INDUSTRIAL DATA PROCESSING APPLICATIONS REPORT

Applications	Management Information System
Type of Industry	Wholesale Cooperative
Name of User	Kesko Oy Helsinki, Finland
Equipment Used	I.C.T. 1500 Computer Systems (four)

Synopsis

Kesko Oy, a retailer-owned wholesale company in Finland, is using four I.C.T. 1500 computers to handle a variety of company operations.

The system processes orders which are received from the branch offices via telephone transmission, updates stock ledgers and prepares invoices, processes returns, produces orderbooks and prints a number of reports involving inventory, customer accounts and other various statistics.

The system uses two I.C.T. 1500 computers with 40K of memory and two I.C.T. 1500 computers with 20K of memory.

Kesko Oy, a retailer-owned wholesale company serving more than 11,000 Finnish retailers, is presently implementing a management information system utilizing four International Computers and Tabulators 1500 computers. There are two computer installations at Kesko. The main one, at the head office in Helsinki has three I.C.T. 1500 computers; the other installation at the central warehouse in Hakkila uses another I.C.T. 1500 computer.

Kesko is the largest business enterprise in Finland, as far as annual turnover is concerned, and is the second largest in Scandinavia. In 1965 its sales amounted to 1.393 million Finnish markkas or 155 million pounds or $435 million.

These sales are spread over the four commercial divisions as follows: foodstuffs division, 50.42 percent; hardware division, 23.28 percent; agricultural supplies and machinery, 19.04 percent and textiles, 7.26 percent. The divisions are represented in each of Kesko's 22 branch offices throughout Finland.

Kesko serves retailers and other customers throughout Finland.

The foodstuffs division covers the complete range of foods, both perishable and processed. The hardware division includes wide ranges of iron goods, building and industrial materials and household appliances. It also deals in domestic gas, oil and coal. The agricultural and machinery division also includes such non-agricultural items as televisions, radios and other electrical goods. The textile division includes a showroom in Helsinki and a clothing factory.

The introduction of electronic data processing at Kesko has been divided into three main phases:

1. The computerization of existing manual routines.
2. A further automation of routines put on the computer.
3. Introduction of a total management information system.

The computerization of existing routines started in late 1962 and was virtually completed by 1965. This phase covered placing on the computer most of the daily routines, the most important application being the pre-invoicing system utilizing data transmission. This phase -- as well as achieving the main objective of transferring these routines onto the computer -- is also useful for the gathering of data for future uses in more sophisticated systems.

Plans for the automation phase include the introduction of scientific methods in stock control, purchasing, transportation scheduling and a further automation of the ordering routine, warehousing, etc. This phase was started early in 1966 with the production of picking lists for the new central warehouse, more sophisticated purchase proposals and automated customer accounts.

The ultimate objective of automatic data processing at Kesko is the introduction of a total management information system. This will be a main top-management information system that will control the various sub-systems for stock control, warehousing, transportation, and market analysis. The basic applications will be based on real-time data processing and will use the advanced techniques and equipment.

Organization of EDP in Kesko

The organization of electronic data processing in Kesko can be divided into two parts, the organization of the EDP department itself and the EDP field organization.

Organization of the EDP Department

The main duty of the EDP Department is comprised of the planning and operation of Kesko's own routines put on the computers. In addition the EDP Department participates in the company's long term planning for information processing, undertakes some service work and acts as an agent for RCA 301 computers.

The organization of the department is as follows: at its head is the department manager, responsible to the administrative director. Immediately below him come the heads of the three sections into which the department is divided. The three sections are those responsible for:

1. Systems analysis and programing
2. Computer operations
3. Punching, typing and the offset litho works

EDP Field Organization

The field organization can also in a way be split into two, that of the head office and that of the branches. First let us deal with the head office; each of the commercial divisions here has an EDP supervisor who, with the help of a small staff, is responsible for all the data processing activities concerned with his division. He is also responsible for forwarding all the suggestions and inquiries of the EDP department to the people concerned in his division, and for the relaying back of the decisions made by them. Another responsibility of his is that of taking care of the interests of his division in the EDP department's plans.

Next we come to the field organization in the branches. The punching of all data in Kesko is completely decentralized, each branch having its own punching department which punches the data and sends them via telephone transmission to the computer center in Helsinki. Each branch also has an EDP liaison officer to deal with all EDP matters between the branch and the head office.

COMPUTER ROOM AT KESKO OY.

Equipment

There are two computer installations at Kesko, the main one, consisting of three I.C.T. 1500 computers (RCA 301) at the head office in Helsinki, and one installation of one I.C.T. 1500 at the central warehouse at Hakkila. They are comprised of the following equipment:

Machine 1 at Helsinki head office:

- 40K central processor
- Simultaneous mode control
- Paper tape reader
- Line printer
- Interrogating typewriter
- 2 x 6 clusters 30 KC/S magnetic tape decks
- Data disc file (44 million characters)

Machine 2 at Helsinki head office:

- 20K central processor
- Paper tape reader
- Paper tape punch
- Card reader
- Line printer
- 1 x 4 cluster 30 KC/S magnetic tape decks

Machine 3 at Helsinki head office:

- 20K central processor
- Paper tape reader
- Line printer
- 1 x 4 cluster 30 KC/S magnetic tape decks

Machine at Hakkila warehouse:

One machine with the same configuration as Machine 1 at Helsinki head office.

