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THE SUBCONTRACT EXCHANGE ✓

by

E. Edwards, B.Sc. (Eng.),
Managing Director, Central Production
Information Registers Ltd., England

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INDEX

		Page
1.0	FUNCTION	1
1.1	Extended functions of the Exchange	3
2.0	ESTABLISHMENT	5
2.1	Phase I (Exploratory)	5
2.2	Phase II (Publicity)	7
2.3	Genesis	8
2.4	Cost	8
3.0	ORGANISATION and STRUCTURE	9
3.1	Personnel	9
3.11	Technical Director	9
3.12	Personal Assistant	10
3.2	Accommodation	10
3.3	Finance	10
3.31	Methods of financing	10
3.32	Disadvantages of commission methods	11
3.33	Contract	12
3.4	Control and Structure	12
4.0	DETAILED OPERATION	12
4.1	General	12
4.2	Communication	13
4.3	Information Store	14
4.31	General philosophy	14
4.32	Classification systems	15
4.33	Comparison of systems	16
4.34	Practical system used by CPFB	17
4.35	Security	20
4.4	Procedure	21
4.41	General	21
4.411	Use of Telephone-Answering-Recording Machine	23
4.42	Filing	24
4.5	Surplus Capacity	24
4.6	Visits	24
4.61	Geographical Cards	25
5.0	PROBLEMS	26
5.1	Basic problems	26
5.2	Private and Official Exchanges	26
5.3	Economic Factors	28
5.4	Code of Conduct	29

Index (contd.)

6.0	RECOMMENDATIONS	page 30
6.1	Decision	30
6.2	Establishment	32
6.3	Organisation and Structure	32
6.31	Personnel	32
6.32	Structure	32
3.0	ACKNOWLEDGMENTS	33

APPENDICES

I	Job Specifications (Technical Director; Personal Assistant)	35
II	CPIR Contract	38
III	Enquiry Sheet; Enquiry file-card	41
IV	Enquiry Flow-Chart	43
V	Typical "Machine-File" Edge-punched Card	44
VI	References	45
VII	List of organisations	46
VIII	U.K. and European Exchanges	47

1.0 Function

Basic Idea The Sub-Contract Exchange as an instrument of economic planning is dealt with in accompanying papers. Here, we are considering the Exchange as an 'operator' in a system analysis of sub-contracting. In understanding any new idea, it is helpful to reduce it to its simplest terms, by the introduction of a familiar analogy. To apply this method to the Sub-Contract Exchange, consider the idea of the market-place.

Market-place In the market-place, Sellers offer their varied goods to buyers. There is direct and immediate knowledge of the goods available, in both their quality and diversity. There is competition between Sellers, and also between buyers, because of information and communication. The transactions occur at one place, at one moment in time, both Buyer and Seller speaking the same language and using the same currency. These basic characteristics are the same, whether it is a horse-sale at Newmarket, or the Stock Exchange in the City of London.

Adaptation to industry When applied to sub-contracting, the market-place becomes more complex in operation, and also extended in size. The main contractors ('The Buyers') putting-out work, can be separated by hundreds, or even thousands of miles, from the sub-contractors ('The Sellers'), who have capacity to sell. They are often unaware of each other's existence, and of the capacity ('the goods') demanded and offered. The transaction can span several days or weeks in time, and they do not necessarily speak the same language. The function of the Sub-Contract Exchange is to provide the 'information' and 'communication' present in every market-place,

Present methods Industry attempts to restore these two needs in several ways, and we must remember that this is a two-sided problem. The Buyer, Sub-Contracts Manager (or equivalent person) in a company, will rely on his personal knowledge, built up from experience, on the 'old-boy

- 1 -

1.0 network', on company files, and on the trade press and specialised directories. The sub-contractor will advertise in the local and national press, and in trade journals and directories. He may also employ sales representatives, or manufacturer's agents, to make his company's facilities known to prospective customers, so as to bring work into his factory. These methods, however, rely largely on the chance encounter between the Buyer or Sub-Contracts Manager, and the information available, at the time when he needs it.

The Idea

The idea of the Sub-Contract Exchange can at first be 'sold' only as an engineering super-encyclopaedia. Published information does not meet all the demands of modern industry. It appears weekly, monthly or annually, and is insufficiently detailed because of cost, and can sometimes be inaccurate. The Exchange can save the Buyer time lost in searching, in making fruitless enquiries, and in more competitive prices. The Exchange should be used, not only for the 'difficult' problems, but also for routine enquiries, to keep a check on the prices of one's regular suppliers. The aim of the Exchange should be to achieve the economist's ideal 'free market' conditions, where 'Buyers' and 'Sellers' are immediately aware of each other, and of the goods and prices offered.

S.D.I.

As an information centre, the Sub-Contract Exchange is operating a stage further than the Selective Dissemination of Information (S.D.I.). With SDI, a company receives information in previously specified fields, whether or not this is at the time of immediate interest and use. The Exchange provides positive information when 'commanded' by the company wanting to off-load work. It produces no unwanted information.

Motivation

It must be stressed that it is the Buyer who always initiates the action. The act of putting-out work then satisfies the sub-contractor's need to load his machines. As will be shown later, industry expects

1.0 to start from the other end, and considers that the Sub-Contract Exchange is primarily a 'work-finding' service.

Productivity We shall see, however, that the Sub-Contract Exchange, although simple in operation, can play a real and important part in improving the productivity of its operation region. It can, at small cost, increase the effective capacity of a country, simply by making more use of it. There is always appreciable capacity available, even under 'boom' conditions. To a small company, the supply of adequate capital for growth, is an ever-present problem. This is especially so in under-developed countries, and the Exchange can greatly help the small manufacturer, in achieving his goal of fully-loading his machines.

1.1 Extended functions of the Exchange

In a developing country, there will be few of the services, such as Management Consultancy, Productivity Associations, Industrial Liaison Services, etc., which are normally available in highly-industrialised countries. An Exchange will have to assume some, or all, of these roles, and will be greatly helped in this work, by being already known and trusted by its prospective clients.

'Brain-drain' In any country where there is an excess of 'brain capacity' over manufacturing capacity to make use of it, there will be a 'brain drain': skilled engineers, scientists, doctors, and other professional people, will emigrate to countries who can make better use of their talents and skills. This is true, whether it applies to British and Continental engineers working in the United States, or to Indian doctors practising in British hospitals. The Exchange can help to overcome this problem, by interesting companies abroad, in the idea of using locally available talents and facilities, to carry out **Contract Research**. This type of service already operates in Israel, with great success. As industry develops in a country, the Exchange

1.1 can act as a valuable channel, for companies seeking to license the manufacture of their products.

Licensing

The detailed knowledge and personal contacts possessed by the Exchange, can, by a preliminary survey, save a foreign company a considerable amount of money. An enquiry can be taken to the point where the Exchange's Technical Director will visit with his client, companies who have already considered in detail the proposals. For reasonable fees, the client's task is now reduced from searching for a suitable manufacturer, to deciding which of several to choose from.

Investment
Advice

An Exchange, to operate successfully, must have a local capacity list which is representative of the capacity of the region. From its enquiries, it will know of the degree of loading, and demand for this capacity. This is valuable factual information for any company considering the purchase of a new machine. Too often, this decision is based on intuition due to the lack of specific information. Similarly, companies moving into a 'Development Area', attracted by either Government Grants, or compelled to do so by legislation, often have little local knowledge of the engineering facilities which will be available to them. Before they decide to move, the Exchange can advise them of the actual position: what is already available in the area, and which facilities they themselves will have to provide.

Interpretive
Active Role

Large companies tend to deal directly with Government departments. However, to small and medium companies, the 'Government' is often psychologically as well as physically remote. It is too little realised, that official exhortations, directives, seminars, and brochures, are valueless, in that money is spent to no purpose, if they do not result in action.

The Technical Director of a Sub-Contract Exchange will know personally, the executives of his Member companies. He will have working contacts

1.1 with official bodies, with the Universities and the relevant Ministries. To operate a successful Exchange, he must enjoy the trust and confidence of all these people. He is then in a unique position to act as an interpreter between the Central Government or Administration, and the industry of his Region, especially in relation to the small and medium businesses.

2.0 Establishment

2.1 Phase I (Exploratory)

In setting-up a Sub-Contract Exchange, you are offering a service which does not at the moment exist, and which at the same time, is not only new but novel. Where there are already inter-firm sub-contracting relationships, you are attempting to replace the existing system, with one which is more efficient.

Basic requirements. If an Exchange is to have any chance of succeeding, there are three basic requirements; industrial potential, communication, and support.

