

IND: Integrated manufacture of machinery with emphasis in diesel engines.

EST: June, 1910

CAP: ¥16.17 billion ('80)

TUR: ¥182.626 billion ('80)

EMP: 5,162 ('80)

REP: Administrative Division, Administrative Headquarters.

APP: Discontinued use of mid-range computers to be replaced by a large host computer linked to a network of personal terminals.

Develop a comprehensive fax network

MAC: host: FACOM M-200

terminal: NEC PC 80
Fujitsu MICRO 8 130 units

near future install FACOM 9450

PUR: "J - Project"
- Drastic reduction of present computer use cost, handwritten letters and documents, and computer print-out expenses.
- Realize the Niigata Communication System (NCS) to reduce their office running cost to 1/4 of what it is now.

SYS: Personal Network (PN) and NCS.

They are planning to add the FACOM 9450 line of 16 bit personal computers to their personal terminal network. They will within a year link all the personal terminals in a local optical fiber network creating the PN and NCS.

RES: Since they have established their J Project Promotion Committee, they have been holding a promotion conference inside the company every 3 months. During this time, 400 new software programs have been created, of which 22 now run as the core system inter-linked to each other. The core program now run all facets of their activities, from planning to delivery.

More than 400 employees are now familiar with BASIC. They also use public subscriber lines for their fax and data communication, leading to a decrease of 10 and a few million yen cost in communication and other clerical expenses during only half a fiscal year.

The company had 4153 types of documents all together, of which 80% was formerly handwritten and the rest in form of computer print-outs. With the initiation of this program, they managed to eliminate 400 types of documents which was roughly 10% of the total volume. Furthermore, 1453 types of documents which is 35% of the total is now accessible and "documentable" (can be created) on CRT's, and 830 types or 20% can be created by use of the personal or large computer terminals. Finally only 35% of the former total volume or 1470 types of documents still remains to be handwritten.

They expressed their philosophy towards this effort as a challenge to achieve FA in the office, rather than a mere QC effort.

FUT: First of all, they plan to firmly establish the concept and program they have initiated. They also plan to 'humanize' the process as much as possible trying to achieve a closer relationship between workers and OA equipment. They want to bring about a realization that information is a visual resource.

As stated earlier, they have plans to develop an optical fiber network. A test project is going on with a commercially ready-made network. However, it has turned out to be so expensive and the fact that they have to start out with software all over again, is getting them rather discouraged. They have already made decisions to keep full-scale installation of the system pending (while still keeping on the trials)and develop their own original network.

QC: As stated above. Also, they have computer education courses 3 nights a week open to anybody in the firm.

COM: Nagase & Co.

IND: Trading company specializing in chemicals.

EST: December, 1917

CAP: ¥5.724 billion

TUR: ¥495 billion

EMP: 1,935

REP: Ohnishi, Assistant Manager

APP: Stand-alone computer applications and as terminals to host.

MAC: IBM System 23

PUR: For use in their Kodak Dept.
To increase administrative efficiency and increase productivity with related departments.

Since a sales department's basic work lies with the needs and demands of the clients who are obviously located outside of the company, it was the company's policy not to standadize to any large extend which would many times limit the possibilities of a specific division or department.'We wanted to leave a lot of room open for everyone'.That is basically why they installed host-compatible units for stand-alone applications.

SYS: System-wise, they are on a diskette system because they are basically used on a stand-alone basis. However, the units are linked to the host IBM.

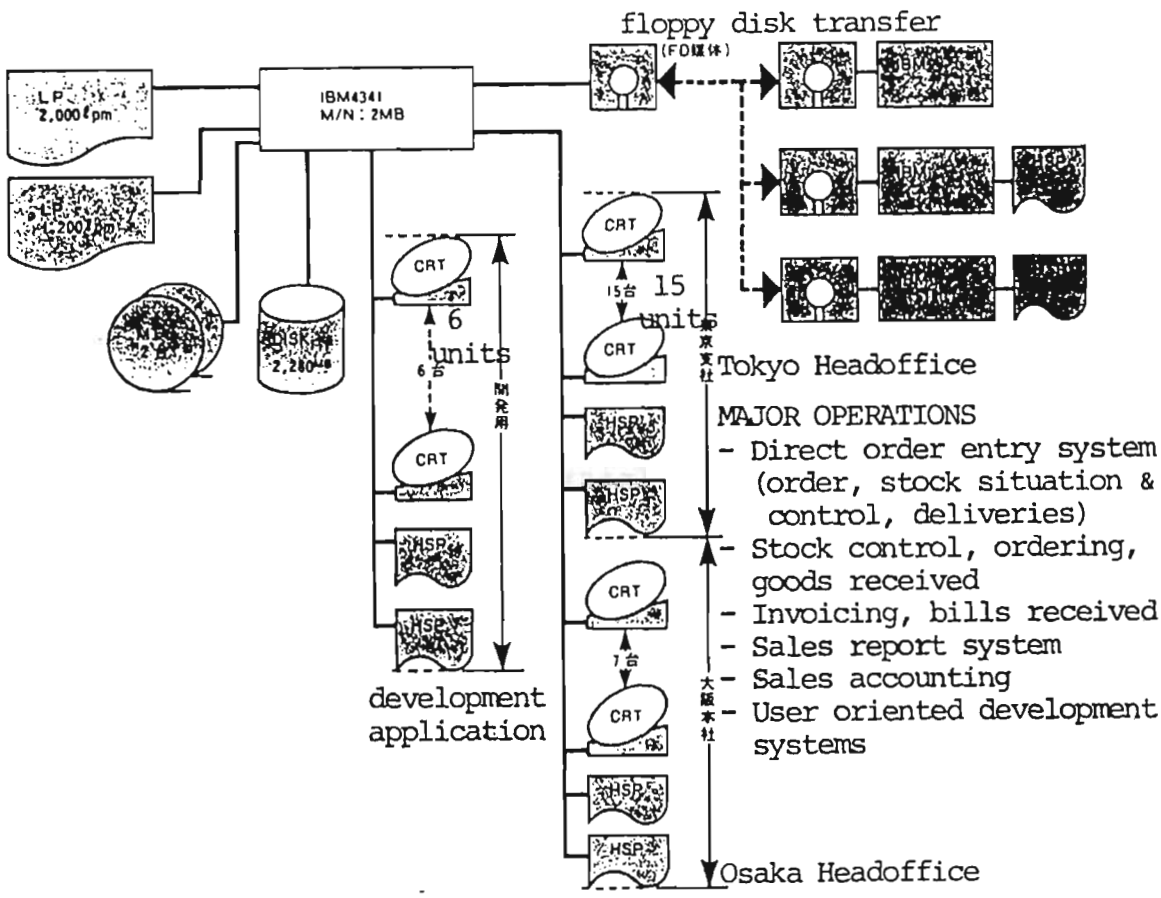
They are, however, very careful in terms of registration of new clients - especially when clients concern more than one division. They are also very careful concerning document duplication. They expressed their concept as follows, "Although we basically believe in the stand-alone system, harmony of the company comes first."

"That is basically why we link the system to our host IBM".

RES/EVA/FUT:

- Introduction of word processors are necessary
- The link - integration with the host computer - is vital at the actual work-level
- Such information-processing tools as word processors, PC, FAX, etc., should be integrated besides clerical computing applications.

Kodak Product Div.



COM: OMRON Tateisi Electronics Co., Ltd.

IND: Manufacture of relays, microswitches and information systems.

EST: May, 1948

CAP: ¥6.016 billion

TUR: ¥149.022 billion

EMP: 4769

REP: OA Promotion Center

APP: Personal computer utilization to business

MAC:
- IBM 3031 (1 unit)
- 370-148 (1 unit)
- 4331 (Level II) (2 units)
- the bulk of the personal computers consists of SORD M223 series

PUR: In May, 1980, the director's meeting decided on a theme: "1000 Personal Computers Introduction Plan". By April, 1981, they had installed 315 personal computer units within 8 of their offices, 16 branches, 33 sales offices, and 5 factories.

When they first intorduced the plan and the hardware, they had no definitive plans as to how and what to apply them to on a macro basis. The concept behind was basically to get the company employees used to computers so that when the real wave of OA comes,or rather when the real age of computerization comes as the manager put it, the personnel will be ready for it.