Data Transmission

Data is transmitted at a speed of 62.5 characters per second. There is automatic error detection on single-bit errors; more complex errors are detected and the machine stops and an alarm is initiated. The data are punched in T.T.S. code on five-channel paper tape; the machines used are Addo punches and the data is then transmitted over the public telephone networks.

Standardization and Documentation

Great emphasis is placed on the standardization of procedures in both systems planning, including programing, and operation. So far, standard procedures have been established for:

- the definition of terms,
- problem definition,
- control coding,
- method of layout,
- procedure and document analysis,
- flowcharting,
- coding,
- machine time logging,
- control functions,
- general machine operations,
- tape library operation.

THE SYSTEM

Daily Routines on the Computer

The daily usage of the computer is mainly concerned with covering the daily activities of the branches; such as recording changes in stock, and printing dispatch notes and invoices. There are also runs such as the printing of purchase proposals, which are designed to help the buyers, and inventory lists, which help them control stock and take care of possible discrepancies between the physical stock and the stock on the disc file. In connection with the various routines a comprehensive report is produced giving all errors, block and record counts, etc.

Order Processing

Kesko has a general policy of delivering goods ordered two days after the order has been placed. This is achieved in the following way: the salesman at the branch usually has an agreement with the customer to make contact on a certain day or days of the week. Contact is made, either by the salesman or the customer, usually by phone, when the customer, using his customer number and article numbers, gives his order to be delivered on the next delivery day. (As mentioned above, this is usually two days after the placing of the order though in cities where there is a branch office it is sometimes only one day.) The customer may also fill in the required items in the orderbook which he receives every week and either sends this to the branch office using the normal postal service, or he may have an agreement with the branch for it to be collected.

The order is now in the hands of the branch office. It is then punched and sent via telephone transmission to the head office. There is continual punching through the day so that the computer center is able to have three stockledger updating runs which are described in more detail later during the day. The first run starts at about 11 a.m. and the last at about 6 p.m. Ready printed dispatch notes and reports are delivered during the night to the branches in order for the collection of goods in the warehouses to start first thing in the morning. The goods are picked during the day and are ready to be loaded onto the delivery vans the following morning. Or perhaps, in the cases mentioned earlier, loaded and delivered the same day as they are picked.

Stock Ledger Updating and Invoicing

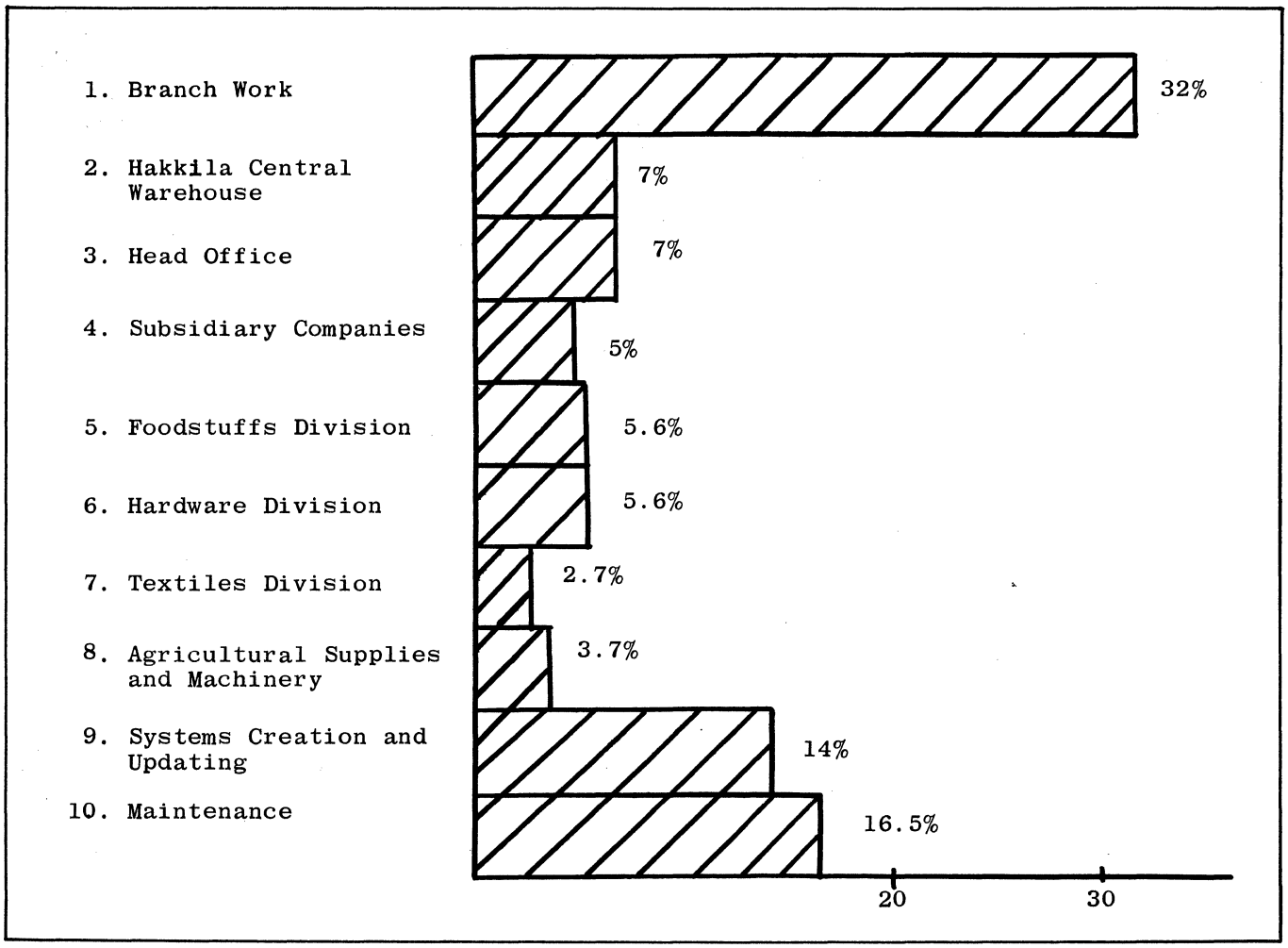
Input to the invoicing routine consists of numerically coded transactions punched on Addo machines in teletype code and sent via telephone transmission from the branches to the computer center. (Because of the code used it is possible in an emergency for the information to be sent by telex.) The transactions are mainly sales, purchases and returns, although it is possible to include exceptions to this rule if necessary. These transactions first go through a comprehensive validation procedure before being written onto magnetic tape.