Industrial potential

The operating area of the proposed Exchange must be chosen to include a significant industrial potential. This means that there must be a sufficient number of companies, varying in size and diversity of specialisation to make sub-contracting likely, and economically worth-while. Companies in the newer industries, such as electronics, aerospace, plastics, etc., are constantly expanding, and will probably require outside capacity. They are more receptive to new ideas than the older, more conservative, companies in the heavy engineering field. We must not neglect companies in the non-engineering industries, such as brewing, food-manufacture, pharmaceuticals, which will also probably require engineering facilities, and be less likely to know where to find them.

Communication

To operate, an Exchange must be able to communicate with its Member companies, and this presupposes a good postal and telephone service,

2.1 and possibly Telex, as the Exchange expands. Also, in a multi-lingual country, such as India, a common communication language is desirable. Since sub-contracting implies work transfer from one factory to another, it is desirable that the transport system should allow the cheap and easy movement of all items, including heavy castings and fabrications. 'Transport' includes not only road and rail, but also river, canal, and air-freight. The latter can be used with advantage for goods of high intrinsic value, such as jigs and fixtures, and small precision parts.

Support

For its survival, there must be companies prepared to sub-contract work through the Exchange, and to make use of its services. The promoters of an Exchange must, therefore, first approach all companies, persons and organisations, who are likely to give their moral and financial support to this new venture. This is essential for the private venture.

Decision I

An officially-sponsored venture, provided that the 'potential' and 'communication' needs are met, can decide to proceed. The promoters will base their decision on the successful application of the idea in other countries, and on the knowledge of the benefits to be gained from the Exchange's operation. They can refer to published information relating to Exchanges already operating elsewhere. Visits can be made to these organisations, to discuss with their Technical Directors, any similarities or differences between their environmental conditions, and those of the proposed Exchange. Assessing the results of their investigations in terms of 'potential', 'communication' and 'support', the decision is made to pass on to the next phase. At this point, we must also give thought to the composition and structure of the Exchange's controlling body. (See 3.0 'Organisation and Structure')

Phase II (Publicity)

In this phase, the object is to make contact with all companies likely to benefit from the Exchange's services.

Advertising The idea must be given the fullest publicity in the regional and national press, specialised trade journals, the proceedings of the professional institutions, and at stands at trade, State and Provincial Fairs and Expositions. If it is an official undertaking, the promoters can advertise in Post Offices, Government offices, and official publications. The private promoter has little access to official channels of communication. He is also more limited by the cost, but he can often achieve wider publicity, because the Exchange increases 'Productivity', and is in the national interest.

Meeting The publicity campaign is followed by meetings in the principal towns and cities of the proposed operating region. The aim is to attract prominent local industrialists, trade unionists, and public bodies, to attend these meetings, so establishing the importance of the idea.

Invitation An invitation is sent to each company. (Invitation by name produces better results than the impersonal 'Managing Director'.) These names are obtained from a variety of sources: the Register of Companies, the 'old-boy network', Trade Directories, Membership Lists of the Professional Institutions, etc. In large organisations, more than one person can be invited from each Division. We have found that a convenient time to hold meetings is usually in the Autumn, after the Summer Vacation, or alternatively, in the Spring when winter travel is not a problem.

Form of meeting The meeting will take the following form. The Technical Director of the Exchange acts as Chairman. The opening speaker can be an economist, who 'sets the scene', and places the Sub-Contract Exchange

2.2 into the economic framework in which it will operate. The principal speaker will be the Technical Director of a prominent Exchange already operating, who will state what has been achieved by his Exchange. The meeting is then followed by a discussion.

The Technical Director should if possible, persuade a senior executive of a large, well-known local company to open the discussion. If he can then announce his company's intention of joining the Exchange, this will carry great weight, especially if the firm is known to sub-contract a large volume of work. By tape-recording the proceedings, further meetings can be held in the evenings, in the minor towns and centres of the Region.

Follow-up The Director must be a first-class salesman, and he must neglect no opportunity of stating the benefits of the Sub-Contract Exchange. From this series of meetings and the attendant publicity, a nucleus of potential users will result. The Technical Director must visit them, before their interest wanes, to stress the advantages of the service, to assess their potential capacity, and finally, to secure their membership.

2.3 Genesis

The end-product of this activity, which will extend over several months, is a group of user companies, who are Members of the Exchange. This is Genesis. The road from here is long and hard. A Sub-Contract Exchange is a living entity. It is conceived, endures a difficult labour, its childhood is beset with difficulties, and it will never come of age, if not cared for.

2.4 Cost

As a guide, some \$30,000 will be required for the exploratory and publicity phases (I and II) and for the first two years of the Exchange's operation. Initially, there will be little return on

- 2 -

2.4 capital. It is on this basis that the decision is taken on the method of financing the Exchange's operation: a private venture, a Trust or Foundation, subsidised or financed by Trade Association or Government grants, or a fully Government-sponsored undertaking. The relative merits are discussed below under 'Problems' and 'Recommendations'.

3.0 Organisation and Structure

We shall recall here, the basic function of the Sub-Contract Exchange. It is an information store and communication centre, hence its organisation must be directed towards these two ends: the efficient storage and handling of information.

3.1 Personnel

An Exchange handling up to 80 enquiries a week, a quarter of these being 'difficult' and requiring the Technical Director's personal attention, can be run by a Technical Director and a Personal Assistant. The Technical Director is the key to the successful operation of the Exchange. With an indifferent, or incompetent Technical Director, the Exchange will assuredly fail. Worse, the bad example set may hamper any future development of this and other Exchanges, and of similar projects in the country.

3.11 Technical Director

The Job Specification for the Technical Director is set out in detail under Appendix I. Without question, he must be a professional engineer, with wide experience of industry.

3.12 Personal Assistant

The Personal Assistant is required to operate the secretarial function of the Exchange, and, with suitable training, to handle routine enquiries. The detailed specification of this post is also set-out under Appendix I.

3.2 Accommodation

Location The Sub-Contract Exchange should be located at the communication centre of the Region. This will reduce the travelling time of the Technical Director and Members, and also the cost of telephone and Telex calls. This location may not necessarily be the geographical centre, or 'Capital'. However, an official Exchange may have to accept accommodation available in the administrative centre.

Equipment The office equipment should represent the best of modern practice: lateral-filing, photo-copying, micro-filming, Telex, telephone-answering-recording machine, punched cards, etc. "Example is the best teacher". In under-developed countries, where the Exchange has assumed extended responsibilities, the Exchange becomes a focus for new ideas, a place for seminars and exhibitions, and a convenient meeting-place for visiting industrialists. There will be an extensive catalogue library, national and foreign standards, and reference books. There may also be workshops for proving new projects, and for demonstrating 'low-cost automation' methods, etc.

3.3 Finance

3.31 Methods of financing

(1) By payment of a fixed annual subscription based on company size, (number of employees) or on turnover. This method permits an unlimited number of enquiries to be put to the Exchange. No

3.31 (1) contd.

commission is paid on any work received through the Exchange.

(2) Payment of a small registration fee by all users of the Exchange.

The sub-contractors pay, in addition, for any work received through the Exchange, on a fixed or sliding-scale commission basis.

(3) Free use of the Exchange.

(a) This may be a system which allows any company to use the service free-of-charge.

(b) Alternatively, the Sub-Contract Exchange service may be one of the many provided by an organisation, and available to its Members, who pay an annual subscription, to that organisation.

Free advice systems are run by several organisations: Sveriges Mekanförbund, Stockholm, The Ministry of Technology (U.K.) Industrial Liaison Service, the Dutch RijksNijverheidsDienst (R.N.D.). This method of financing is, of course, outside the scope of the privately financed Exchange.

Additional fees

The Exchange must consider also, what fees to charge for consultancy work, and for negotiating licensing agreements. Typical fees might be \$100 per day, and \$10 per hour for consultancy and low-cost automation centres, respectively.

3.32 Commission systems suffer from several disadvantages.

(1) They introduce accounting problems into the Exchange.

(2) It is often difficult to prove the validity of the Exchange's introduction, and hence, to obtain payment due.

(3) An enquiry of small monetary value, can often take up a disproportionate amount of time.

(4) Payment by commission makes the client less likely to use the Exchange a second time for the same type of enquiry. However, he is the one who is penalised, since he may be using for his present enquiry, information obtained earlier, and which may now be out-of-date.

3.32 However, it is true that in payment by commission, a sub-contractor pays only for that work which he receives. We have observed that whilst companies are willing to pay large sums in commission, they will hesitate to enter into a subscription service for \$150 per annum.

