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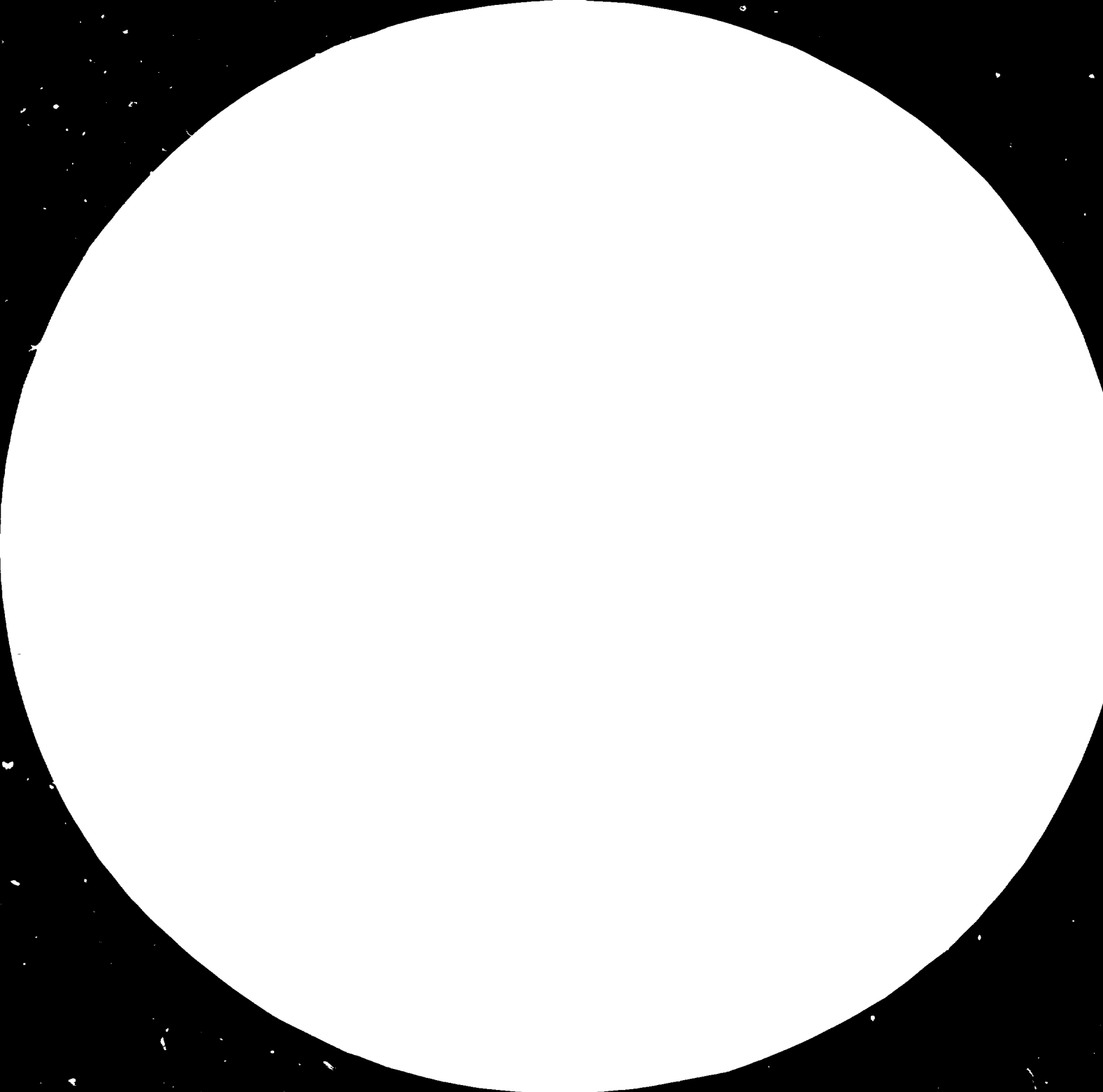
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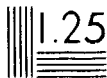
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EXPERT IN THE PRODUCTION OF FURNITURE

DP/CYP/80/006

CYPRUS

Technical report: Assistance to the furniture industry*

Prepared for the Government of Cyprus
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of R. H. Glossop,
expert in furniture design and production

United Nations Industrial Development Organization
Vienna

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1. Forward

1.01 The first assignment of the expert R.H. Glossop as adviser in furniture design and production to the furniture industry of Cyprus was under the auspices of the Commonwealth Fund for Technical Co-operation (C.F.T.C./PER/EXP/426). This began on 10 March 1977 and was completed on 10 August 1980.