At this point one and a half years since its conception, the number of units have increased to 500.

SYS: No concrete systematization

RES: The company is not specifically interested in the results in terms of absolute figures. They are, however, very proud of the fact that over 2000 original programs were made within the first 6 months of installation. The breakdown of the various programs are as follows: administrative 45%, production related at 20%, R&D related at 18%, and sales oriented programs at 17%. Another point the company mentions is the fact that 2000 persons within the company can utilize these units at the work level, and over 600 people (at that time after the initial 6 months) could compose programs themselves in BASIC.

In June of 1982 they started a program registration system which will soon be changed into what is going to be called "Soft Registration Bank".

COM: Their basic concept towards intra-company education of personnel can be expressed as trying to generate enthusiasm in all levels - up-down bottom-up - all branches of the organization. They call this concept the UOLX.

The company put their direct results as follows:"If each of the over 2000 programs our employees created was put a price tag of ¥100,000, we would have a software capital of at least ¥200 million".

FUT: Their UOLX concept is still at the very primary preparation stage. They believe that it is just a stage to prepare the way for the real OA, where machines will function as the hands and feet of people and men will be left with with being creative and innovative as their function.

BUD: The number of units of personal computers installed has increased to about 500 units after 1 1/2 years of initiation. They claim the costs to be in the several 100 millions. Their monthly estimated lease payments amount to about ¥15 million.

COM: Ajinomoto Co., Ltd.

IND: Manufacture & sales of foodstuff

EST: December, 1924

CAP: ¥18 billion

TUR: ¥374.3 billion

EMP: 5600

REP: Hiroshi Kawabata, Manager, Systems & Distribution Dept.

APP: Rationalization of routine and clerical work directly within work area.

An educational step in applying them in the future as an strategical management tool.

As terminals to the ACOS system 1000 (host computer)

MAC: NEC PC-8001
NWP-20N (Japanese word processor)

PUR: Increase efficiency
As a strategic management tool

SYS: 2 reasons were given as selecting the PC-8001.
- the host is a NEC
- the most popular personal computer presently available, and the most application software available.

RES: An average of 1 unit per division has been achieved. All accounting work of the various product division which formerly took over 2 days to accomplish have been reduced to around 3 hours. Simulation is also a frequent use. The initial target of having personnel getting used to sophisticated OA equipment has been achieved. Another important achievement

was the drastic increase in clerical efficiency that followed. No specific figure on this was ever prepared.

COM: The company was very satisfied in their decision of introducing personal computers. They reported an increase in the time available for meetings and discussions.

EVA: No formal evaluation process has taken place yet.

FUT: Grade-up in the use, and development of OA equipment fit for the various needs of the independent divisions.

BUD: First year ¥50 million 50% for hardware and 50% for software. From next year they plan to decrease to 30-20 million yen.

QC: They have activities very similar to QC going on. However, they mentioned it strictly as something beside OA, and that OA was not thought of as an extention or spin-off from QC.

COM: Kawasaki Steel Corporation

IND: Steel industry. One of Japan's 5 biggest steelmakers.

EST: August, 1950

CAP: ¥134.424 billion

TUR: ¥1.24 trillion

EMP: 29,432

REP: Office Rationalization Promotion Group

APP: Data highway system

PUR:
- Developed the system in preparation of the coming OA age.
- Absolute reduction of documentation/weight of paper.

SYS: Fujitsu "FOPIC 7300" optical fiber system

For the time being, they have installed 50-70 display and printer units.

EVA/RES: The following are some of the intersting results that followed after implementing the system.

- They have managed to reduce their paper documentation by 156 tons all together.
- Following the above, they have established a a new filing system yet to be released to the public.
- They have installed floor ducts on every floor of their new building in preparation for expansion of their system in the future. There they will install high and low voltage lines along with other communication lines (telephone, etc.)

- They have presently already completed installing this optical data highway between the 17th to the 30th floor of their new building.

FUT: To advance and complete the system to encompass all order-purchasing activities, accounting and financial activities, financial simulation and modeling, personnel administration, technical calculations and information access, and finally to promote all other facets of business activities through an on-line system.

BUD: They spent roughly ¥200 million for the floor ducts only (3 types of lines).

COM: C. Itoh & Co., Ltd.

IND: Trading company

EST: December, 1949

CAP: ¥37.251 bil.

TUR: ¥5.2 tril.

EMP: 7620

REP: Information Systems Dept.

APP: Communication between terminals and host computer.

MAC:
IBM 3033S	host
IBM 3270	terminal
WANG OIS	terminal

PUR: To begin with, they established the Information Systems Dept. in October, 1978, basically composed of 2 older departments and having a personnel of about 200. During the 3 years following, the number has decreased to 70% of the total.

The next target was to combine and integrate 500 computer terminals and 500 communication terminals to achieve a "one-dimentionalization", or integration of data and word processing.

Genrally speaking, Japanese general trading houses spend ¥200 - 500 million yen a month and 200 - 400 people for computer operation. C. Itoh, however, has only about 100 now, and they believe themselves to be quite advanced in that sense. Their final target is a totally paperless office environment.

SYS: COSMICS (C. Itoh group Organized Strategical Management Information Control System)

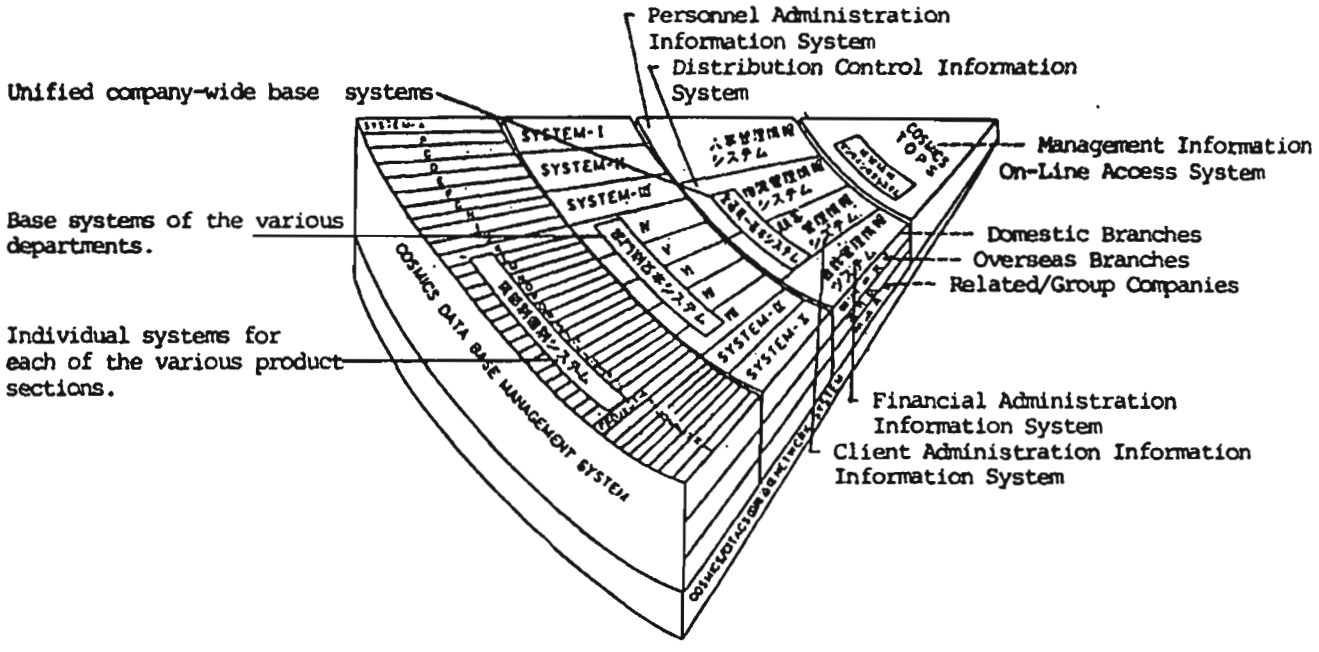
The company began preparations for this system already in 1971, and by 1975 their target and plans had been laid out. Their target to integrate word and data processing and create a central computer file system under the name COSMICS Data Base Management got under way. And another important subsystem to the grand COSMICS is the CITACS which connects 135 domestic and international outlets to a central base in Tokyo. With these 2 sub-systems - the filing and International network, the plan to realize a totally integrated paperless office environment.