3.33
Contract, Agreement Whatever the method of financing, it is essential to have a simple agreement with every user or subscriber. The agreement will set-out in simple every-day language, the services which the Exchange is offering, its hours of work, and any restrictions on the use of the Exchange. The Contract which we have used at CPIR since 1964, is shown under Appendix II.

3.4 Control and Structure (Official venture)

The Board of Directors (or equivalent body) should function in the same way as the Board of Directors of any industrial organisation. They will decide the amount of finance which can be made available, determine the broad objectives of the Exchange's policy, and leave the executives free to carry-out the day-to-day operations, within the limits of the agreed policy. The Board will meet several times a year, to review progress and assess the results.

The Board should comprise six to twelve practical men, representing Member companies, both large and small, the Universities, the Economic Planning, and finance. The Board will engage the Technical Director, and in consultation with him, will also decide on suitable charges for licensing and consultancy work.

4.0 Detailed operation

4.1 General

To understand the detailed operation of the Exchange, we must stress again, the twin ideas of information and communication. Hence you must understand,

- 4.1 (1) how the Exchange communicates with both the main contractor making the enquiry, and also the sub-contractors who will carry out the work, and
- (2) how the information on engineering and allied capacity and facilities is arranged so that it can be easily found.

4.2 Communication

An enquiry is a request from a Buyer for the names of companies who are able and willing to undertake the work he has specified. To illustrate the point, we shall describe the processing of an urgent enquiry.

Urgent enquiry

A telephone or Telex message from the Buyer, specifies work which he wants to off-load. Before proceeding, the Technical Director satisfies himself that the enquiry is fully specified, and if not, questions the Buyer further. He then extracts from the information store, the companies with machines and facilities matching the requirements of the enquiry. A telephone call to these companies, briefly describing the work to be done, establishes the firms willing to undertake this work, within the limitations imposed by the enquirer's specification. A final call to the Buyer relays this information. He can then make direct contact with any of these companies. To provide useful additional information for future similar enquiries, and to guard against later disagreements, this information is always confirmed by letter.

Basic enquiry form

Every enquiry is basically of this form. The initial request, the processing of the stored information to produce the names of suitable manufacturers or suppliers, the confirmation of their willingness to tender, or to undertake the work, the transmission of this information to the Buyer, and finally, the written (or Telex) confirmation of the result to the Buyer.

4.2 The initial request may be amplified by the inclusion of drawings, sketches, material specifications, and samples. In such a case, the enquiry will be received either by post, or by a visit of the Technical Director to the Member company. The enquiry may also demand information not listed at the Exchange, especially in the early days of its operation, and outside sources will have to be contacted. If an enquiry requires the sub-contractors to locate their own suppliers, or sub-sub-contractors, they can, of course, refer back to the Exchange for help. The simple enquiry described earlier, conducted wholly by telephone, may take minutes, or hours. In other cases, several weeks, extending to several months can elapse, especially if the enquiry involves other Exchanges and organisations outside the country.

Extension
Basic
Enquiry

Specification For medium-term enquiries, requiring deliveries of 4 to 6 weeks, the Exchange will usually make a preliminary telephone or Telex check of possible sub-contractors, before issuing the enquiry. Otherwise a week can easily pass, only to receive the answer 'no'. We cannot overstress in all this, the importance of the complete specification of an enquiry by the Buyer. This will include the delivery required (starting date, weekly or monthly volume), whether or not the material is supplied ('free issue'), inspection and test requirements, etc. It is also helpful to the sub-contractors to know if they are tendering for work already on order, or as part of a tender which the originator is submitting.

4.3 Information Store

4.31 General Philosophy

Engineering and allied capacity information is to be stored so that it can easily be found in answer to the demands of an enquiry. The system should be as simple as possible, bearing in mind the requirements of future developments of the Exchange. It is easy to consider only the information processing side of the Exchange, and to forget that

4.31 the Exchange is an organisation operating in the practical everyday world of engineering. It has to produce real answers to real problems, quickly and accurately.

Range,
Method of
classification

Initially, there are two decisions to be made: the range of the information to be stored, and the method of classification. By range we mean, whether or not it will be limited to mechanical engineering, or will cover also electronics, plastics, hydraulics, the supply of materials, and 'bought-out' components, such as motors, pumps, etc. In a developing country, especially, the range can be further extended, so that the Exchange becomes an industrial, rather than a specifically engineering Sub-Contract Exchange. It must be accepted at the very outset, that it will not be possible to catalogue all the capacity of the operating region. However, sufficient information must be recorded, to give accurate and reasonably detailed answers to all enquiries received.

4.32 Classification Systems

There are two main classification systems: hierarchical (analytic) and featured (synthetic).

Hierarchical
1

(1) In the hierarchical system, we choose a few main categories, which are then continuously subdivided, like the trunk and branches of a tree, to define any item we please. A well-known example of this method is the Dewey Decimal Classification used in Libraries.

Featured

(2) In the featured system we have associated fields, each of which can be thought of as a circle representing an 'idea' such as LATHE, AUTOMATIC, etc. To define an item, such as a machine, we 'superimpose' two or more circles, so that AUTOMATIC LATHE is represented by the overlapping area of the two basic circles, LATHE and AUTOMATIC. The system is also referred to as a faceted classification.

4.32 Applying either of the above systems to the operation of the Dictionary Sub-Contract Exchange, in the field of mechanical engineering, we require a 'Dictionary'. In the hierarchical (branching) system this will list the usual mechanical engineering operations and facilities against a code, and vice versa. In the featured system the Dictionary lists the features, which are commonly used ideas and terms in this field, such as LATHE, WELDING, BORING, etc. In either system, the information is recorded on standard file-cards.

Coding system

The purpose of a coding system is to lead from the enquiry specification to the relevant file-cards, listing specific machines or facilities. The user of the hierarchical system consults his Dictionary which for AUTOMATIC LATHE gives the code TA-1. He then has to locate all file-cards bearing the code TA-1.

In the featured system, each item of information is given its own number ('accession number') on entry into the file. The user looking for AUTOMATIC LATHES will select the two feature cards AUTOMATIC and LATHE. Each feature card will bear the numbers of all the file-cards which contain that feature. e.g. All machines and facilities concerned with the idea AUTOMATIC, will have their accession number listed on the AUTOMATIC feature card. Hence, by taking the two cards (above) the user can 'observe' the numbers of all file-cards with the associated idea AUTOMATIC and LATHE, i.e. AUTOMATIC LATHE(S).

4.33 Comparison of the two systems for Exchange use

Cross-linking

The disadvantage of the hierarchical system is that it does not suggest any cross-linking between classifications. For example, (mechanical) metal-polishing might be listed under a different code from (electrolytic) polishing or brightening. In the featured system there are no 'classifications' as such. They are determined by the user at the time of the enquiry, by his choice of feature cards.

4.33 This is not the limitation it at first appears. The operations in mechanical engineering, are not large in number, they are well-defined, and do not change appreciably with time. The cross-linking can be supplied by the engineering experience of the Technical Director, and the Dictionary can also cater for the more obvious ones. The fact that a component can be made by a Power Press, or by Metal Spinning, requires a knowledge of production engineering, and would not be suggested by a featured system. In either system the Dictionary must cater for synonyms. e.g. For THERMAL see HEAT, for PLATING see ELECTRO-DEPOSITION, etc. In the hierarchical system we can also insert 'suggestion cards', as new (or unexpected) cross-links are suggested by experience.

Specific nature of information In operating a Sub-Contract Exchange, we know that there are Horizontal Boring Machines, of a particular size. All we wish to know is where (in which factory) they are to be found. In a Library, the question is more general such as "... (find me) all the articles and books which include information on the grinding of precision instrument gears..." Our question is usually of the type "... who has a machine which cuts 50 off, phenolic material, instrument gears, 120 D.P., 100 teeth, 1/8" face width, 1/8" bore, etc. for delivery in 4 weeks from now..."

Both methods require as many file-cards as there machines to be listed. The featured system needs, additionally, as many feature-cards as there are (basic) engineering terms in the Dictionary. In filing away information, the file-cards themselves are coded, in the hierarchical system, e.g. TA-1 (above). In the featured system the file-cards are numbered, and all the relevant feature-cards have this number 'recorded' on them in some way.

4.34 Practical system in use at CPIR

At CPIR we use a hierarchical system. Our classification has 900

4.34 main operational codes, and 8,000 subdivisions of each of these codes. This gives a total number of 7.2 million unique codes. Over the five years of our operation, we have found this to be adequate, using main codes only. For the first year of our operation, the 18 codes A to R (see Appendix V) were found to be sufficient.