1.02 Following this assignment a new project document (CYP/80/006/A/07/31, under the auspices of the United Nations Development Programme) was prepared. This project commenced on 1 September 1980 and terminated on 31 March 1981.

1.03 The present report is concerned with work done by the expert during the second project period of seven months. Short recommendations and conclusions are given. Annexures to the report are attached with details regarding these.

2. Introduction

2.01 The duties of the expert are defined in the Post Job Description featured in Annex 1. The project objectives were the same as those in the C.F.T.C. project assignment and were specifically directed towards:

- (i) Reducing the direct labour costs in furniture products.
- (ii) Improving the design and quality of furniture products.
- (iii) Improving the utilization of skilled labour.
- (iv) Making greater use of unskilled labour.
- (v) Reducing materials costs in furniture products.
- (vi) Reducing the cost of surface finishing of wooden furniture products.

whilst the immediate demands of the project objectives were the main concern during the six months duration of the project. The general approach to the assignment continued to be that which had been the pattern on the previous assignment where the experts

activities were divided up into the following tasks:

- (i) Continue to supply information on furniture design and production to the technical information service previously set up by the expert in order to answer specific questions from the industry on furniture processes and information on the selection of plant, machinery and equipment.
- (ii) Continue to prepare technical articles for the Journal of the Ministry of Commerce and Industry of Cyprus on subjects of immediate interest to furniture manufacturers and on which enquiries had been received. For a list of these see Annex 2.
- (iii) Continue the technical training of instructors foremen and supervisors to recognized standards of the City and Guilds of London Institute in all furniture subjects. The Certificate Courses of training held were No. 835 Wood Machinery, No. 555/3 Advanced furniture studies and No. 836 Cabinet Making. Seminars were also held on furniture finishing and the equipment and materials involved. Although courses were planned for Upholstery, both for hand methods and industrial upholstery, and chair-making it was not possible during the period of the project to hold these due to administrative difficulties.
- (iv) Continue industrial activity primarily concerned with assisting in the solution of day-to-day problems of the furniture manufacturers. This included the design and preparation of new factories, their layout, selection of equipment and machines, organization of processes and production lines.
- (v) Continue furniture design activity. The immediate objectives of this work being to provide suitable furniture products for export which were to the requirements of the importers. This consisted of more technical aspects of furniture design than visual and more reproduction English antique furniture and Cyprus style pine furniture than modern furniture. There was greater demand for these types of product.

3. Background

The present number of registered industrial units manufacturing furniture on the island is about 523. The skilled labour force is currently 2,000. The remainder of this labour being unskilled with no formal training in furniture production other than what they acquired in furniture factories as process workers.

The furniture industry association with whom these companies are registered is 'The Association of Wood Industries', Nicosia. However, 'The Industrial Employers Association', Nicosia looks after the legal aspects of the industry. As there is also an 'Association of Joiners' which is distinct from that of the furniture manufacturers, not all wood industries come under the domain of the Association of Wood Industries. Also, many joinery companies in addition to their normal work make certain types of furniture products such as kitchen cabinet units and interior fitted cabinet furniture.

The value of gross production in 1974 was C£ 7.5 million and in 1978 was C£ 7.9 million. Exports in 1974 were C£ 29,000 and imports for the same period was C£ 700,000 whilst exports in 1977 were C£ 448,454 and the imports C£ 516,784. Exports have risen appreciably each subsequent year but official statistics appear to provide figures that are lower than they actually are.

The statistical data issued by the Ministry of Finance does appear to differ very considerably from the actual known values and particularly in relation to export values. This question has already been discussed with senior members of the various ministries and the Planning Bureau. It would seem that the reason for this difference is the sources from which the information is obtained.

The local demand for furniture fell due to the economic situation in the country after the events of 1974 resulting in a lowering of the standard of living.