RES:
- Paperless conferencing using TV and VTR has been realized although it is not computerized yet.
- They have put great efforts into developing an inter-industry/company network which will link all of their major clients on an on-line basis. It takes roughly 3 years until one client company is completely linked on an on-line basis connected onto the comprehensive network. By the end of 1982, 7 companies will be linked by such a network. For these companies, there will be no documentation for all practical commercial purposes. All letters, orders, receipts, invoices, etc., will all be processed electronically making the whole process far more efficient and speedier. A rather striking example of this is the case of their textile division. The division is fairly large with a personnel of about 1000. The division was reduced by a 100 persons with the onset of the system.

COM: They put the concept behind their OA as follows: "If today's OA is called points dispersed as sand on a sheet of paper, tomorrow it will be connected into a line segment, and the day after tomorrow into a complete plane".

FUT: They are very careful in their expansion. As expressed above, they feel that even the very best discrete systems will never be a match to a total integrated system.

QC: They proceed OA and QC in parallel to each other.


Personnel Administration Information System
Distribution Control Information System
Unified company-wide base systems
Management Information On-Line Access System
Base systems of the various departments.
Domestic Branches
Overseas Branches
Related/Group Companies
Individual systems for each of the various product sections.
Financial Administration Information System
Client Administration Information Information System
SYSTEM-I
SYSTEM-II
SYSTEM-III
COSMICS DATA BASE MANAGEMENT SYSTEM

COM: Mitsubishi Steel Mfg. Co., Ltd.

IND: Manufacture & sales of special steel

EST: November, 1949

CAP: ¥2.7 billion

TUR: ¥77 billion roughly

EMP: 2300

RES: Systems Dept.

APP: Develop a computer network between the head office, branch offices, and factories.

MAC: Mitsubishi MELCOM 80 Office Computer Series.

PUR: The company formerly employed billing machines at five of their branch offices which were linked to the head office's computer center via public network. They have replaced them with the above computers and extended installation to all 11 of their branch offices. They hope to achieve drastic rationalization of clerical work.

SYS: The hardware has been expanded to include online terminals at each of their 7 automobile parts supply depots.

RES: Organic use of information was made possible. No actual figures could be provided. However, they seemed quite satified with being able to reach sales and order information from every outlet. Since the outlets themselves have access to other outlet data, storage and manufacturing is drastically rationalized.

COM: They are basically very satisfied with a far more effective use of data. Increased and faster service was also mentioned as a point of great strategic importance.

EVA: No specific calculations or evaluations seems to have been made.

FUT: The systems development in the above case was basically composed and progressing in the following 3 steps:

1. Direct connection of production control, orders, and deliveries. (present stage)
2. Supply parts storage/warehousing control (partly completed)
3. Application to efficient use of management data (sales level, received promissory notes, etc.) budgeting, etc. (partly completed)

QC: They are presently trying to rationalize on a total-company basis. However, they do not call their activities specifically as QC - more rationalization than anything else.

They mentioned that they do not think this (their) case as an example of true OA. They said that they expect to achieve that later. Meanwhile, they are introducing different machines and systems on a case-by-case basis trying to achieve the real OA.

COM: Tokyo Sagawa Express

IND: Transportation

EST: September, 1974

TUR: ¥50 billion

EMP: 1,500

No. of TRUCKS: 1,100

REP:

APP: Local Network IPB connecting:
microfilm systems, voice input systems, telephone response systems, image information systems, picture information systems.

MAC: DATAPOINT
IPB (Internal Process Buss) Local Network

PUR: The transportation industry lives on the motto of FAST-ACCURATE-CAREFULL. Under such circumstances they have brought in OA into the following areas:

1. Work hour calculations
2. Unpaid account collection and processing
3. Cash on delivery processing
4. Personnel and salary processing
5. General accounting

SYS: They have completed development of their own system 3 years ago. Worthy of note is DATAPOINT's expansion potential. The system is continuously being expanded, but the hardware is completely versatile not requiring the company to make any concessions.

The company developed their own HOCR terminal under the name SGW 8100 which can read 43kg of invoices at a time. This can be said to be the core of their rationalization plan.

Another interesting aspect of their system is that they use the telephone numbers of their clients directly as customer codes thereby eliminating one step in the process.

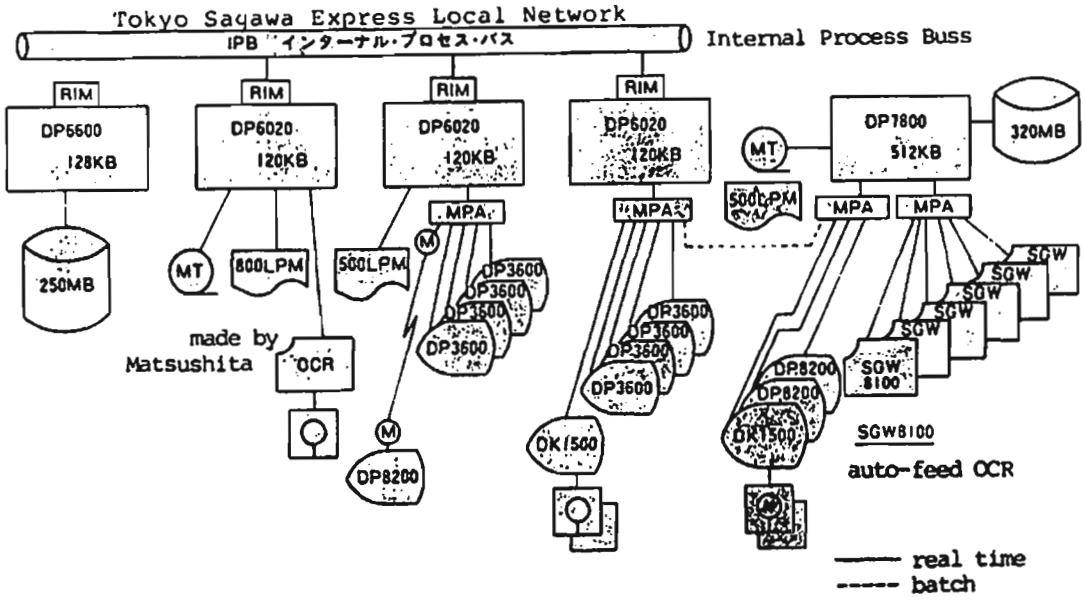
They presently are using 6 units of their SGW 8100 OCR greatly enhancing their rationalization even further.

FUT: They plan to continue expanding the system and to network all their outlets domestically.

They also plan to slowly replace DATAPOINT equipment to NEC in the future. This is because NEC supplies communication equipment for computers. Every truck presently installs a tranceiver for efficient pick-up and distribution. They plan to integrate this communication system with the computer.

BUD: In the case of Sagawa, each of their domestic branches are independent companies, and therefore have their own OA budgets. However, it is known that some of the branches spend as much as 20 million yen a year for OA.

QC: As it was mentioned above, they are planning to establish a local network in the future. They are therefore planning to re-organize their systems which is defined by the group as an QC effort directed towards OA.



COM: Nippon Credit Bank

IND: Banking

EST: April 1957

CAP: ¥78.5 billion

ASSETS: ¥6 trillion

EMP: 1,838

REP: Researcher, Management Information & Survey Room, Planning Dept.

APP:
1. picture information service
2. storage, transfer and exchange of personalized computer programs in BASIC
3. electronic mail.

MAC: NEC MS50 host
NEC PC-8001 stand-alone terminals

PUR: Office rationalization, increase efficiency and the accumulation of information with support potential for sales activities.

SYS: NOAS Nissaigin Office Automation System

1. The center distributes the daily exchange rates to all of their branches (which amounts to over 100 CRT screens). However, the information is not presented merely in numerical values, but presented in a more understandable picture (graph/chart) form.

2. NOAS also has an extended filing capacity which allows the transfer, exchange and storage of programs that individual users create for their specific purposes or for the division, dept., etc. Therefore acces to such programs greatly increases efficiency for personnel sitting down to create a new program - it

may already have been created. He would therefore always start out by first consulting the program menu.