Operational
and
Company
Codes

Each main operation or facility listed in the Dictionary, is known by a simple-to-remember two-letter alphabetic code. Automatic Lathes, or Automatic Turning is TA (Turning Automatic) . Sheet-metal work is Fabrication, Sheet-metal, TSh, etc. We also use group classifications such as EP, EM, EH, designating Precision, Medium and Heavy Engineering, work. Each company is known by its own three-letter code, e.g. British Industrial Engineering is coded as BIE. A list is kept of all these codes, which are used on all the company's file-cards, and in all correspondence with the company.

'ZZZ'
General
Information

We have also found it useful to list under the fictitious company 'ZZZ', general information relating to an item, e.g. CP (operational code) and ZZZ ('company name') might refer to an article on the 'lost-wax' process (Casting Precision) which has appeared in a journal. The file-card would indicate where the article is filed, or would contain a summary of the information contained in the article. Occasionally, the Exchange may find that it has little information, and that a prolonged search has to be made to satisfy the enquiry. A file-card can later be prepared, listing all the companies who were able to provide this service.

'QQQ'
Questions

The 'company code' 'QQQ' has also a special application. Under 'Organisation and Structure', we indicated that the Personal Assistant could, with suitable training, process routine enquiries. Under operational codes we can list the fictitious firm 'QQQ'. Such a card will carry questions to be answered in any enquiry for this particular

4.34 operation.

Economical use of cards For economy, we have found that we can log several machines on the same file-card. These are machines (or facilities) in the same operational group, and located in the same firm: all the surface, cylindrical, centreless, etc. grinding machines. At a later date, if required, more detailed information on each machine can be transcribed onto separate cards. The original cards can still be left in the system.

Edge-punched cards If we use file-cards with the code typed or written on them, we must search visually for the coded cards, as in a Library Card Index. Also, it is clearly very easy to displace a card, which is then 'lost'. At CPR we use edge-punched cards. (see Appendix V) By means of a hand, or keyboard punch, the holes can be cut out to the edge of the card, following pre-arranged rules, so as to give a pattern which will record a unique code. To 'find' a particular card, say TA-1, using a hand-held needle, or (vibratory) sorting frame, all the wanted, TA-1, cards drop off the needle, or fall down in the frame, and can easily be separated from the others in the pack.

Storage To simplify the sorting process, all file-cards are stored in groups, under the first letter of their alphabetic (two-letter) operational code. In each group, they can be stored in any order, e.g. TA, TZ and TU, are all stored under 'T'. As the number of file-cards increases, they can be further stored under sub-classifications, such as TA to TD, TE to TH, etc. In addition to simplifying the finding of any coded card, the system can of course be used to find a 'lost' card. One can also detect misplaced cards (e.g. TA filed under GR) by 'sighting' along the 'grooves' of the assembled cards. A card out-of-order, is easily noted, as there is a break in the groove 'pattern'. If misplaced cards become a serious problem, the solution, apart from being more careful in their use, is to periodically and systematically

4.34 sort the card store, to keep them in order.

Transcription errors

The cards measure 20.3 cms. x 14 cms., and this size enables a detailed specification of a machine to be recorded on the card. Every card also carries the company code, but no other company information. The code leads to a 'Kardex' flip-over desk-file, where company names, addresses, telephone and Telex numbers, and persons to contact, are listed. In this way, only one copy of the information is held, and this reduces the chance of transcription errors. This applies especially to telephone and Telex numbers, whose digits are easily transposed. For companies with whom we deal with only rarely, all the information is recorded on the card, and there is no entry in the 'Kardex' file.

The cards, originally designed in April 1964, have proved very satisfactory under present working conditions. It should be stressed that related codes are all kept along the same edge, as this is of great help in the frame-sorting method. A sort by company name, or by operation, can then be carried out in one operation only.

4.35 Security

Physical

If all file-cards are lost or destroyed, this is a disaster. To safeguard against this, a carbon copy is easily taken of each file-card, as it is typed. Alternatively, the completed file-cards can be micro-filmed at frequent intervals, so that the file can be reconstructed if required. In the last resort, if the original Plant or Capacity Lists are preserved, the file can be rebuilt, but this is a major undertaking. The edge-punched cards are stored in a standard commercial file cabinet. (Choose a file-card size to suit !) The cabinet is lockable.

4.35

Information Our Contract states that we will "...not willingly disclose the contents of the 'Machine File'..to any third person.." Most sub-contractors make their Plant or Capacity Lists freely available, as this is a form of advertisement. Other companies are very reticent about their total capacity, understandably where their competitors are concerned. However, the Exchange never answers a general enquiry as to whether or not a company has a particular machine. During the whole conduct of an enquiry, the identity of the Buyer is never disclosed by the Exchange. All company names and other identifying marks are first removed from drawings.

4.4 Procedure

4.41 General

Enquiry
sheet,
Enquiry
card,
'Flow-Chart'

When an enquiry is received, it is recorded on the standard enquiry sheet (Appendix III). At the same time a carbon copy is taken on an edge-punched card. This 'enquiry card' (Appendix III) can later be used for statistical purposes. The enquiry is checked for sufficient detail. (See 'Q02' above, and 'Flow-Chart' Appendix IV) Across the top of the enquiry sheet and of the card, appear the Buyer's code name, the date of origin, the method of receipt, the main operation(s) involved, and the enquiry number.

Sorting
Processing

The Technical Director establishes the operation(s) and facilities demanded by the enquiry. The Personal Assistant, after consulting the Dictionary of Operational Codes, removes the required block of cards from the card store. The block is sorted to find the sub-contractors whose capacity matches the enquiry, and their names are then recorded on the enquiry sheet. This enables a record to be kept of the sub-contractors involved in the enquiry, the dates of letters sent, details of telephone calls, and the quotations received in response to a written enquiry.

4.41 When writing to sub-contractors a blue and a yellow copy are taken. The blue copy maintains, in each sub-contractor's file, a complete record of all the written enquiries in which he has been involved. The yellow copy is filed in the Buyer's file, thus recording all the sub-contractors to whom the enquiry has been sent. The volume of typing to be carried out can be considerably reduced by the use of pre-printed form letters, which are commonly used in business. All correspondence with the Buyer is recorded on a pink copy. This means that, with the exception of the enquiry sheet, all white sheets in the file are incoming letters. This is a simple system, which enables the Exchange to tell at a glance, how many enquiries any Member has received (number of blue copies) and how many enquiries he has put-out (number of pink copies).

'Progress-chasing' For enquiries conducted wholly by telephone, which tend to be fairly simple to process, we do not keep any record in the sub-contractor's file. However, since we confirm the results of any enquiry, there is always in the Buyer's file a complete record of his enquiries. Written enquiries, which can span several weeks, often require further 'progress-chasing' by the Exchange. A note can be made on the yellow copies (or on the Enquiry Sheet) of details of subsequent telephone conversations and of the quoted prices and deliveries, before the quotations are sent on to the Buyer.

Telephone enquiries When 'wholly-by-telephone' enquiries have to be carried out, at the same time, it is useful to have a 'card-box', similar to that used by Public Libraries for holding their member's tickets. The file-cards for each enquiry are grouped together in the box. If a sub-contractor's telephone is engaged, his card is replaced in the same position. When he is later contacted, his card is put to the back of that group. When all sub-contractors in an enquiry have been approached, the whole block for that enquiry is placed at the back of the box. By operating in this systematic way, nothing is

4.41 overlooked. If the Exchange handles a large number of enquiries, which extend over a period of time, it may be useful to use an 'Enquiry-State Board' 'Enquiry-State, Progress Board', which is like a Train Arrival Board, or Olympic Score Board. This will show at a glance, the state of each current ('live') enquiry.

Telephone Day-Book

For telephoned enquiries, we find it extremely useful to have a 'Telephone Day-Book', which is a ledger-type ruled book, about 2.5 cms. x 20 cms. x 32 cms. This eliminates the frantic search for 'that bit of paper' on which an important message has been written. In this book are recorded brief details of all incoming and outgoing calls. This book, in addition, can be used to keep a check on the Exchange's telephone costs.

4.411 Use of the Telephone-Answering-Recording Machine

Purpose Cost

In a small organisation such as a Sub-Contract Exchange, which may be staffed by only two people, one of whom is frequently out, there are many times when the office may be unattended. A telephone-answering-recording machine (TAM) can be rented (U.K.) on a 7-year contract for an annual charge of about £100 p.a. It is a worthwhile investment. Members have, however, to be educated in its proper use.

Use in the Exchange

For telephoned enquiries which involve such detailed technical information, such as component dimensions, etc. the machine can be used to record the conversation with the buyer, at normal dictation speed. The recording is played back, and at the same time, the enquiry sheet is typed. The enquiry is sent out in the usual way, but a pink copy of the sub-contractors letters is also sent to the buyer, who can telephone the Exchange, if there have been any errors in interpretation or transcription. The machine can, with a typical Director/Secretary extension telephone arrangement, also be used for dictation, by the Technical Director.