At the same time the transport route number referring to each transaction is obtained by accessing the customer record on the disc file. The validated transactions are then sorted by priority number, transport route number and transaction type.

The priority number indicates the urgency with which the invoices relating to the transactions with any given number must be produced. A priority number is assigned to each branch. As this priority will, of course, be dependent upon transport facilities not under the company's control (e.g., flight times), it is necessary for the priority number for a given branch to be changed as circumstances alter. It is not practicable to change the branch number itself since this affects almost every other part of the system.

The sorting of the transactions by route number means that the invoices are printed in that order. This, in turn, facilitates the work of the branches in calculating total shipments along given transport routes and in scheduling delivery vehicles. The sorting by transaction code ensures that purchases and returns are processed before sales during the updating run, and also so that any exceptional information, such as a price change, is processed before all other types of transactions.

The stockledger is updated directly onto the disc file; all calculations involving special prices, discounts, etc., are made and an invoice tape prepared for later printing. A further magnetic tape is prepared containing alarm records for articles out of stock or below the re-order level, articles missing from the file, etc. The printing of the invoices is done in two stages, according to the priority numbers, and the limiting value between stages can be adjusted at running time. In this way, invoices destined for the most distant branches, which normally have the highest priority, can be printed separately first so as to catch the last plane out in the evening.



DISTRIBUTION OF COMPUTER TIME.

The tape containing the alarm records is sorted by branch and type of alarm, and then printed with explanations of the type of alarm or error. The information is sent to the branches with the invoice.

Processing of Returns

When goods are returned a credit note must be raised. This is normally done two or three times a week but could be done daily if it did not take so much machine time. The amount of machine time is attributed to the fact that the information relating to the article returned must be retrieved from its original invoice and this information is held on the invoice summary file. These files are kept for one month and any goods returned within this period are liable for crediting.

Once the necessary information has been obtained from the summary file and the disc file updated, the credit note can be printed with the same program as the invoices. In this case red-lined forms with a different heading are used.

Orderbooks

Each week an orderbook is sent to every customer for him to fill in his requirements. These orderbooks contain individually selected lists of articles offered by each department within each branch and the article numbers and prices are all kept up-to-date.

The information found in the orderbook is taken from the data disc file and from a special tape file which, per branch, sales group and article number contains a statistical code, number of weeks between appearances in the orderbook, sales figures from the previous month plus some additional information. Amendments to this tape file are validated in the general adjustment run and run against the file daily.

To ease the workload, all orderbooks are not produced on the same day but rather each day of the week is allocated to certain branches. The pages of the orderbooks are printed on paper suitable for photolithography and are produced in the computer department's litho works.

Purchase Proposals

The purchase proposal is intended to help the branches in their purchase activity. A record is held on magnetic tape giving the period between reviews of each article. If the stock balance -- when taking into consideration the average daily sales -- falls below the reorder limit during the following review period the day of the week on which this article will be included in the proposal is also recorded.

The purchase proposal includes the following information per article:

- suggested order quantity
- number of times purchased during this month
- quantity purchased this month
- week of latest delivery to branch
- number of times sold out this month
- cost price
- average daily sales
- quantity sold this month
- reorder limit
- alarm limit
- stock balance
- identification number of the supplier