3. Electronic mail dispatched through the NOAS system can be stored for a period of 3 days in an exclusive mini-computer at the computer center.

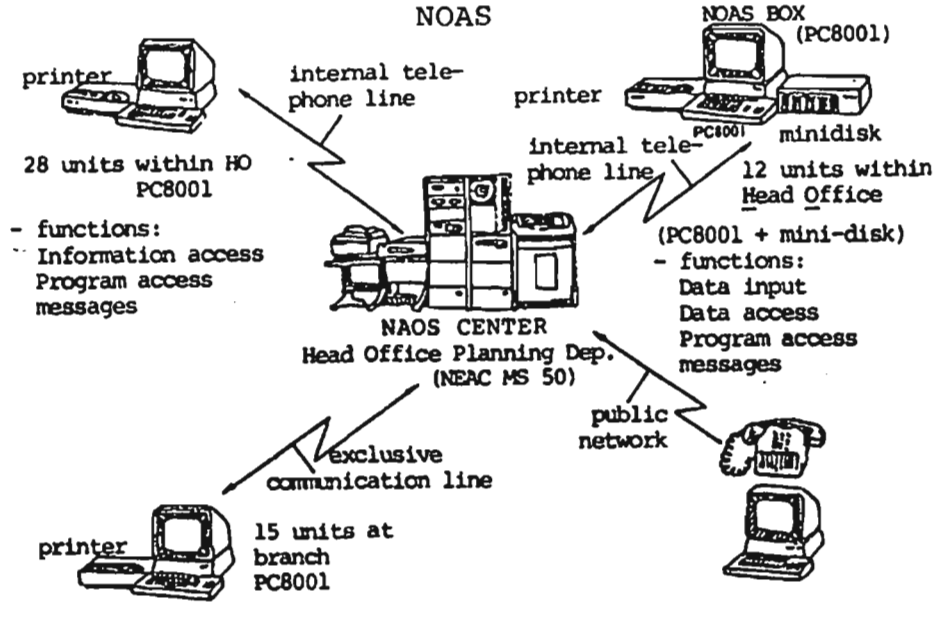
EVA: They are quite satisfied with the results only in terms of the fact that the employees are becoming skilful with computers. They are also presently in the process of reviewing the necessity of OA in industrial management.

FUT: They will finish laying a total domestic network for communication.

They feel as they did in the evaluation section because the management believes that the only thing remaining to a person in the office in the future should be intellectual activities, and should not be bothered by other manual and clerical problems. In that sense, they do not believe OA to be something that can be calculated on a cost-performance basis only.

BUD: ¥100 million

QC: QC already existed as a corporate policy by the time they started this system. An aspect of this effort was the access of appropriate information by executives , rather than the management having to move employees to gather it for them. In more ways than just mere speed and accuracy, the process of access to information was rationalized.



COM: A.I.S.T. (Agency of Industrial Science & Technology) Tsukuba Research Center

EMP: Number of researchers 2,839 (1980)

BUDGET: ¥31.7 bil. (total sum for all institute activities)'80

SYS: "RIPS" Research Information Processing System

The system links the following 9 Institutes with an optical fiber network:

- National Research Laboratory of Metrology
- Mechanical Engineering Laboratory
- National Chemical Loaboratory for Industry
- Fermentation Research Institute
- Research Institute for Polymers and Textiles
- Geological Survey of Japan
- Electrotechnical Laboratory
- Industrial Prodducts Research Institute
- National Research Institute for for Pollution & Resources

"LA" Laboratory Automation
This system although sounds very close to FA, is very much closer to OA in terms of application at the Tsukuba Research Center.

MAC: FACOM M-200 host
various other terminals for:

- batch processing
- TSS
- graphic display
- document retrieval
- image display
- design

PUR:

1. Development of a multi-purpose data highway composed of a large-scale computer and image/ picture station/terminal
2. A network utilizing optical communication technology.
3. Develop a system to promote research activities and the operation of the various institutes efficiently.

4. Automatic operation of the system to conserve energy and improve efficiency.

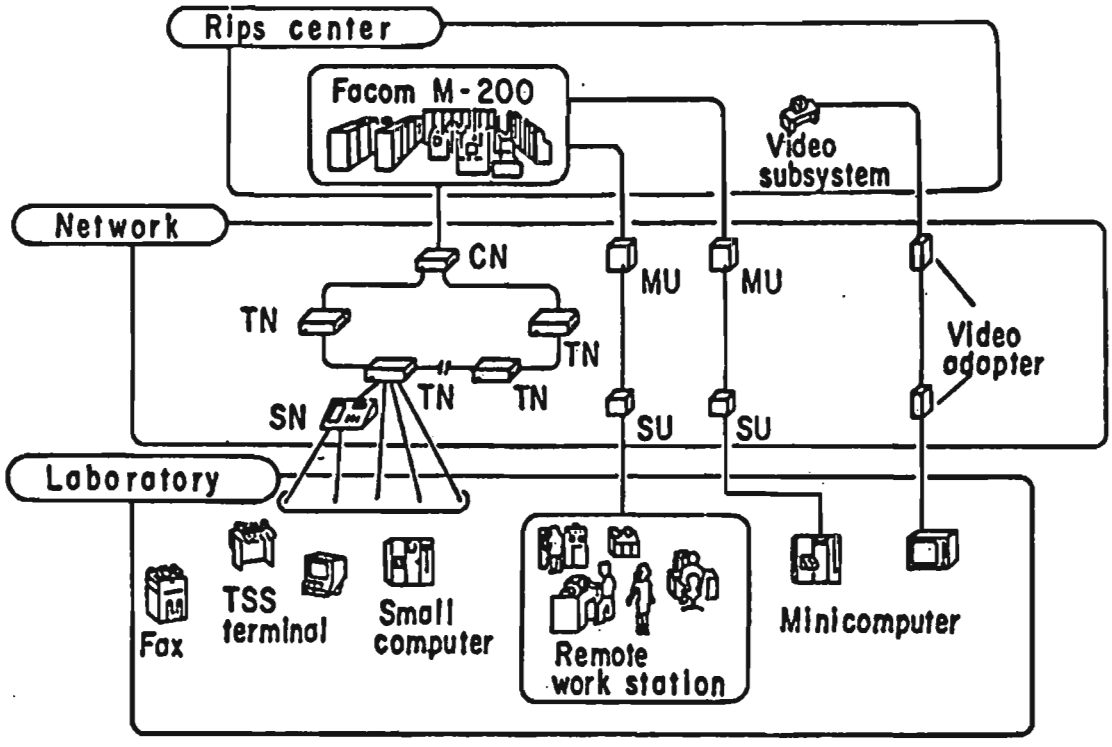
APP:

1. "Innovation Bank" system development
2. "Research Automation" systems development for simulating research and laboratories
3. "Research Support" systems for supporting research directly and indirectly.
4. "Electronic Filing" system (ECF)
5. English-Japanese translation services.

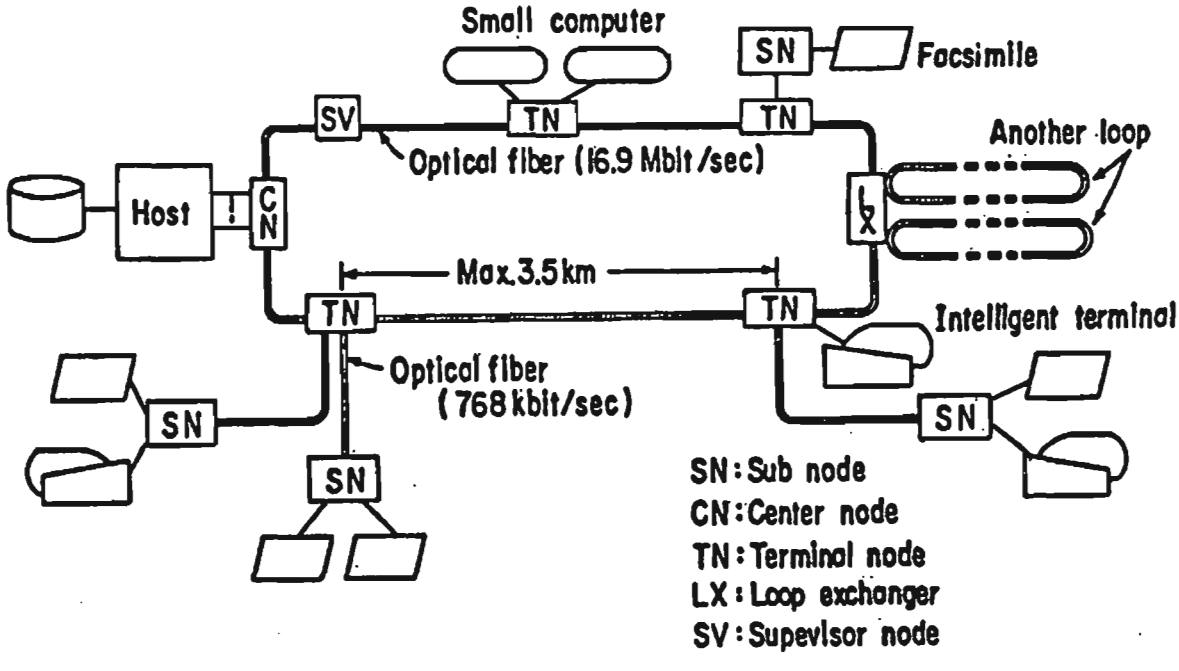
RES: The RIPS has been in operation since 1981, but they are still in the process of brushing-up and improving software and peripheral equipment.