4.42 Filing

Description of Filing Cabinet We use a lateral-filing system, which consists of a steel cupboard, with double folding doors (1/4 doors) standing on a base of 46 cms. x 92 cms., 203 cms. high. We can accommodate some 400+ files, which are hooked onto six horizontal rails, extending from left to right in the cupboard. For our correspondence, we use 'foolscap' files (33 cms. x 20 cms.) which will, of course, accommodate the standard A4 size letter-heads. 'Pocket' files are used for storing catalogues, brochures, capacity lists, materials lists, and details of 'bought-out' components. The information can be stored in the pocket files under the company name. Alternatively, it can be filed under the operational code, e.g. if 'StS' is the code for the supply of steel sheet, any such information can be located under 'S' (or 'St').

Coding (colour) of files

There are seven different file-body colours, and eight company name tag colours. This allows a different colour to be used for each rail and different tag colours for the various alphabetical letters on the rail. If a file is out of place, it is easily identified, since either the file-body colour and/or the tag colour, are a mismatch in their surroundings. Files are coded by the Member company's three-letter code. For occasional correspondence, letters are filed under the alphabetical letter in a general file (e.g. 'A-uncoded') but can be later assigned a code, and given their own individual file.

4.5 Surplus Capacity

Our edge-punched cards have the means for listing spare capacity. However, we have found that few companies advise us of their unloaded machines, until it is too late to help them. We do not circularise our Members, but establish the existence of the spare capacity at the time of each enquiry.

4.6 Visits

When a company has decided to join the Exchange, the Technical

4.6 Director must insist on meeting all the people in that organisation who, from experience, he knows will need to use the Exchange. This will include the Buyer, Sub-Contracts Manager, Works or Production Manager, Sales Director, Estimator, etc. Do not assume that because you have spoken to one executive, and have left several copies of your literature explaining the scheme, that your work is done. It may be convenient, especially in dealing with the large organisations, to give a short talk to all the above executives, at a pre-arranged meeting

Reason for

Importance of It is important to visit the Members regularly, particularly in the first year of their Membership. An old English proverb states, "Out of sight, out of mind". Regular visits ensure that the Exchange is not forgotten, and that the Members are kept aware of the services which are always available to them. It takes perhaps two years, before most Members make proper use of the Exchange. Invariably, a visit will produce an enquiry.

4.61 Geographical Cards

Purpose To make the fullest use of the Technical Director's time in visiting an area, we have prepared 'Geographical Cards'. These list under a 'geographical code', all companies with whom we deal. When preparing a visit to an area, these cards will show all the firms which he can visit.

Coding There are different ways of coding these cards. One can use co-ordinate references, the so-called 'grid-reference' system. This is ideal for pin-pointing the exact location of a small company tucked away down a back street, and can be entered on its 'company address, telephone etc. information'. However, a better method is to choose 'centres', usually the principal towns and cities of the Region, which then form convenient bases for visits. Firms can be located by their nearest 'principal town'. This is not a 'perfect system', but it is simple to operate, without being unnecessarily complex.

5.0 Problems

5.1 Basic problems

Marketing Throughout this paper, in explaining the Sub-Contract Exchange, we have stressed the importance of the twin ideas of information and communication. The fundamental problem in any Exchange, is not information processing, but marketing. The Exchange's success depends on securing an adequate number of companies, who will use its services.

'Work-finding' service It has been our continued experience that companies, irrespective of size, see the Sub-Contract Exchange first and foremost, as a 'work-finding' service. They consider it to be additional to their expenditure on sales representation. The means of finding capacity, especially in a highly-developed country, is apparently available. Finding work, however, is a real and ever-present problem for every company, large or small. This action may be disguised under the title of 'marketing', but its meaning is still to bring work into the factory.

Reluctance to use Buyers feel that the use of an Exchange is a reflection on their professional competence. This is, of course, not so, as the Exchange does not set out to compete, but rather to assist, by providing the Buyer with additional information. There is also a general conservatism to use anything 'new', and a lack of enterprise to try and locate alternative and perhaps more competitive suppliers. This use of the Exchange as a means of saving time and money is very little appreciated.

5.2 Private and Official Exchanges

An officially supported Exchange, if part of a Trade Association, often starts with a readymade membership, who are able to use the service free-of-charge, or for a nominal sum. The Association is already known to the potential users, and will also have useful contacts

- 5.2 with the various official bodies. A private Exchange starts with nothing, and has the problem of persuading companies to join a non-existent service, in the hope of obtaining an adequate return for their subscriptions. There then ensues the impossible situation, where a company will join if there are a sufficient number of companies in the scheme, all of whom will join if the 'other company' will first join. This is, of course, dictated by the 'work-finding' conception of the service.
- Initial difficulties of Private Exchange**
- Income/Growth**
- Small membership, of course, brings small income, which constrains the Exchange in its attempts to advertise more widely, by whatever means, the benefits to be gained from the service. For this reason, it may be that it will never attain that size, which will ensure its growth. Then, every company joining the Exchange, is a potential work source, which will induce further companies to join.
- Dealing with non-profit systems**
- A private Exchange will have difficulties in dealing with other non-profit making Exchanges. Who then pays for the service? Often this problem can be resolved, by operating a reciprocal arrangement. However, if the negotiation of a licence agreement requires a week of the Technical Director's time, he can hardly make no charge for this.
- Official Exchange-Plan**
- An official Exchange can be uncompromising in its pursuit of a logical, pre-arranged plan, which has considered the overall growth of the idea. It may, for example, spend its early days in collecting capacity information, so that, when it opens its doors, it is immediately in a position to offer a varied choice of capacity.
- Private Exchange-Work flow**
- The private Exchange, starts with few Members, who can provide little work and capacity, and it will be forced, in answering their enquiries, to put out work to 'non-Members'. These companies, although they will be delighted to receive the work, are less willing to subscribe to the Exchange service, because of the small work flow.

5.2 The private Exchange will also tend to concentrate on satisfying the insatiable demand of its Members for work, so that the Technical Director becomes a low-salaried sales representative for a large number of firms. Only during the quieter periods, will he have the time to consider the overall growth and development of the Exchange. In this attempt to retain the goodwill of the Members, there is the danger of continually extending the service into diverse fields, so that it becomes a cheap 'Enquire Within' system.

5.3 Economic Factors

Exchange not a work source Tax systems An Exchange cannot generate work. It is a link in a communication chain. For it to succeed, there must be a sufficient volume of work being sub-contracted. It is most likely to succeed in a buoyant, competitive economy, where there is a demand for outside capacity, coupled with the pressure to seek-out better prices, quality and delivery. The amount of work sub-contracted is a part of the total industrial work-load, and of this, a further reduced fraction only, will appear as enquiries put through the Exchange. The country's tax system will also have a profound effect on the amount of sub-contracting: for example, whether or not a type of 'Value-added Tax' (V.A.T.) is in force.

Recession It is ironical that the Members' demand for work is greatest, when the Exchange is least able to satisfy it, i.e. during a recession. However, the 'averaging effect' of the Exchange's operation can partially alleviate these conditions, by importing work from neighbouring Regions. Advantage may also be taken of the difference in the time of occurrence of booms and recessions in different countries.

'Speciality' Sub-Contracting Most engineering sub-contracting to-day, is carried out to meet peaks in capacity demand at a factory, irrespective of economic factors. An increase in the use of the Sub-Contract Exchange will only come about as we turn more and more to 'speciality sub-contracting'.

5.3 This means placing work with outside companies, since they possess the specialised machines, specialised skills, stocks of scarce materials, and have a quicker turn-around, all of which make it uneconomic to attempt to do the work in one's own factory.

Existing examples

We see this trend to-day in the automobile industry, and in electronics, where the manufacture of transistors and micro-circuits is now concentrated in a few large specialist companies. Trade is now international, competition fierce, and technology complex. No firm, however large, trading under these conditions can efficiently encompass all the required manufacturing skills and processes, without becoming over-extended. It would be an engineering colossus. Every operation must now be carried out at minimum cost, and the large company will, as deliberate policy, sub-contract that part of its production which it cannot economically undertake itself.

5.4 Code of Conduct

The Sub-Contract Exchange is an interlinked system of companies, where the actions of one firm affect others, in the Exchange, and later react on itself.

of the Exchange

It is unfortunate that companies whose need is often greatest, do not make full use of the Exchange. They use it as a 'last resort', when all else has been tried, and present the Exchange with the problem of finding capacity in a few days, for a demand which has existed for several weeks, or longer. We also meet companies who complain of the scarcity of work, and who either do not reply to enquiries, or do so with great delay, and with non-competitive prices. In such cases the Exchange is always blamed :

Accurate capacity information

The efficient operation of the Exchange is also hindered by companies who are unaware of the need of detailed information of their facilities. "A machine which is not listed, does not exist".