Inventory Lists

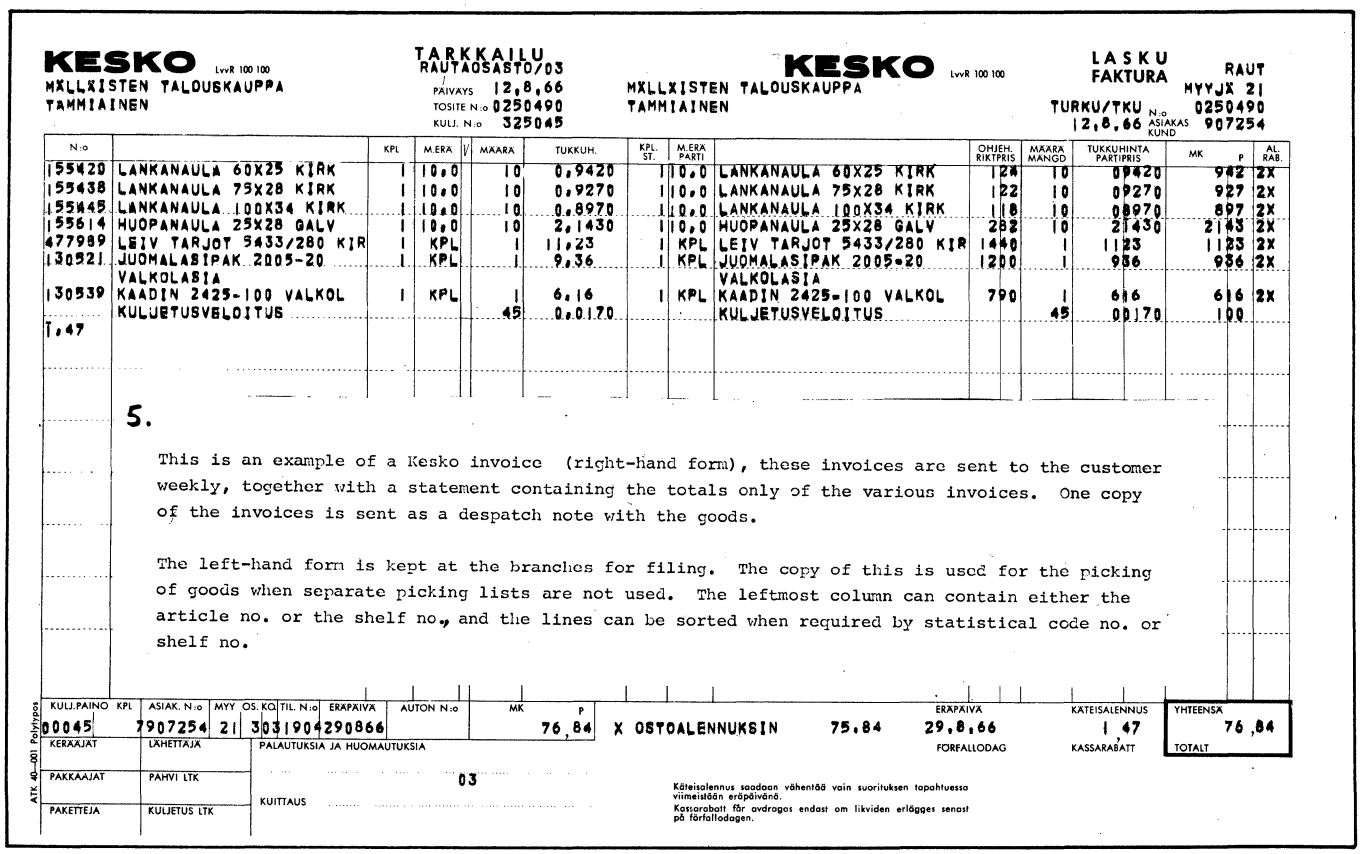
The inventory list is another regular run which is intended to help the branches solve the possible discrepancies between the stock balance shown on the disc file and the actual stock. The frequency of inventory is decided for each article and recorded.

The printed list can be divided into two parts; both parts contain the article number and name and the sales item. On the first part there is also the stock balance; on the second part this is left open to be filled in when the physical inventory is taken and then checked with the first part.

Customer Accounts

An invoice, as previously referred to, does not represent a demand for payment. This is demanded in a weekly statement containing the totals only of deliveries to the customer during the previous week and sent with the invoices to simplify accounting procedure. This statement also shows a cash discount which will be given if the customer meets the statement on or before the date due. If within two weeks after this date, the customer loses the discount. If after this period, however, he is charged interest.

The inputs to this system are condensed invoices, which are an output from the invoice printing run, and so-called "factory" invoices. The latter are for drop shipments, i.e., for goods which have been shipped directly to the customer from the factory. As there is no record of these transactions in the branches' stock ledger, they cannot be prepared by the data processing system, until Kesko receives invoices from the suppliers.