COST:

Yearly rental/lease cost for hardware	¥764 million
Optical fiber installtion	¥854 million
Software development & others	¥155 million
Operation and maintenance of center	¥184 million



The configuration of rips



Configuration of multi-purpose data highway

Scale of rips

	Description
Area covered with network	About 370 acre
Laboratories	9 research institutes About 60 buildings About 3000 researchers
Total length of optical fiber	Over 360 km GI : About 280 km SI : About 80 km
Splicing	Over 500 splicing
Connector (plug and jack)	About 2300
LED	About 550
APD	About 150
PIN. PD	About 400

Scale of network (End of 1980)

Mutipurpose data highway	3 loops including supervisor node : 3 center node : 3 loop exchanger : 1 terminal node : 35 sub node : 196
High speed dedicated network	19 pairs of master and slave units
Video distribution network	10 video adapters and 1 video switcher

COM: Mitsui & Co., Ltd.

IND: Trading company

EST: July, 1947

CAP: ¥48.832 bil.

TUR: ¥13.700 tril.

EMP: 9,868

REP: Technology Development Group, Information Systems Dept.

APP: Online network

MAC: UNIVAC 1100 host
UNIVAC MEGAMINI Sub-central system
Office processors OP7000 (30-50 units at this initial stage)
Office terminal OT7000 (500 units)

PUR: 1. Multi-purpose terminal
2. Integrated control and decentralize data processing
3. Development of simplified computer language

SYS: "ORION" Office Reformation by Information through On-line Network.

This ORION system is basically composed of a 4-stage hardware line-up: the host, sub-central, office processors, and the office terminals.

COM: The ORION system began in 1981, and the first stage came into practical application this August, 1982. The first stage is the application of the host to accounting, all types of billing operations and financial documentation. The Accounting and Financial Departments frequently have over 100,000 such documents arising per day, and it formerly took over 3 days process them. Another important factor behind the deve-

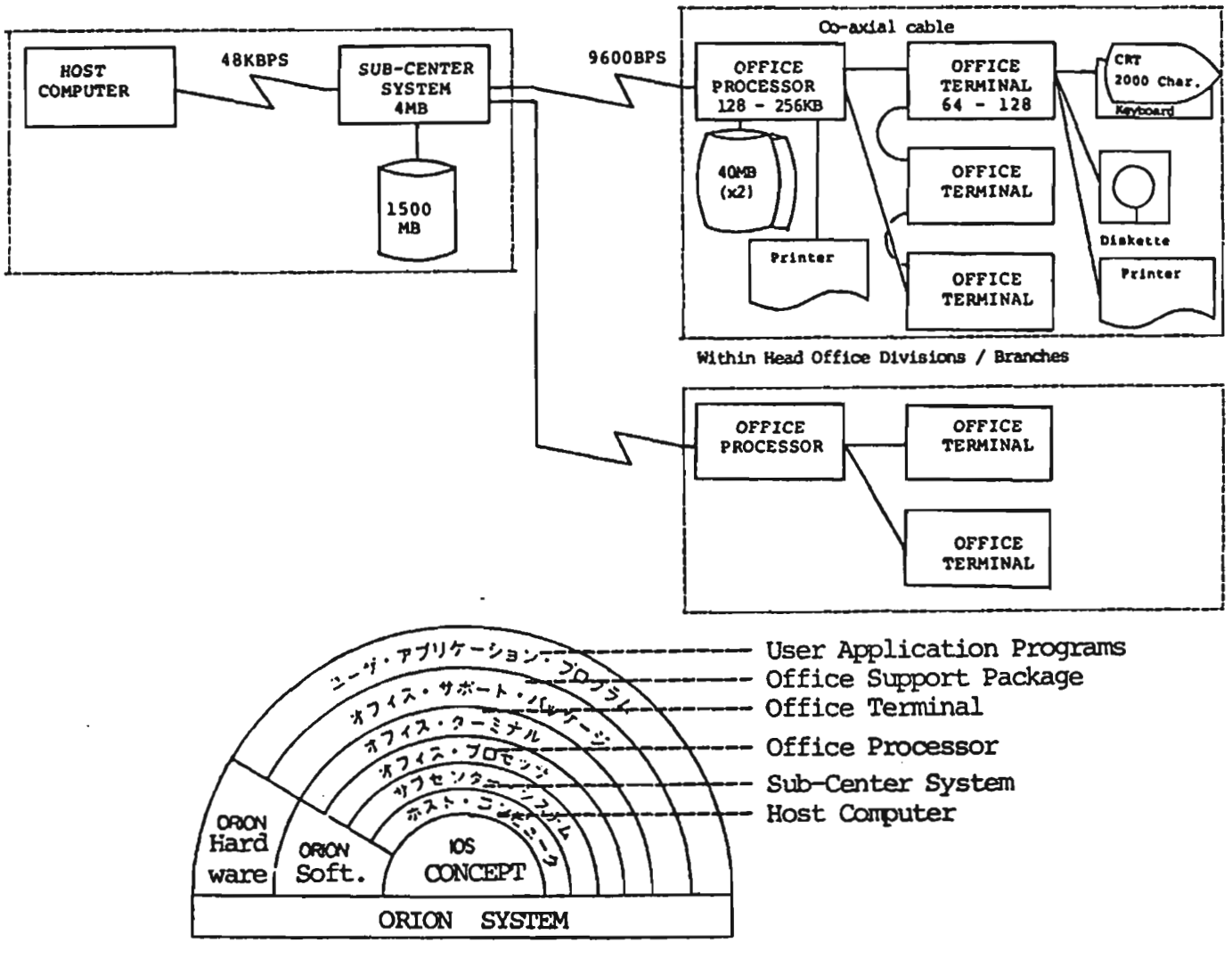
lopment of the ORION was the fact that the company as a whole was at an overflow of un-integrated, basically stand-alone or division/department based office equipment. They were flooded with too much unplanned OA. With the new system, they plan to inegrate all their activities in a single direction to integrate and drastically increase efficiency.

BUD: They refused comment.

QC: They try to insert the QC mentality into the education process of their personnel for computer use.

EVA: No formal evaluation attempts have been made.

ORION HARDWARE CONFIGURATION



COM: Showa Musen Kogyo Co., Ltd.

IND: Manufacture of electronic parts.

EST: January, 1966

CAP: ¥2.25 billion

TUR: ¥31.7 billion

EMP: 800

RES: T. Itoh, manager, Systems Development Dept.

APP: Development of a "total information system"

Effective use of minicomputers, office computers, and personal computers together with their computer room.

MAC: Mitsubishi MELCOM 80 Officeland Series.

PUR: The company manufactures high quality electronic parts for a variety of components including various office automation supplies. All factories, branches, and sales offices are linked on-line with the computer center for access to data processing. This link also provides electronic mail functions, and allows integrated control over order - production - storage - delivery - sales. However, many independent needs of the various outlets began gathering force, and they experimentally installed the MELCOM series at 2 of their branches (1981 installation). The model was used due to its extended memory capacity, and its ability to use Japanese characters.