5.4 **Enquiry specification** Similarly, the vague specification of an enquiry, prepares the way for later misunderstanding, e.g. the use of ill-defined and over-used words such as 'urgent', 'good finish', etc. Poor specification is the result of lack of thought and/or technical knowledge on the part of the originator, whether it is the engineer, or the buyer who issues the enquiry.

'Feedback' Frequently, we are not told of the results of an enquiry: whether or not the Buyer placed the work, and if he was satisfied with the quality, delivery of the sub-contractor. It is most important that all enquiries placed should be pursued. Otherwise, this can lead to a loss of trust between the Exchange and its Members, which can affect future enquiries.

Sometimes, with an urgent enquiry (conducted wholly by telephone) it is found that, on further investigation, none of the recommended sub-contractors will undertake the work. Few Buyers then recall the Exchange to ask for further names. The processing of an enquiry is, after all, a compromise between many factors, such as delivery required, the number of sub-contractors that can be approached in the time available, material supply, etc.

Similarly, few companies inform the Exchange, as a matter of course of the names of the firms that they have already approached unsuccessfully. To re-approach the same sub-contractors, especially with an extensive enquiry is a waste of everyone's time. It is discourteous, it suggests incompetence on the part of the Exchange, and it can lead to considerable ill-will.

6.0 Recommendations

6.1 Decision

We strongly recommend that a Sub-Contract Exchange system should be established in all industrialised and developing countries.

6.1 Decision (contd.)

- (1) It will improve the communication channels which already exist in a highly-developed country, and will initiate them in a country in the process of development.

The aim should be to have a network of Exchanges, linked together, so that we attain the ideal of local knowledge, allied to national and international coverage. In a developing country, the Exchange can be started in the most 'industrialised' province or Region, and further Centres started as the idea gains ground. Alternatively, one Exchange can be established, and later split up into further Centres.

- (2) At low cost, the Sub-Contract Exchange produces a more competitive industry, since the Buyer has greater choice at his fingertips, and the sub-contractor a greater possibility of loading his machines. The Sub-Contract Exchange is a simple but powerful instrument in the maximisation of industrial resources. The supply of growth capital is an ever-present problem for the small and medium business, even in the highly industrialised countries. In developing countries, there is a critical shortage of such capital.
- (3) The Exchange can be the initiator and the catalyst in a process of industrial improvement, especially for the small and medium firms. Even in this age of large international corporations, they are still the industrial backbone of a nation.
- (4) The by-product of the Exchange's day-to-day operation is valuable information on the type and quantity of sub-contracting. This is of value not only to the Economic Planning, but also to the industrialist wishing to re-equip or diversify. The Exchange's local knowledge is of value to the company relocating in a new area. As is the Economic Planning to strategy, so is the Sub-Contract Exchange to tactics.

6.2 Establishment

The establishment of an Exchange must not be lightly undertaken, otherwise the failure which will follow bad preparation, will prejudice other and similar ventures.

The essential requirements are,

- (1) Sufficient work sources (usually the larger firms) to provide an adequate demand for capacity.
- (2) Sufficient sub-contractors to ensure satisfactory solutions to these diverse and fluctuating capacity demands.
- (3) A good communication and transport system.
- (4) Adequate finance. An appreciation that, at a conservative estimate, an initial outlay over the first two years, will be some £30,000.
- (5) A decision on the range of services to be offered: engineering capacity, materials, 'bought-out' components, consultancy, licensing, contract research, etc.

6.3 Organisation and Structure

6.31 Personnel

Their qualifications are specified in Appendix I. We will only re-emphasise the critical role of the Technical Director.

As an Exchange system grows more complex, we must consider the appointment of experts in separate fields, such as machining, castings, etc., probably located at the Central Exchange, where they can advise the satellite Exchanges on difficult problems.

6.32 Structure

A Sub-Contract Exchange operates to the economic benefit of a country. Hence, we recommend that the Exchanges should be administered by a Trust or Foundation, with adequate financial support from the Central Government. Its terms of reference must be drawn with imagination and understanding, and although it is an 'official' body, it must be flexible

6.32 and sympathetic in its attitude to the task. The Exchange service will be free to all who wish to use it. However, there will be operating rules to which Members will be required to adhere. These rules will be incorporated in a simple agreement which all users will be required to sign. (See Appendix II) The Exchange will have the right to refuse to accept or renew an agreement. As it takes time to learn to use the services of a Sub-Contract Exchange, we do not wish to encourage companies who enter or leave the service, to suit their own convenience.

We do not consider that a Trade Association or a professional body, with specific interests, to be suited to operate an Exchange, since its views are confined to those of its own field, whilst an Exchange will operate over the whole range of industry. Indeed, although most Sub-Contract Exchanges operate mainly in the field of mechanical engineering, there is no reason why their techniques should not be applied to other industries, such as textiles, printing, wood-working, etc.

7.0 Acknowledgments

We thank the Directors of the organisations listed under Appendix VII, for making available to us, information on the operation of their Exchanges.

The writer wishes to thank Mr. R. Barratt, Department Head (Mining), Northern College of Further Education, Stoke-on-Trent, and Mr. G.G. Ford, late of A.E.I. Limited, for critical discussion and proof-reading.

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Appendix I Job Specifications

a) Technical Director

<u>Title</u>	Technical Director
<u>Responsible to</u>	Board of Directors of the Exchange
<u>Grade</u>	Equivalent to British Scientific Civil Service, Principal Scientific Officer
<u>Minimum qualifications</u>	Chartered Engineer, with 1st Degree in Engineering or Technology. At least 7 years recent industrial experience, preferably over a wide technological field.

Scope of position

- (1) To establish an efficient modern communication system, embracing as wide a range of industries as is feasible, within his Region.
- (2) To provide all the Members of his Exchange, with a quick, reliable and accurate service for locating all types of capacity, and advising them of enquiries in their respective fields.
- (3) To act as an expert adviser to Industrial Development Councils.

Functions

(1) **Administrative**

- (a) Responsible for the efficient day-to-day running of the Exchange.
- (b) Select and train his P.A. to perform his (her) duties in an efficient manner.
- (c) To establish
 - (i) a file-card system for recording the machines and facilities of Member companies.
 - (ii) a catalogue and standards file.
 - (iii) a correspondence file.
 - (iv) a recording and checking system for telephone and Telex messages, letters and enquiries.
- (d) **Answering correspondence**

Functions (contd.)

- (e) Liaison with Government departments, professional bodies, Trade Associations, and other Exchanges, at home and abroad.
- (f) Planning and control of the Exchange's advertising.
- (g) Financial accountability.

(2) Professional

- (a) Building up the 'Machine File'.
- (b) Interpretation of enquiries.
- (c) Meeting the executives of industries in the Region.
- (d) Visiting the companies of his Members, to discuss problems.
- (e) The negotiation of licensing agreements.
- (f) Membership of local and Regional Productivity Associations.
- (g) Membership of Regional Economic Planning Council.
- (h) Publication of articles in specialist and professional journals.

b) Personal Assistant

<u>Title</u>	Assistant to the Technical Director
<u>Responsible to</u>	the Technical Director
<u>Grade</u>	(British) Scientific Civil Service, Asst. Exp. Off.
<u>Minimum qualifications</u>	Ability to type (80 wpm). Knowledge of engineering terminology. An engineering qualification (such as the British Ordinary or Higher, National Certificate) is desirable, but not essential. Experience of work with an industrial background.

Function

- (a) Typing of enquiry letters, general correspondence, reports.
- (b) Keeping up-to-date, all established records.
- (c) Keeping the day-book for telephone calls.
- (d) When fully trained, dealing with routine enquiries, in the

Function (contd.)

(d)(contd.)

absence of the Technical Director.

(e) Reception of visitors.