There are good prospects for the export of furniture particularly of the 'knocked' down modular variety and reproduction antique English furniture due to the relatively low labour costs in Cyprus and the cheap freight rates from Cyprus to the Near and Middle East,

North and East Africa and Europe. In order to exploit economically the situation it was necessary to provide for better design both visual and technical and more particularly to improve methods of production. It was also necessary to improve the present skills and the processes to meet the requirements of these markets.

The expert has been working in the Cyprus furniture industry for the last four years and much ground has been covered. Exports of furniture products have risen steadily from the commencement of 1977. To improve on the figures more skilled labour is required and more sophisticated and automatic equipment. Some furniture factories have carried out these improvements with the assistance of the expert.

4. Initial Appreciation

The situation in the Furniture Industry in Cyprus as it existed at the commencement of the project in March 1977 is contained in a report prepared by the expert. "A Sample Survey of Furniture Manufacturing Companies in Cyprus - Summary of Findings". May 1977 (See Appendix 2, List of Publications). This indicated what had to be done to correct the then prevailing situation.

The findings can be summarized as follows:

- (i) Inability of producing any one furniture product in large enough volume to meet the requirements of export orders.
- (ii) Inexperience in accurate product costing.
- (iii) Inability to maintain consistent quality standards.
- (iv) Little attempt to meet export design requirements.
- (v) Lack of knowledge of certain basic furniture manufacturing processes which produce features in the furniture product that contribute value in the eyes of the consumer.
Examples are furniture finishing, dovetailing, scribing of tenon shoulders, to name only a few.

However, the majority of the more established furniture companies have overcome these problems and are now exporting in considerable volume especially to the United Kingdom, Saudi Arabia, Spain and to the Gulf States. It has always been the expert's policy to persuade a furniture company to start exporting a simple furniture product

early in the company's reorganization. Now there is no lack of export orders, but the real problem still remains that of producing in the necessary volume and quality.

5. Elements of the Assignment Approach

With reference to the job specification (Appendix 1) it was quite evident at the commencement of the assignment that if all the requirements of this job specification were to be completed it would be necessary to proceed on a broad approach to the work. To fulfil the requirements of the assignment the experts activities were therefore divided up into the following tasks:

5.01 Organization of an information service

Details of all machinery, equipment, materials and processes pertaining to the furniture industry were obtained from all the recognized sources in Europe and Scandinavia and were filed. It was necessary to do this because of the lack of such information in Cyprus and to reduce the hazards experienced by individual furniture manufacturers when dealing with importers who had little knowledge of their requirements nor of the equipment they were importing. The information enabled the furniture manufacturers to collect the details of any particular range of machines from which to select the most appropriate one for their purpose and available finance. The range of processes included both details of the traditional hand methods and the more sophisticated industrial processes.

Organizational methods and procedures had to be introduced to see that this information did not disappear from the files and that the information was kept up to date. Considerable use was made of this information by furniture manufacturers who were now able to make their own decisions instead of being influenced too much by importers of machinery, equipment and supplies. Furniture manufacturers previous experience with importers had been unfortunate. Many importers had delivered to their factories machines of the type they did not order. Some had experienced the situation where no installation guidance was given for highly sophisticated automatic machines with logic circuits. Operation manuals were

given in a foreign language which the manufacturers could not understand, 'new' machines delivered were subsequently found to be second hand. The information service went some way to rectify this situation.

5.02 Technical Publications

As the result of the lack of suitable available literature on many areas of furniture production and the demand by manufacturers for some immediate guidance on many areas, either in connection with actual problem solving in the factories or in connection with seminars, articles on these problem areas were prepared by the expert and contributed to the Journal of the Ministry of Commerce and Industry. In addition a number of booklets were also prepared on such subjects as 'Furniture Product Costing', 'Furniture Surface Finishing', 'KD' Furniture Construction' and also production studies for certain items of furniture. These publications were very much appreciated by the industry and instructors and first printings were soon exhausted. For a list of these publications prepared during the period of the expert's assignment from early 1977 to 1981 see attached list (Appendix 2).

5.03 Training of Personnel

Because of the scarcity of trained personnel in all aspects of furniture production and design, it was necessary to train individual personnel to a recognized standard in each area of furniture production, so that this personnel would be able to pass on this information to apprentices and other production operators either in the factories or on subsequent courses which they would conduct themselves. This technical training was carried out on all evenings of the week excepting Thursdays, Saturdays and Sundays from 16:00 hours to 20:30 hours. Each course involved both lectures and practical work in the workshops. The participants on each course ranged in number from 24 to 28 persons and were mostly from industry, but there were always a few instructors from the Technical Schools of Nicosia, Larnaca, and Limassol, who wished to obtain the City and Guilds of London Institute Certificates in

the particular furniture subject. They also wished to obtain the printed course material prepared by the expert and a understanding and interpretation of each individual syllabus, and details of the set practical projects.