SYS: The basic development of the system was planned and created by company staff with emphasis placed on the accounting, personnel, and administrative departments.

RES: Rationalization and increased control were achieved.

EVA: No formal evaluation process seems to have taken place. No actual figures have been made available.

COM: Besides the above-mentioned main computer and the introduction of office computers, the company also has installed one minicomputer for scientific research use, along with about 30 personal computers.

FUT: The next step in the company's integration was stated as connecting the 3 types of computers now in use to develop a truely organic system.

COM: Pioneer Electronic Corporation

IND: Audio equipment manufacturer

EST: May, 1947

CAP: ¥5.886 billion

TUR: ¥268 billion

EMP: 7,000

REP: International Department

APP: Data processing

MAC: host IBM 4300
WP WANG 2200 V

PUR: International data processing and word processing

SYS: PIDACS I (Pioneer International Data Communication System) operating from '76

PICOMS (Pioneer International Communication System) from October, 1979, based on the WANG 2200 V.

PIDACS II using the host IBM 4300

COM: Pioneer's export sales are greater than their domestic sales. They also have 5 overseas factories to begin with. It is therefore natural that a fully international system is necessary.

PIDACS I which started operating from 1976 was such a system exclusively developed for data communication internationally. The PICOMS which began in 1979 is being applied for all types of documentation, addressing, electronic mail operations, automatic transmission and reception of telex. and other more advanced operations

such as price and other types of simulation programs, list making, various calculations, SORT, etc are included.

PIDACS II is more reserved for order and purchase, inventory and sales statistic record keeping and processing.

They presently have 49 work stations (keyboard & display terminals), and 30 printer units.

The International Department has 270 employees of which 60% are women. They believe that office automation in their company should be called office "womanization". They feel that OA does not equal to reduction of personnel. They expressed the imporatnce of achieving balance between human ability and machine performance.

FUT: They are presently considering the application of other communication equipment available such as intelligent copiers, fax, and Japanese word processors, along with more sophisticated equipment such as image processing, voice input, micro-picture (as differentiated from film) filing systems, laser disk filing systems, and local network composition.

COST: ¥20 million/month including network.
10% increase if fax and copier use is included.

COM: Misawa Homes, Co., Ltd.

IND: Manufacture & sales of prefabricated homes.

EST: March, 1951

CAP: ¥2.553 billion

TUR: ¥106.3 billion (roughly)

EMP: 912

REP: Shigeru Isobe, Information Administration Sect., President's Room.

APP: Voice response to real estate location.

MAC: Hitachi HITAC M-150H
H-1100(voice response device)
HF-343X

PUR: Promoting of the integration of the real estate industry through voice real estate information

SYS: The company is involved in the manufacture and sales of prefabricated homes. However, there is much demand from former clients asking for help in relocation and/or buying new land for building houses because their family expanded, etc. Since the company is not directly involved with real estate, they have devised a system in which the prospective customers can visit any of the major real estate agencies/dealers that belong to the "Misawa voice response service" group.

Misawa's large scale computer is linked to each of the participating members by public network, and all information on available and/or wanted real estate is transferred. The biggest problem so far has always been the human factor - input. They have therefore adopted a voice response system in which the computer answers in a female voice and gives instructions as how to respond and/or input pertinant data. For incoming requests for possible real estate information, answers are sent back to the

members by fax.

COS: ¥30,000 for use of the computer
¥20,000 for fax rental
No handling charges are asked by Misawa. > per month

RES: There are presently 450 participating members, with roughly 40 new members joining every month. The system itself has now become the largest real estate "agency" in Japan.

COM: The system naturally is very welcomed by participating members. It basically costs nothing except for the cost of the hardware. With the increase in real estate prices, real estate brokers and housing agents (of which more than 90% are 1 to a few people operations) find it difficult to effectively sell their services.

EVA: No formal evaluation process has taken place except in terms of new participants and the number of real estate pieces sold.

FUT: They plan to continue enlarging their list of participating members.

COM: Kirin Lemon Service Ltd.

IND: Manufacture of softdrinks. Part of the Kirin Breweries Group which hold top position (60% market share) for beer sales.

EST:

CAP:

TUR:

EMP:

MAC: Canon HT-3000 (plug compatible with the host EM10 Canon Office Computer

COST: ¥158,000

PUR: Increase clerical/accounting/inventory efficiency.

APP: Outdoor OA.
They have presently about 40 sales office scattered all over Japan. They wanted a system to to rationalize all types of clerical and inventory operations which was being processed by hand before being fed into the host.

SYS: The compact hand-held computer is taken out by the employee who serves as the truck driver, and delivery man together. Instead of writing out inventory lists and delivery bills, receipts, etc., he merely punches it out into his handy computer (which resembles a hand-held programmable computer/calculator). He does not have to do that at the spot. He can punch in at the gas station when he fills up the truck, etc. Since he already has his distribution list for the day in the morning, he doesn't have to report to the office and prepare such bills. He also does not have to punch in the figures after he returns back to the distribution center in the evening. All he has to do is to connect the machine to the host, and the rest is taken care of by the host computer.

RES: Prints out bills on the spot or beforehand and a copy can be kept. No messy hand-written documents.

Light-weight, and very durable.

Inexpensive.

COM: When compared to other means of rationalization, the applications of this company are very inexpensive.

FUT: This system can be said to be a pioneer case for all future rationalization fo the distribution industry.

COM: Sogo Shimpan Co., Ltd. (General Credit)

IND: Credit company

EST: November, 1981

CAP: ¥ 1 billion

EMP: 150

REP: Hiroshi Ochiai, Deputy Manager, Administrative Dept.

APP: "Cashless" On-line computer shopping

MAC: NEC ACOS System 350
Cash dispenser

PUR: To realize a more healthy and rationalized credit service in step towards a totally cashless society.

SYS: A fully automatic credit card system in which a card member need only to insert his card into a "card-phone" and push out his secret identification code number at a participating store.

The card phone somewhat resembles a push-button phone with a card slot. The card phone is connected to the host ACOS 350 by public network with which the card member's credit standing is cleared. Card members have varying credit ceilings ranging from ¥100,000 - ¥ 5 mil. depending on his financial status.

If the card and the id number match, the host ACOS signals an OK, and presents the member with a receipt and a balance record from the card phone.

The participating shops basically need only to furnish the card phone. The troublesome process of invoicing the credit company is eliminated in this system. The rest of the process is the same with conventional plastic money. Payment is withdrawn from the card member's account and deposited to the designated bank account of

the shop.

Another interesting facet of the GC Card is the cashing service that it provides. The card on a separate cashing ceiling provides cash loans to their members of up to ¥100,000 - ¥700,000. Cash dispensers are located at various places such as coffee shops, restaurants, hotels, supermarkets, department stores, etc. Unlike a bank cashing service, the system and service is available to their members 24 hours a day.

Basically everybody over 18 years of age is eligible for application to GC membership. And each member may register up 2 family members under his name.

RES: All major leisure districts of Tokyo have already picked up the system basically centering around restaurants and other speciality stores. About 2000 stores are presently participating in the GC card, and there are already roughly 100,000 card members.

COM: As can be seen from the number of participating stores and card members, the GC card is rapidly becoming popular in Japan. Their TV and other commercial exposure seems to have been a major factor in its rapid success. Their catch-phrase "even a cup of coffee with the GC CARD" or "A shot of wiskey - in allotments", was a highly successful campaign.

COST:

Hardware at center	¥400 million
On-line terminal	¥1,300 million
Software	¥100 million

Planning	1 year
hardware installtion	8 months

QC: None

COM: Mitsui O.S.K. Lines, Ltd.

IND: Cargo

EST: December, 1942

CAP: ¥39.757 billion

TUR: ¥530.0 billion ('83 estimate)

EMP: 3,574

REP: Domestic Telecommunication Div., Information Systems Dept.

MAC: Matsushita Denso UF-215 High Speed Facsimile
(22 units of which 4 are at head office)
U-272 High Speed, 72-channel Automatic Distribution Device (2 units at head office)

PUR: High speed facsimile (15 sec) network introduction.

To replace Japanese character teletype.

Need for graphic transfer.