KESKO LvvR 100 100
MÄLLÄISTEN TALOUSKAUPPA
TAMMIAINEN

TARKKAILU
RAUTAOSASTO/03
PÄIVÄYS 12,8,66
TOSITE N:o 0250490
KULJ. N:o 325045

KESKO LvvR 100 100
MÄLLÄISTEN TALOUSKAUPPA
TAMMIAINEN

LASKU
FAKTURA
RAUT
MYYJÄ 21
TURKU/TKU N:o 0250490
12,8,66 ASIAKAS 907254
KUND

N:o		KPL	M.ERÄ	V	MÄÄRÄ	TUKKUH.	KPL. ST.	M.ERÄ PARTI		OHJEH. RIKTPRIS	MÄÄRÄ MÄNGD	TUKKUHINTA PARTIPRIS	MK	P	AL. RAB.
155420	LANKANAULA 60X25 KIRK	1	10,0		10	0,9420	1	10,0	LANKANAULA 60X25 KIRK	124	10	09420	942		2X
155438	LANKANAULA 75X28 KIRK	1	10,0		10	0,9270	1	10,0	LANKANAULA 75X28 KIRK	122	10	09270	927		2X
155445	LANKANAULA 100X34 KIRK	1	10,0		10	0,8970	1	10,0	LANKANAULA 100X34 KIRK	118	10	08970	897		2X
155614	HUOPANAULA 25X28 GALV	1	10,0		10	2,1430	1	10,0	HUOPANAULA 25X28 GALV	282	10	21430	2143		2X
477989	LEIV TARJOT 5433/280 KIR	1	KPL		1	11,23	1	KPL	LEIV TARJOT 5433/280 KIR	1440	1	1123	1123		2X
130521	JUOMALASIPAK 2005-20 VALKOLASIA	1	KPL		1	9,36	1	KPL	JUOMALASIPAK 2005-20 VALKOLASIA	1200	1	936	936		2X
130539	KAADIN 2425-100 VALKOL	1	KPL		1	6,16	1	KPL	KAADIN 2425-100 VALKOL	790	1	616	616		2X
	KULJETUSVELOITUS				45	0,0170			KULJETUSVELOITUS		45	00170	100		
1,47															

5.

This is an example of a Kesko invoice (right-hand form), these invoices are sent to the customer weekly, together with a statement containing the totals only of the various invoices. One copy of the invoices is sent as a despatch note with the goods.

The left-hand form is kept at the branches for filing. The copy of this is used for the picking of goods when separate picking lists are not used. The leftmost column can contain either the article no. or the shelf no., and the lines can be sorted when required by statistical code no. or shelf no.

KULJ.PAINO	KPL	ASIAK. N:o	MYY	OS. KO	TIL. N:o	ERÄPÄIVÄ	AUTON N:o	MK	P
00045		7907254	21	303	1904290866			76	84

X OSTOALENNUKSIN 75.84 ERÄPÄIVÄ 29,8,66 KÄTEISALENNUS 1 47 YHTEENSÄ 76 84

KERÄÄJÄT | LÄHETTÄJÄ | PALAUTUKSIA JA HUOMAUTUKSIA | FÖRFALLODAG | KASSARABATT | TOTALT

PAKKAAJAT | PÄHVI LTK | 03

PAKETTEJA | KULJETUS LTK | KUITTAUS

Käteisalennus saadaan vähentää vain suorituksen tapahtuessa viimeistään eräpäivänä.
Kassarabatt får avdragas endast om likviden erläggas senast på förfallodagen.

ATK 40-001 Polytypos

SAMPLE OF AN INVOICE USED AT KESKO OY.

There are also those invoices with exceptional due dates. These are not normally included in the statement for the current period. Instead, as it is the branches' responsibility to control their customers' credit, every period they punch the numbers of those invoices not to be charged. As a safeguard, to prevent these invoices from being moved forward an infinite number of times, they are charged, regardless of the branches' instructions, after they have been moved forward four times. These moved invoices are merged with the daily output of invoices and together with the "factory" invoices represent all outstanding invoices not charged.

Statistics

There are many types of statistics produced on the computer at Kesko. These can be roughly divided into two groups: customer statistics and article statistics. The most important of these are described more fully below.

Customer Statistics

There are two types of customer statistics which are made monthly. Type 1 shows the value of each customer's purchases from different departments as well as the monthly totals dating from the beginning of the current year. The percentage increase or decrease on year-ago figures is also shown.

Kesko allows its shareholders certain rebates on their purchases. This purchase rebate varies from 2 to 5 percent. These rebates are shown on the customer statistics as two figures, one

being the rebate on purchases from the textiles division, and the other the rebate on all other purchases.

All these sums include the purchases of a certain customer from any of Kesko's branches. As it is considered necessary to know to what extent purchases are made by a customer from other than his "home" branch, this is also shown in the statistics.

The second type of customer statistics shows the purchases of each customer and the gross profit per article group gained by the company. This is calculated monthly and the cumulative figures from the beginning of the current year are also shown, plus a comparison with year-ago figures.

Article Statistics

To help with the control of stock, statistics per individual article and article group are made monthly.

The article statistics include among other things, the sales of each article, the number of times sold and average amount, quantitative purchases, number of times purchased, stock balance or, if out of stock, date sold out, interest on stock value, sales in Fmks and gross profit.

The article group statistics contain more comparative figures. It includes the value of sales for the present month and also an average from the three previous months; stock value at selling price; interest as a percentage of sales and as compared with the previous month; the number of times sold out; the gross profit for the present month and as a percentage of sales. These last two figures are also shown for each article in the group and as cumulative figures from the beginning of the year. In addition, profit over fixed costs is reported.