Two courses for the number 835 City and Guilds Certificate in Wood Machining each lasting an academic year were completed in 1978-1979 and 1979-1980. All the students passed, many with credit and distinction. The number 555/3 City and Guilds Certificate Course in 'Advanced Furniture Studies' was also held in 1979-1980. The students for this sat their examination in June 1980 and all passed with distinction. The course number 836 City and Guilds Certificate in 'Cabinet Making' was held in 1980-1981. The students take then examinations in May 1981. It is expected that all students will pass and obtain this certificate with creditable examination grades.

It was not possible to conduct City and Guilds Courses in 'Chair Making' or 'Upholstery' due to lack of time and the administrative details which demanded preparation of printed course material, obtaining materials necessary for each course from interested industrial companies, who were prepared to denote these materials, the storage and safe-keeping of these materials and the selection and enrolment of the participants. However a lengthy waiting list of prospective students for these courses has already been received.

In addition to the above courses for City and Guilds qualifications held at the Technical School, Nicosia, individual seminars were held in furniture factories on various furniture subjects, particularly aspects of furniture finishing and equipment. Other furniture manufacturers attended these seminars at the invitation of the furniture factory owner.

5.04 Industrial Activity

Advisory work in furniture factories consumed most of the assignment time and ranged over all aspects of furniture production and design. This activity was also most exacting as very detailed

explanations had to be given to justify the various alternatives suggested to meet the solution of a problem. Such things as kilning and the procedures for the air seasoning of timber, the stoving of wood finishes, attachments to existing equipment and machines, plant and factory layout, selection and operation of wood working machinery, difficulties with processes, to indicate only a few aspects of the expert's work in this field. On occasions practical demonstrations had to be carried out to enforce these suggestions. The total number of new factories set up so far are twenty five in number. There are always six new factories being moved from old locations to a new site and their reorganization from jobbing shop to economic batch production. Many of the factories already reorganized compare very favourably with their European counterparts. Many of these larger factories are the result of co-operative ventures where a number of small companies have amalgamated successfully.

During the past seven months over one hundred visits to furniture factories have been made to assist manufacturers in their problem solving. In all cases satisfactory results in the opinion of the manufacturers have been achieved.

5.05 Furniture Design

The main objective of the design activity was to produce furniture products acceptable to export markets. This activity therefore tended to be directed towards meeting market requirements such as exfactory price, desired features, 'KD' assembly and packaging instead of fundamental design. But in addition there was always an emphasis on appropriate quality standards and all technical aspects of the design. 'KD' assembly was soon seen to play an important part in the design of most furniture products not only for ease of container transport and distribution to market areas, but also to reduce the assembly time in the factory, which can often be sixty per cent of the labour time of the product. With the scarcity of skilled labour this has contributed to a greater volume of production in consequence of a lower product labour cost and the greater employment of unskilled labour.

By reason of the fact that there are a number of good furniture designers in Cyprus, many of whom were trained at the Royal College of Art in London and other design centres in Europe, the expert's design activity was assisting these designers in an advisory capacity. Whilst they were competent visual designers they lacked the technical knowledge of furniture production, which they freely admitted. However the results have been very acceptable to export markets and now the industry is designing for simplification and standardization of product lines in order that labour may be used in a more efficient manner and greater output obtained in consequence. One of the disadvantages experienced by individual furniture companies embarking on fundamental design activity is that other furniture manufacturers will quickly copy a successful design at a cheaper price, usually at the expense of the quality standard or by accepting a lower profit margin on that particular article. As many furniture manufacturers in Cyprus have copied practically every furniture product produced by furniture industries all over the world, frequently with highly commendable results, they are thus highly adept at copying.

Furniture manufacturers have been advised to specialize in certain furniture products of their choice in order to obtain identification both with respect to type of product and quality, and to achieve greater efficiency in production. Lower furniture product costs by economic batch production, introduction of more high production and specialized plant and equipment and so achieve greater volume of production for export. By doing this some furniture companies were able to reduce the labour content in their specialized products to an absolute minimum.