Conservation of space

APP: The company realized the first real facsimilized network in Japan. The 7 and 8 floors of their head office were formerly the Information Systems Department where the 8 floor was reserved for computer processing and the 7 floor for communication. The (tele-) Communications Division was switched over to a facsimile system from teletype.

The Japanese teletype was replaced for several reasons. First of all, it has recently become more and more difficult to recruit operators. They had 12 teletype operators at the head office, but the workload could not be processed during working hours. over 20% were left to be completed after hours. Business was continuously expanding, and pretty soon they had a big overflow.

There was also the need for transferring graphic information. This was formerly achieved by airmail, but time and cost performance problems existed. Again, a fax system was proposed.

A final factor put into consideration for this fax network introduction was ergonomics and environmental improvements. Conservation of space, energy, and noise was achieved.

SYS: At the headoffice, 2 units of the UF-215 are reserved for receiving, and 2 units for transmission only. The 2 U-272 units allows simultanious distribution of documents to all 144 outlets.

Another interesting feature of the U-272 is the function allowing only specific pages of a specific document to be distributed to a designated destination. Different pages of a text (from one batch) can be sent to different addresses.

Some other features:

- Timer setting allows unmanned night-time transmission.
- A4 size texts can be sent in 15 seconds.
- Automatic Matching/Machine Selection allows safe communication even with receiving sides having different machines.
- Cut-In functions allows distribution of top priority documents while transmission of regular documents on automatic operation is momentarily suspended.

RES: They now send about 3000 A4 pages of documents daily, but the load is easily cleared within normal working hours. They expect even better results in terms of efficiency through use of automatic timer-controlled transmissions in the night. With the facsimile network in operation, they have also changed their filing system. They now have virtually no documentation files.

FUT: They plan to expand this fax network to 250-260 companies.

BUD: Initial investment for harware roughly ¥100 mil.

COM: Nippon Seiko KK.

IND: Manufacture & sales of bearings

EST: November, 1915

CAP: ¥15.4 billion

TUR: ¥182.9 billion

EMP: 7200

RES: Tadao Ogawa, Section manager, EDP Center

APP: The transfer of bearing diagrams directly to branches and outlets quickly and efficiently via fax.

MAC: Matsushita Image Information Distribution System CF-3400

SYS: Image Information Distribution System

Basically a direct access to the host computer for drawings and diagrams out of the roughly 100,000 types they have stored there. Initially, such drawings had to be drawn out on a plotter, then faxed to what ever destination or sent out by mail. Mail required much time and bulk whereas the image quality by fax was not something that could be directly handed out to clients. A new system has been developed allowing vector signals from the computer to be converted to raster signals for fax, and to be dispatched directly to be printed-out on the receiving end fax machine.

PUR: To improve efficiency, reduce time factor.

RES: The system was a trial development jointly undertaken by Nippon Seiko and Matsushita. The machine allows access to the head office's host computer in real time. Operation is basically the same as with ordinary fax. The drawings' specifications are listed up

on a CRT at the branch or at the factories, then searched on-line within the host computer. The need for an X - Y plotter was eliminated. Output is clearer than with such a plotter, and other information directly related with the drawing on the drawings themselves (often in Japanese characters), are printed out very cleanly. Such fax copies can be handed over to clients directly. G III facsimile machines have now been installed at all branches and factories. Naturally, these machines can also be used as ordinary fax.

Efficiency has improved in terms of higher speed and faster response to clients. They mentioned its strategic importance over competitors. No actual figures were ever calculated.

EVA: No formal evaluation seems to have been made.

COM: Operation and handling is very simple, and there have been no problems with personnel using the equipment. The project is a great success.

FUT: Apply the new hardware to an aggressive national sales strategy.

COST: The hardware cost was put at ¥18 million. They once calculated the running cost of the equipment for graphic fax distribution originating in Tokyo only, and it turned out to ¥60,000 (roughly) a month at the time the system began operation.

QC: They have no direct QC activities related to OA, however, they mentioned that they have made minor preparations for the preparation of such a system. They also expressed their opinions that the rationalization process itself was their QC.

:OMPANY: Nisshin Steel Co., Ltd.

'IELD: Manufacture, processing, and sales of steel

:STABLISHED: April, 1959.

:APITAL: ¥39.1 bil.

ANNUAL SALES:¥349.5 bil

:MPLOYEES: 9,184

ÈSPONSIBILITY: General Affairs Dept.

APPLICATION: Facsimile network

HINE: National, PANAFAX UF-520 III

'URPOSE: Comprehensive communication rationalization of telephone, facsimile, and other data.

Drastically reduce cost by renovating conventional telephone based intra-company communication methods.

;YSTEM: NAIS-1 (Nisshin All Information System - Phase I)

Established a network installing units at the head office in Tokyo, at the Hanshin Plant, and at the Kure Steel Works using the NTT's exclusive large scale circuits for fax. Each of the 3 electronic circuit switchboards are also connected to a number of their branch offices and related/subsidiary offices and companies. Since the unit is multimode, it can be also directly be connected to various types found overseas.

Information can also be dispatched to various destinations simultaneously rather than one destination at a time.

ESULTS: A drastic reduction of telephone and mail costs. Information that can be delivered at one time drastically increased.

Internationally, telex was almost replaced, and it allowed the dispatch of information in handwritten Japanese rather than in typed Romanized characters, saving very much time and precision of information

:UTURE: They plan to enlarge this network to the branches and offices where it has not yet been applied to. They also plan on establishing a company mail system (extending this system) and even television conference system.

BUDGET: Refused to disclose.

QUALITY CONTROL: Before they began on their fax network endeavor they calculated their basic communication expenditure and came to the realization that 68% amounted to intra-company communication. They therefore became serious about rationalization. This they expressed as an QC effort extension.

COM: Kawasaki Heavy Industries

IND: Integrated heavy machinery mfg.

EST: October, 1896

CAP: ¥125.586 billion

TUR: ¥740 billion ('83 estimate)

EMP: 25,597 ('82)

REP: Kobe Works Word Processing Center

APP: Word processing
Facsimile

MAC: WANG word processors
IBM 3033

PUR: Integrated word processing

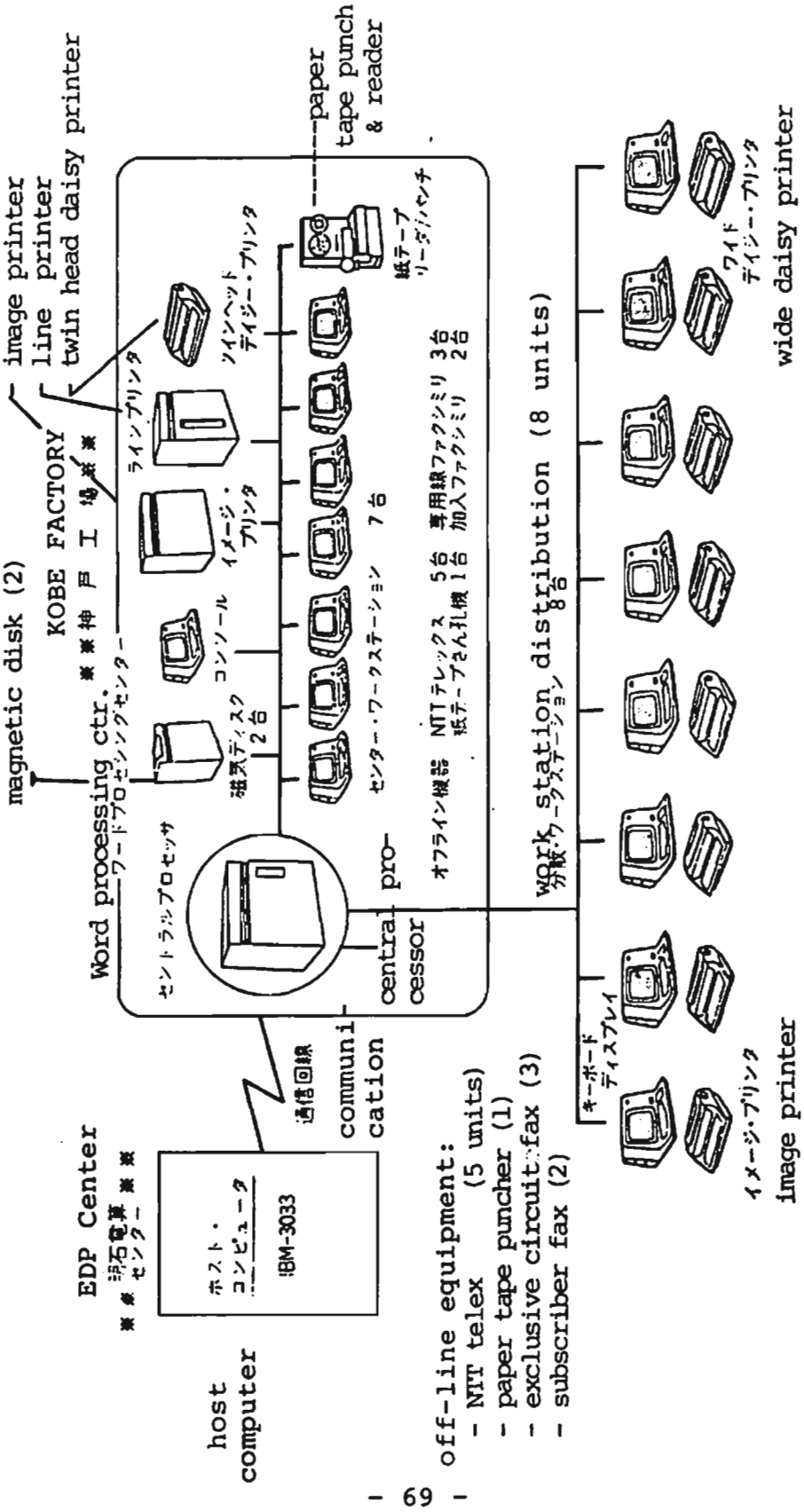
SYS: This was the first systemized word processor application in Japan.