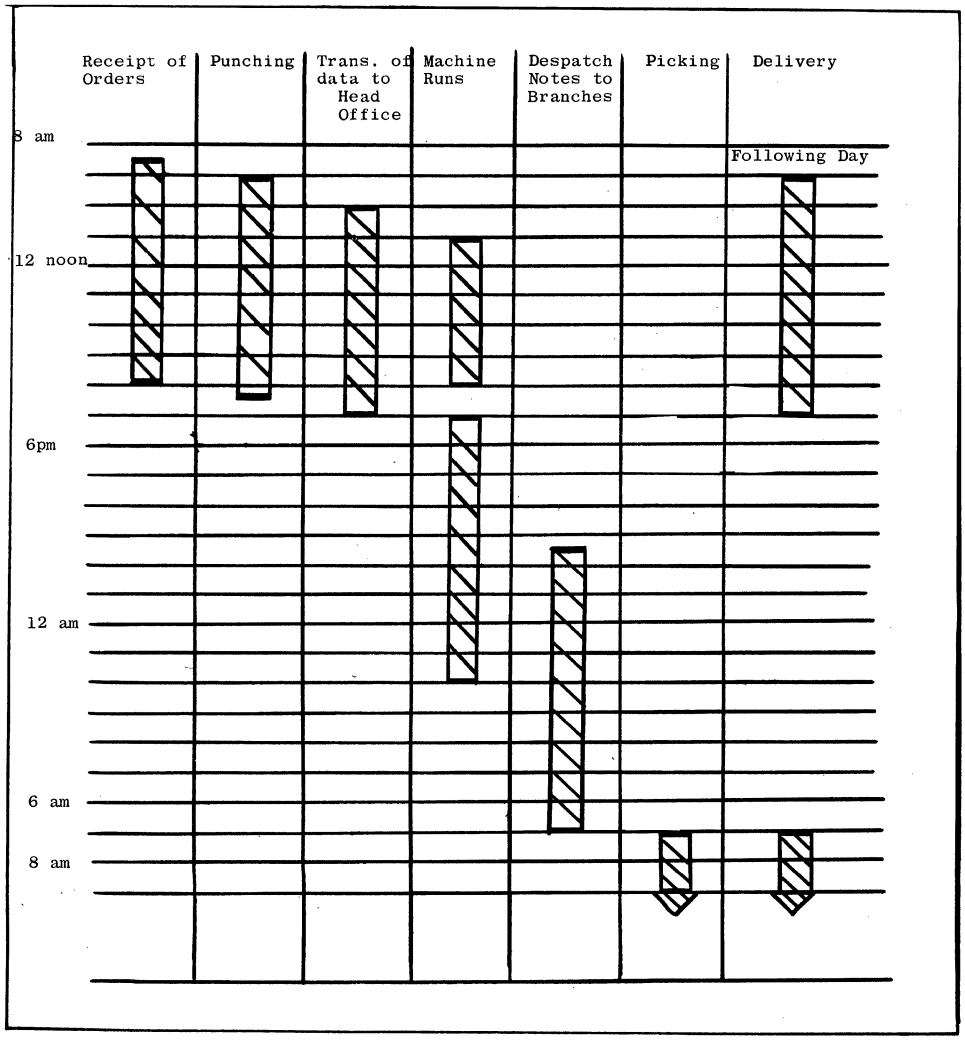
Organization of the Disc File

The disc file is used for the storing of two main files: the customer file and the stock ledger file. As it was possible originally to assign new numbers to both customers and articles it was not necessary to use any random number generating techniques to address either file. The customer file therefore, is accessed by means of a simple self-indexing addressing system. The stock ledger is slightly more complicated because there are two types of records; main article and branch records.

The main article record contains all fixed information relating to each article, such as number, unit of quantity, transport weight, etc. It also contains the addresses of all the associated branch records. There is a separate branch record for each article in every warehouse (a warehouse is usually equal to a branch though there are exceptions, e.g., Hakkila central warehouse serves three branches). This record contains information which varies from branch to branch, such as price, stock level and various items of statistical information which are accumulated during the stock ledger updating run.

The main records are accessed by a system of partial indexing, using a table which is itself stored on the disc file. Branch records are accessed by a chaining technique which involves first reading the main article record. This method was adopted partly because it greatly reduced the amount of storage needed and also because -- although this lengthens the access time for a branch record -- it is seldom necessary to access a branch record without also wanting to access the main record.

For reference and controlling purposes a master card index is kept for all the different types of records. This card file is itself prepared by printing the information held on the disc file. Whenever changes are made to the disc file (excluding changes to stock value and any statistical information), a new card is printed. This is then manually inserted into the file and the old one destroyed, both in the computer center and the branch concerned.



ORDER PROCESSING CYCLE.

Input of Customers

Customer records are punched on seven channel paper tape, which is then validated and written onto magnetic tape, errors being printed out to enable the records to be repunched correctly. The tape is then sorted and the output printed in such a form as to be easily readable and is checked by the branches.