CPIR

CENTRAL
PRODUCTION INFORMATION
REGISTERS LTD

66 Station Road Alsager
Stoke on Trent Staffs England

ALSAGER 2748

THE CONTRACT shall be between:-

1. Central Production Information Registers, Ltd., hereinafter called "The Company" and a subscriber firm or company hereinafter called "The Member".
2. The Company agrees to compile a list ('The Machine File') based on information supplied by the Member of all his machines, equipment, processes and skills which he wishes to make available to other members, to keep the said list accurate and to amend it at any time on receipt of written instructions from the said Member, during the term of the Contract. No details will be put on the file without the prior approval of the Member.
3. When asked a specific question by a Member company about the particular means of production available, the Company undertakes to search through its files to find the member companies technically capable of carrying out the specified work or service. These will be called 'companies able' to do the work. The Company then communicates with these companies, to find those able and willing to do the work or give the service required, to be called 'companies willing'. These names are then communicated to the enquirer who himself approaches the companies of his choice. At no time is the identity of the enquirer disclosed to any of the 'companies able' to do the work.
4. The Company if it knows of a non-member firm wanting to place out work may, at its discretion, communicate to this firm the names of its member 'companies willing' to do the work. Similarly, the Company may give to an enquiring Member company the name of a non-member firm as a 'company willing' to do the work.
5. At no time will the Company prefer or recommend any one member firm rather than any other member firm, nor will it report to one member on the activities of any other member firm save as requested or approached by the member reported on.

Machine
File

Service
(Members)

Service
(Non-
members)

Impartial-
ity

- Information** 6. The Company operates this Service as a Centre for finding out those member firms apt to carry out a particular task at a particular time. At no time will the Company undertake to be responsible for the manufacture of a specific item.
- Secrecy** 7. The Company will not willingly disclose the details of the Machine File of any member to any third person, member or non-member.
- Non-warranty** 8. In no case does the Company warrant the quality or accept any responsibility for the work or service of any firm, member or non-member.
- Subscriptions** 9. Payment for the service set out above shall be by means of an annual subscription as set out in the Schedule below, and payable in advance.
- For the purpose of calculating this sum, the 'number of employees' shall be taken to be the total number of full-time employees of the Member company at the date of signature or renewal. No subscriptions or entrance fees shall be returnable.
- Renewal** 10. The Contract shall be for a period of two years from the date of signature and thereafter yearly until three months' notice of cancellation is given by either party in writing. Such notice to take effect on the expiration of the period of two years or any anniversary thereafter.
- No service will be offered to any Member who has not renewed his subscription within one calendar month of it becoming due. The Company shall however have the right to refuse to renew any Member's subscription.
- Refusal of Admission** 11. The Company shall have the right to refuse admission to the Scheme.
- Contra-vention** 12. Any contravention of any or all of the foregoing clauses will render the contract null and void.
- Office hours** 13. Enquiries will be dealt with between the hours of 8.30 a.m. and 5 p.m. Monday to Fridays, with the exception of the statutory holidays.

THE SCHEDULE REFERRED TO

<u>Number of employees (total)</u>	<u>Charge p.a. first year</u>	<u>2nd and successive</u>
1 - 49	£50	£40
50 - 249	£90	£75
250 - 1000	£150	£125

for over 1000 employees the charge shall be in the first year £300, in the second £250 and in the third and successive years by agreement between the parties.

IT IS HEREBY DECLARED that the number of employees employed by the Company at the date hereof is

AS WITNESS the hand of

on behalf of the Company and the hand

of

on behalf of the Member

this day of

One thousand nine hundred and

SIGNED by the said)

)

in the presence of:)

To..... **BANK LIMITED**

Please pay to **BARCLAYS BANK LTD., CREWE, NANTWICH ROAD (Code No. 20-24-12).**

for the credit of **CENTRAL PRODUCTION INFORMATION REGISTERS LTD.,**

the sum * of £ starting on 19

and thereafter **ANNUALLY**, until cancelled in writing.

* First payment only to be £

Address

Date 19

Signature of Member

2d.

stamp

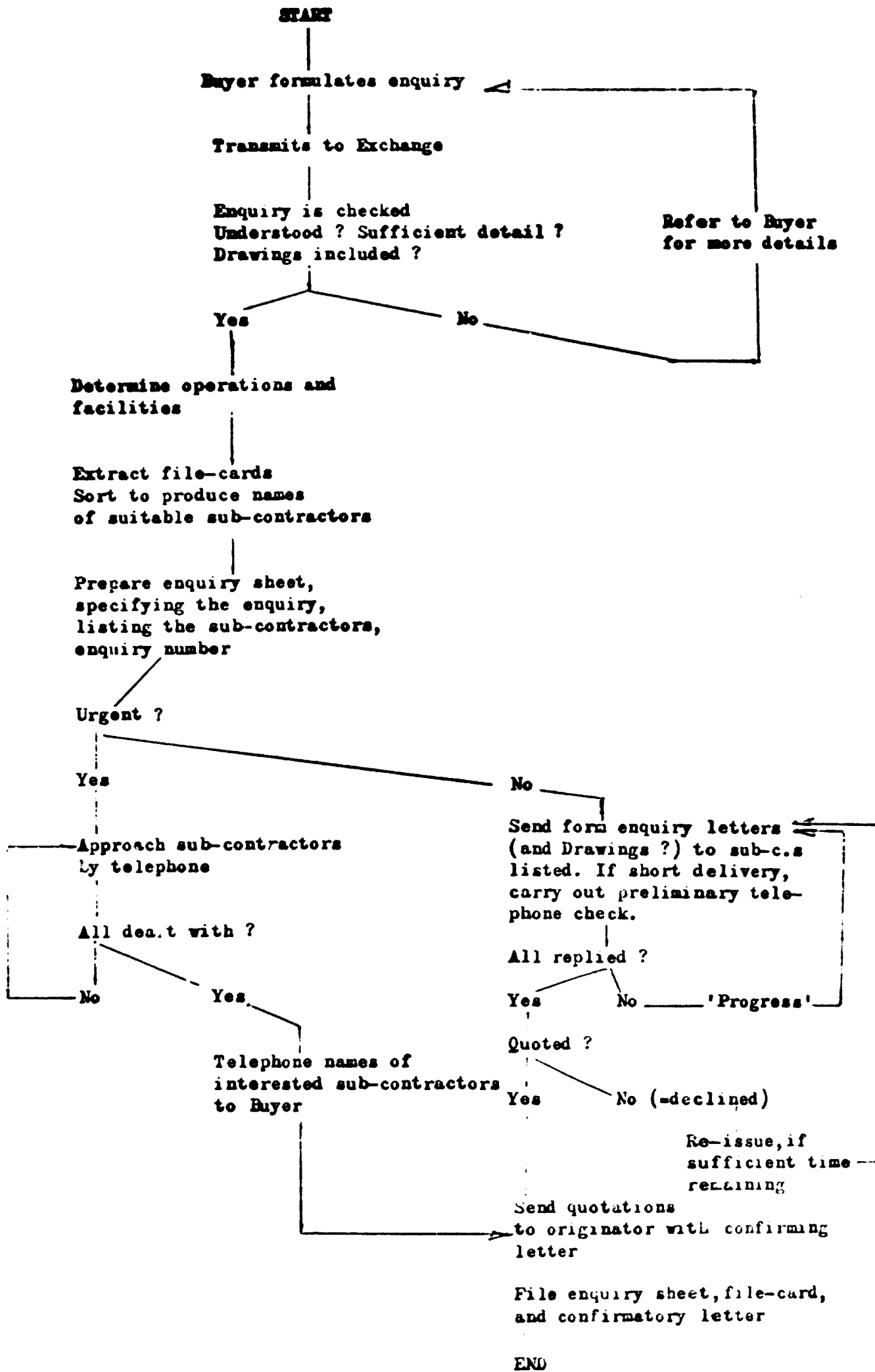
Appendix III

Enquiry file-card

<p>OPERATION</p> <p>MANIFOLDIA MARIBORI</p>										<p>SPARE</p>									
<p>AVAILABLE FROM</p>										<p>AVAILABLE TO</p>									
<p>PHONE NO. & ADDRESS</p>										<p>TELEPHONE</p>									
<p>HOURS AVAILABLE</p>										<p>POSITION</p>									
<p>1 2 3 4 5 6 7 8 9 1 11 12 13 14 15 16 4 2 1 7 4 2</p>										<p>WEEK TO</p>									
<p>OPERATION (large) No. of LOGS</p>										<p>No. of LOGS</p>									
<p>are being only of 4 Cent (small) rings to be used - 201-300 - used.</p> <p>are being of inside the outside diameter only. First ring for</p> <p>/c by the - diameter, the number of weekly intervals.</p> <p>direct to the director pres.</p> <p>the first of 1000 of. X 100 c/h</p>																			

Appendix IV

Enquiry Flow-Chart



Appendix V

Typical 'Machine-File'

Edge-punched card

This card records the specification of a 6 ft. Vertical Borer of Operational Code (BV) at the factory of company RTE.

The 'Y' punching shows that it is 'Machine-File' (= total capacity) and not Surplus Capacity, which would be punched in the 'X' slot.