Kawasaki developed their original software based on the WANG VS Combined System. The system can process English, German, French, and Spanish. It can search terms in all of the above languages, and process extremely large volumes of documentation.

File transfer is made possible linked to the host computer via communication lines.

RES: The company handles large plant construction and transfer business internationally, and therefore sometimes a single document may consist of over 500 pages. The cost for subcontracting typing and composition at one time was over ¥140/yr. Of the total volume, the Kobe Works was the biggest spender, meaning they had the largest volume of documentation

With the introduction of the system, they brought the cost down by 42% saving ¥60 million/year. Needless to say, not only was the cost reduced, but security aspects were further enhanced, time decreased, and paper documentation drastically decreased.



COM: Kyoiku Co., Ltd.

IND: Publishing

EST: December, 1968

EMP: 167

REP: Masaharu Fukui, Chief, Management Survey Room

APP: Composition of a variety of documents to be circulated and used within the company, and documents, letters, etc., to be sent out of the company. Not presently used yet for actual editing (typesetting)

Creation of a "Paper-less Office".

MAC: Fujitsu OASYS 100 (Japanese word processor)

PUR: Faster preparation of documents.

Easier management of documents and standardization.

RES: Both objectives listed above have been achieved. Furthermore, the "one page screen" of the OASYS allows easier editing and composition of text. Due to company policy, all internal memos, reports, etc. to be filed and passed on are to be standardized in B4 size. This has been achieved. Texts requiring more space are composed on A3 first, then miniaturized into B4 by copy machine.

COM: "We have aggressively tried to motivate employees to get to know how to handle the machine. This target has been achieved."

FUT: To establish communication (link) between word-processors. Link to the computer (which already has been in operation for other data) and facilitate input of data from floppy disks (wordprocessor). Editing of texts to be published are also now being considered.

COM: Keisen Joshi Gakuen (Keisen Women's College)

IND: Education (women's junior high school, senior high school, and 2-year college)

EST: March, 1929

STUDENTS: 1670

TEACHERS: 240

RES: Masahide Shimana, Section manager, Administrative Dept.

APP: Composition of documents, formal and informal.

MAC: Matsushita PANAWORD 1000 (Japanese)

PUR: Increase efficiency

RES: The composition of formal documents, mostly school regulations and policies which frequently are revised has become a less complicated matter. Formerly, such documents had to be typed (Japanese typewritter). With frequent revisions and alterations at the last moment, the operation was far from efficient. Also, it was stated that although work became a little easier with the installation of an electric Japanese typewriter, it still did not have any editing functions. Now they are extending the use of the word processor to composition of tests and other class materials.

COM: They have mentioned the merrits of standardization of much of their texts. The word processor allowed them to standardize most of their major documents into B4 size, and at the same time document formats have also now been standardized.

FUT: They plan to install several more such units in the near future.

EVA: No formal evaluation processes seem to have been made.

COMPANY:	Meidensha Electric Manufacturing Co., Ltd.
INDUSTRY:	Electric machinery manufacturer
ESTABLISHMENT:	June, 1916
CAPITAL:	¥7.93 billion
ANNUAL SALES:	¥107 billion
EMPLOYEES:	5,500
RESPONSIBILITY:	Shogo Matsumoto, Manager, Planning Administration, SE Headquarters
APPLICATION:	Composition of specifications and estimates.
MACHINES:	3 Japanese Word Processors 2 English Word Processors 1 High Speed Copier (AP7000 Ricoh)
PURPOSE:	Reduce cost Increase efficiency
RESULTS:	Former annual printing cost of about ¥80 million reduced by 50%. Increased efficiency.

COMMENTS/RESULTS:

Estimates and specifications formerly had to be custom prepared for each company even when much of the contents were the same. With the introduction of word processors, not only was time saved in the preparation of such texts, but it also served in the standardization of such texts. Another important factor is the security factor. They formerly had to subcontract much of the typing work, facing great security risks and the fear of competitors becoming aware of their prices. Now even clerical female staff can create such texts if the specifications are given to them. Another spin-off effect was the skill advancement of the female staff.

FUTURE:	Develop a fax network, and create a central "printing center".

COM: Marubeni Corporation

IND: Trading company

EST: December, 1949

CAP: ¥43.149 billion

TUR: ¥10.1846 trillion

EMP: 8.045

REP: Yoichi Ohmori, Section Manager, Administrative Planning Sect., Office Administration Dept.

APP: Education of personnel on computers and operation of word processors. As stock (practical) learning (teaching) aids.

MAC: Toshiba WORDPAL 20 (Japanese word processor)
BASIC Master Level III

PUR: To advance the use of computers throughout the company to increase efficiency and quality of work. A step in the final target to level up the use of large scale computers.

SYS: An OA Corner was established within the floor space of the Office Administration Dept. and the above machines were employed to educate personnel in their use. The corner is open to everybody. Classes for the computer are standardized into a daily 3 hour class lasting 5-6 days. For the operation of the word processor, a one-time class of 2-3 hours is given. The rest is left to individual use/practise.

RES: The personal computer course has already graduated 200 persons, and the word processor course 100. The company is presently at the midpoint of a 6-year plan/project to increase and level-up the use of large scale computers. They plan to achieve this first by enlarging the number of personnel who are already

familiar with computers. Another important factor in this project is the target to accumulate original software programs, to file it, and to have personnel from each of the various departments have access to them instead of merely keeping them in the dept.

COM: They are presently working very hard to realize this 6 year plan in which time they plan to have clerical and office efficiency upped. They mentioned the importance in such projects to work very closely with makers/vendors, The Office Administration dept. therefore holds monthly meetings with Hitachi to discuss the various needs of the company.

EVA: No formal evaluation has taken place yet except a head count of the number of persons who have completed the courses.

FUT: The project "M" is expected to be completed by December 1984.

BUD: ¥10 million/year

QC: They have QC efforts ongoing in the company. Relations to OA were not mentioned.

TELDOK

Initiated by the Board of the Swedish Telecommunications Administration, the aims of TELDOK include:

- documenting, as early as possible, working applications of telecommunications systems, particularly for office use;
- publishing and distributing – when needed, also translating to Swedish – information on the use of telecommunications systems (particularly for office use), which might otherwise be difficult to obtain; and complete the information so as to increase its value to a Swedish audience and in a Swedish environment;
- study travel and conferences related to the documenting and distributing of information on working applications of telecommunicatons systems, particularly for office use.

On request, more information on TELDOK activities will happily be supplied by members of the TELDOK Editorial Board:

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