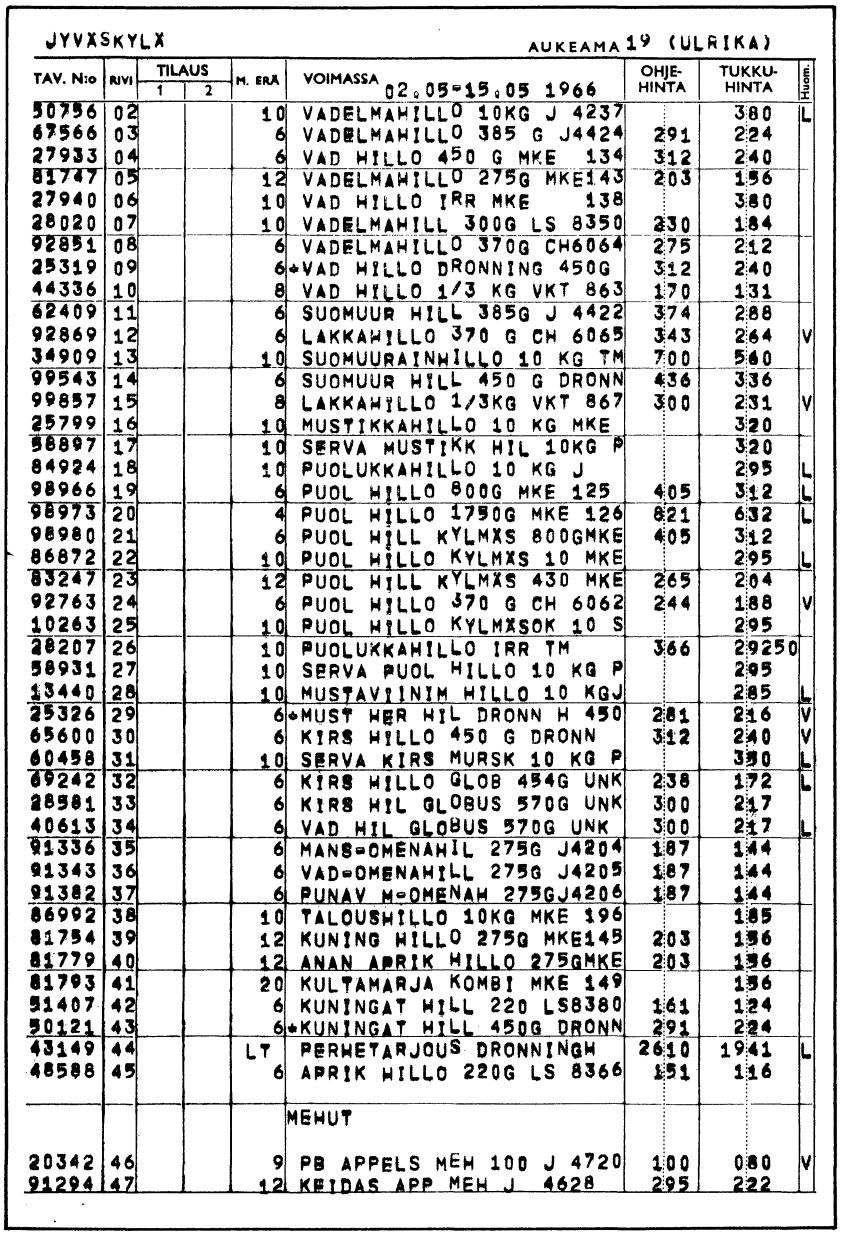
Input of Stock Ledger (Article File)

Before the article file could be put onto the disc, calculations had to be made as to how much storage space would be required. During these calculations allowance also had to be made for the fact that, though an article might only be sold by a quarter of the branches now, in the future it might be sold by more of them. Therefore, for the sake of security more space was reserved on the disc file than was strictly necessary. However, the possibility that records could overflow out of the areas assigned to them still existed and an overflow area was allocated for use in such an emergency and special rules developed for such a time.

The main article records were punched, run through a validating program and put on magnetic tape. The file distribution program then put these onto the disc file, where they were joined after-

wards by the branch records. This was done by means of generalized adjustment programs which made it possible to change any or all fields in any record. The adjustment program writes the new disc records onto magnetic tape which is used to print the cards referred to earlier, so that correct source documents are available at all times.

Because of the flexibility present in the system it is an easy matter to reorganize the disc file. In the normal course of events some articles will cease to be required while others will replace them; also some will increase in demand. All of this causes the storage to be used with decreasing efficiency; therefore, the disc file must be reorganized periodically. This is done by changing various constant parameters in the file distribution program in order to calculate a better distribution for the changed situation. When this has been calculated the latest disc dump (the disc is "dumped" daily onto magnetic tapes) is split into its three constituent parts, namely, main article, branch and customer records, which are then reloaded as in the original loading. This process can usually be done in one night, or over a weekend.



JYVÄSKYLÄ AUKEAMA 19 (ULRIKA)