The lower edge of the card can be used for logging surplus capacity, the 16 categories of 'hours available' being assigned to increasing groups of hours.

OPERATION

IV
 Vertical Borer
 Broadbent-Schofield, double-column, two-head type

60 Table Feeds (C) 1/8 to 1/144 i.p.r.
70 Swing Table speeds (12) 2 to 50 r.p.m.
34 Table/tool turret Measurement micrometer dials
42 Table/cross rail Motors 15-5-1-1 HP
27 Ram travel
20 Turret travel

MANIFOLDIA MANIPOLY

AVAILABLE TO

HOURS AVAILABLE

TELEPHONE

CONTACT

POSITION

FIRM'S NAME & ADDRESS

RTE

WEEK TO

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

1 2 3 4 5 6 7

SPARE

Y

X

A **B** **C** **D** **E** **F** **G** **H** **I** **J** **K** **L** **M** **N** **O** **P** **Q** **R**

1 **2** **3** **4** **5** **6** **7** **8** **9** **10** **11** **12** **13** **14** **15** **16**

1 **2** **3** **4** **5** **6** **7**

Appendix VI

References

- 1) B.O.T.U. Bulletin, Holland
- 2) 'Bolsas Sindicales de Subcontratacion', Spain,
Diciembre 1965 (Oviedo, Sevilla, Valencia, Zaragoza)
'Las Bolsas de Subcontratación y la Concentración de Empresas'
Abril, 1968 (Asturias)
'Estatutos' (Bolsa Sindical de Subcontratacion de Zaragoza)
- 3) 'Engineering Capacity Registers' P.L.M.A. Leaflet 805, 25.4.67
- 4) 'The Sub-Contractor's Exchange of Sveriges Mekaniörbund', Sweden
'Mekanförbundet Underleverantörbörsen' 18.9.68
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(RijksNijverheidsDienst, R.N.D.)
- 6) The Engineering Industries Association (E.I.A.)
'Engineering Capacity and Export Gazette' and 'P.A.S.S.'
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- 7) 'Les Bourses de Sous-Traitance-facteurs d'amélioration de la
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- 8) 'In favour of a rational sub-contracting policy' Robert Holtz
'Joint Activities-a policy of adaptation for small and medium
sized businesses to the new forms of market-scale economy'
Robert Holtz, C.E.R.T.E.S., Paris (translations)
- 9) 'Pour une sous-traitance productive' Supplément N° 710, juin 1967
of 'Les Industries Mécaniques' hebdomadaire officiel, FILTF, Paris
- 10) 'The Innovators-the Economics of Technology' Michael Shanks,
Pelican Books, 1941, 1967
- 11) 'Can Economies of Scale be Shared' District Bank Review Sept. 1968
'The Small Firm-Problems and Possible Solutions' Martin Rudd (both)
Westminster Bank Review, May 1967
- 12) 'New Technology' (Ministry of Technology, U.K.)
'Salesmen for technological progress' No 10, Oct. 1967,
'Simple automation techniques win followers in Industry' No 21,
October 1968
'Productivity Services for Industry' No 19, July 1968

Appendix VII

List of Organisations

- 1) Bolsa Sindical de Subcontratación, C.N.S., Trajano, Sevilla, Spain
(Francisco Gentil Palomo, Director Técnico)
ViceSecretaria Nacional de Ordenacion Economica, Sección
Regimen de la Empresa, Paseo del Prado, 18-20, Madrid, 14
(Don Vicente de Mingo, Coordinador, Organizacion Sindical)
- 2) Bourse de Sous-Traitance de L'Est, 2 rue Girardet, Nancy, M.M., France
(M. Claude Cuny, Directeur)
- 3) The Engineering and Building Centre, Broad Street, Birmingham, 1
(Mr. Allen Plaskett, Chief Sales Executive)
- 4) The Engineering Capacity Exchange and Associates, 31, Queen Anne's
Gate, London, S.W.1 (T.E. Lucas, Director)
- 5) The Engineering Industries Association, North-West Regional Office,
178, Corn Exchange Buildings, Fennel Street, Manchester, 4
(Mr. G. Aplin, Secretary)
- 6) Federation des Entreprises de L'Industrie des Fabrications
Metalliques (FABRIMETAL) 21 rue des Drapiers, Bruxelles, 5
M. C. Carbonnelle, Conseiller Économique)
- 7) Federatie Metaal-en Electrotechnische Industrie, Economische
Afdeling, Nassaulaan, 25, 'S-Gravenhage, Holland. (A. Lagendijk)
Stichting Bevordering Onderlinge Toelevering en Uitbesteding, DOTU,
Soestdijkseweg, 246 Zuid, Bilthoven, Holland. (Mr. Ir. A. Bos, Man. Dir.)
- 8) Ministry of Technology, Abell House, John Islip Street, London, S.W.1
- 9) Production Engineering Research Association, PERA, Melton Mowbray, Leics.
- 10) Sveriges Mekanförbund, Commerce Department, Artillerigatan 34,
Stockholm, 5 Mr. Sten S. Henningsson
- 11) Union d'Action Internationale P.M.E., 18 rue Fortuney, Paris, XVII^e
(M. Robert Holtz, Le Délégué Exécutif de l'Union d'Action Internationale)
- 12) Union of Chambers of Commerce, Industry and Commodity Exchanges of
Turkey, 149, Ataturk Bulvarı, Yenisehir, Ankara, Turkey
Namik Kemal Savun, Secretary General
- 13) Verein Schweizerischer Maschinen-Industrieller, Kirchenweg 4,
Zürich. (Dr. A. Sauer)

Appendix VIII

U.K. and European Exchanges

This is not an exhaustive survey of all the Exchanges in the U.K. and Europe, but indicates briefly some of the different types of Sub-Contract Exchange now operating. The numbers in brackets refer to the organisations listed under Appendix VII.

**U.K.
systems**

The E.I.A., with several Regional Offices, publishes at regular intervals, information on capacity, materials, export opportunities, etc. (5) ('Engineering Capacity and Export Gazette', national, fortnightly; 'P.A.S.S.', Products, Capacity Available, Services, Supplies, Regional, every three months) There are frequent meetings when Members can exchange capacity information, and they can also approach the nearest Regional Office, if the enquiry is urgent.

The Engineering, & Building Centre, operates a free service, which since 1953, advises enquirers of the location of specified capacity. (3) Its income is derived from the use of its premises for exhibitions and displays by manufacturers and sub-contractors. It is administered by a Council representing local interests, and operated by a Chief Sales Executive and staff.

The Engineering Capacity Exchange, founded in 1963, is an independent organisation, very similar to CPIR in operation. (4) Users pay a nominal fee, and sub-contractors pay for work received on a sliding-scale commission basis.

**European
Exchanges**

In 1965, the Sveriges Mekanförbund set up their Exchange in Stockholm. (10) By early 1966, the system embraced all the Scandinavian countries. Members advise their national organisation of their capacity available, and of their capacity demands, on a regular monthly basis. This information is collected and analysed to produce the monthly bulletin, 'Mekanförbundets Underleverantörbörser'. This lists on the cover, available capacity, under 19 categories. Each sub-contractor is

Appendix VIII (contd.)

assigned a code number, which also refers to more detailed information on his capacity inside the bulletin. Any Buyer wishing to make use of advertised capacity first approaches the national parent organisation, which advises him of the identity of the company. The operating cost is not budgeted separately, but is part of the commercial departments of the parent organisations, which are financed by their Members' subscriptions.

In Holland, in 1963, the Federatie Metaal en Electrotechnische Industrie, FME, established their B.O.T.U. Foundation, which is run on a subscription basis. Sub-contractors make available to the Exchange, details of their capacity, and prospective Buyers approach the Exchange, which, from its detailed files, can advise them of where this is available. It is interesting to note that, under their 'General Conditions', Buyers are required to advise the Exchange of the outcome of the enquiry.

In France there are several Exchanges, notably the user-financed autonomous Exchanges, at Clermont-Ferrand, Dijon, Nancy, Nantes and Tours. They are effectively organised and highly developed. In addition to carrying detailed total capacity information of their members, they operate a Surplus Capacity information system, on a renewable monthly basis. They also offer a Technical Information Service to their Members. We have several times used the very efficient services of the LSTE, Nancy, to locate European sub-contractors or suppliers for our clients.

In Spain, there are five Exchanges, in Oviedo, Bilbao, Seville, Valencia, and Saragossa. The Exchanges are supported by the Employers' Unions, and financed by their Members' subscriptions. They are closely patterned on the BSTE, Nancy. Although concerned mainly with mechanical engineering, they are considering extending their services into other fields, such as wood-working, chemical engineering, and building construction.





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