TAV. N:o	RIVI	TILAUS 1	TILAUS 2	M. ERÄ	VOIMASSA 02.05-15.05 1966	OHJE-HINTA	TUKKU-HINTA	Huom.
50756	02			10	VADELMAHILLO 10KG J 4237		380	L
67566	03			6	VADELMAHILLO 385 G J4424	291	224	
27933	04			6	VAD HILLO 450 G MKE 134	312	240	
81747	05			12	VADELMAHILLO 275G MKE143	203	156	
27940	06			10	VAD HILLO IRR MKE 138		380	
28020	07			10	VADELMAHILL 300G LS 8350	230	184	
92851	08			6	VADELMAHILLO 370G CH6064	275	212	
25319	09			6	*VAD HILLO DRONNING 450G	312	240	
44336	10			8	VAD HILLO 1/3 KG VKT 863	170	131	
62409	11			6	SUOMUUR HILL 385G J 4422	374	288	
92869	12			6	LAKKAHILLO 370 G CH 6065	343	264	V
34909	13			10	SUOMUURAINHILLO 10 KG TM	700	560	
99543	14			6	SUOMUUR HILL 450 G DRONN	436	336	
99857	15			8	LAKKAHILLO 1/3KG VKT 867	300	231	V
25799	16			10	MUSTIKKAHILLO 10 KG MKE		320	
98897	17			10	SERVA MUSTIKK HIL 10KG P		320	
84924	18			10	PUOLUKKAHILLO 10 KG J		295	L
98966	19			6	PUOL HILLO 800G MKE 125	405	312	L
98973	20			4	PUOL HILLO 1750G MKE 126	821	632	L
98980	21			6	PUOL HILL KYLMÄS 800GMKE	405	312	
86872	22			10	PUOL HILLO KYLMÄS 10 MKE		295	L
83247	23			12	PUOL HILL KYLMÄS 430 MKE	265	204	
92763	24			6	PUOL HILLO 370 G CH 6062	244	188	V
10263	25			10	PUOL HILLO KYLMÄSOK 10 S		295	
28207	26			10	PUOLUKKAHILLO IRR TM	366	29250	
58931	27			10	SERVA PUOL HILLO 10 KG P		295	
13440	28			10	MUSTAVIINIM HILLO 10 KGJ		285	L
25326	29			6	*MUST MER HIL DRONN H 450	281	216	V
65600	30			6	KIRS HILLO 450 G DRONN	312	240	V
60458	31			10	SERVA KIRS MURSK 10 KG P		390	L
69242	32			6	KIRS HILLO GLOB 454G UNK	238	172	L
28581	33			6	KIRS HIL GLOBUS 570G UNK	300	217	
40613	34			6	VAD HIL GLOBUS 570G UNK	300	217	L
91336	35			6	MANS-OMENAHIL 275G J4204	187	144	
91343	36			6	VAD-OMENAHILL 275G J4205	187	144	
91382	37			6	PUNAV M-OMENAH 275GJ4206	187	144	
86992	38			10	TALOUSHILLO 10KG MKE 196		185	
81754	39			12	KUNING HILLO 275G MKE145	203	156	
81779	40			12	ANAN APRIK HILLO 275GMKE	203	156	
81793	41			20	KULTAMARJA KOMBI MKE 149		156	
91407	42			6	KUNINGAT HILL 220 LS8380	161	124	
50121	43			6	*KUNINGAT HILL 450G DRONN	291	224	
43149	44			LT	PERHETARJOUS DRONNINGH	2610	1941	L
48588	45			6	APRIK HILLO 220G LS 8366	151	116	
					MEHUT			
20342	46			9	PB APPELS MEH 100 J 4720	100	080	V
91294	47			12	KEIDAS APP MEH J 4628	295	222	

A PAGE OF AN ORDER BOOK. IT IS PRINTED ON PAPER SUITABLE FOR PHOTOLITHOGRAPHY AND THEN PRODUCED IN THE OFFSET-LITHO DEPARTMENT.

It is also possible for a branch to purge a branch record. At the end of a month the statistical data is always initialized and at this time a special code can be inserted to indicate that the record can be taken from the disc during the next reorganization. If a main record has this purge code, it is taken from the disc only if all branch records relating to this article have already been purged. If this is not so, a report is printed and sent to the branches in question. The article record is left on the file until the next monthly reorganization.

Distribution of Computer Time

The computer routines described on the previous pages are only some of the many routines in use at Kesko. The distribution of machine time among the different divisions, the branches and subsidiary companies, and among the different types of work can be seen in the chart.

It can be seen that the work for the branches takes up approximately one-third of the time, while the next highest share is only one-half of this and belongs to maintenance. This, in fact, includes not only the scheduled and unscheduled maintenance but also testing time, assembling, reruns and other miscellaneous items. Close behind this comes systems creation and updating and then there is another drop to Hakkila central warehouse and head office with seven percent each.

Next come three subsidiary companies -- each with approximately five percent of the total -- foodstuffs division and hardware division. Of the other two divisions, agricultural supplies and machinery takes up 3.7 percent of the total while the textiles division has the smallest share, with only 2.7 percent.

The work done for the various divisions, subsidiaries, branches, etc., comprises many applications. These include those previously described such as stock-ledger updating and invoicing, customer and article statistics, and the making of order books, purchase proposals, inventory lists, and picking lists for Hakkila central warehouse. Other applications not mentioned include a credit card invoicing system for one of the subsidiary companies (an oil company) and a system for dealing with magazine subscriptions. This last mentioned is for an agency which handles subscriptions for any magazine or newspaper.

RESULTS AND FUTURE PLANS

The size and complexity of Kesko's business in itself suggested the use of computers. Kesko handles some 9,000 foodstuff items, some 50,000 hardware items, over 35,000 textile articles and 15,000 articles in the agricultural supplies and machinery division. Along with this volume, some five million invoices are issued to customers annually.

The management information system being implemented at Kesko has already computerized the previously existing manual routines and has compiled a significant amount of data and experience toward the implementation of future systems.

The ultimate objective at Kesko is the total system that will allow top management to have information on stock control, warehousing, transportation and market analysis.