Invariably the specialization selected was based upon a company's past skills and experience. The results of this policy was that it soon became apparent to furniture manufacturers that it was no use competing against a company specializing in the manufacture of a particular furniture product. Thus it has become the practice for the purchase of furniture products made by another company who has specialized in this product to make up contract orders.

Quite apart from the various factors which have influenced this development the continued lack of skilled labour made this action a necessity. This specialization has resulted in many furniture companies having a production organization which now compares very favourably with their European counterparts.

However some furniture manufacturers are reluctant to organize their complete production for a single type of furniture produce, for whilst this enables them to compete in export markets on price but with smaller profit margins when compared with the Cyprus home market, this policy leaves them very vulnerable to undercutting on price by a competitor on the Cyprus home market. As the manufacturer on the Cyprus home market is his own retailer the retail mark up on furniture products is quite considerable when compared with the material and labour cost of the product. A competitor will accept very little or next to no profit on a particular furniture product but make up the loss by increasing the mark up on another. As the present mark up is extremely variable when compared to the material and labour content of furniture products (see Appendix III - Sample Cost Analysis of Furniture Products) the company who specializes in certain furniture products can often be nearly put out of business. The only exception appears to be chair production which is very specialized in skills and required expensive high production equipment.

Another factor that serves as an influence against specialization is the practice of apartment and hotel owners to place the furnishing of these buildings in the hands of one furniture manufacturer.

The reason for this is that if the contract is spread among a number of manufacturers the problems of delivery arises. The furniture company who specializes would therefore not be able to avail himself of such contracts where there is considerable opportunity for profit. But although the building boom has been considerably reduced there seems no sign for the foreseeable future of a reduction in the building of hotels and apartments.

The result of this influence is that whilst many furniture manufacturers specialize in one product they also make all the other range of furniture products in a separate cost centre.

6. Training of Counterparts

At the commencement of the assignment period in Cyprus - March 1977, the Ministry of Commerce and Industry appointed a counterpart who was not a furniture specialist but a trained mechanical and production engineer to assist the expert in industrial work and its administration. He had to be trained by the expert in all aspects of furniture production and its processes. However after two years he left the Ministry to become the manager of a furniture factory specializing in the manufacture of kitchen modular furniture which he was responsible for setting up and operating. Another counterpart replacement was appointed and the training began again.

With the start of the technical training courses a second counterpart was appointed by the Ministry of Education to assist the expert in the organization of the furniture courses. This second counterpart was a woodworking specialist and as he attended all the courses run by the expert he was trained in all the course subject matter, the syllabi, their interpretation and the organization of the practical work and the set projects. The arrangement in both cases has worked quite well. The amount of administration connected with both aspects of the assignment made this arrangement of two counterparts a necessity.

7. Review of the Existing Apprenticeship Scheme

The expert was requested to review the existing furniture apprenticeship training scheme by the Ministry of Education and the Ministry of Commerce and Industry. But due to the length of the assignment extension it was not possible to do this. However the problems faced by this scheme are similar to those experienced in Britain in the 1950's and would be easy to correct.

7. Review of the Existing Apprenticeship Scheme Cont.

The problems faced by the apprenticeship scheme are similar to those experienced in Britain in the 1950's for the following reasons:

- (i) Because the lecturing and instruction is the lowest grade in the teaching profession the best instructors and lecturers, now depend on higher grade teaching for promotion, naturally gravitate towards higher grade work to obtain possible promotion. Thus the best of the teachers are not used to train apprentices. The quality of the instruction of teachers therefore tends to be somewhat limited, the instruction in a subject is long drawn out with laborious board work with the writing down of what is written on the board by the students occupying most of the apprentices time and little in discussions. The apprentices naturally as a result become somewhat disinterested in the subject matter. This is not to say that in some instances even with this system quite remarkable results are obtained. The training of apprentices naturally demands the best obtainable teaching methods comparable to the old T.W.I. (teaching within industry) methods which was expanded in Britain during the 1950's to improve the system of operator instruction and influence technical school teaching.
- (ii) The appropriate technical content of the instruction left much to be desired. This was brought about by there being too few qualified lecturers available to give instruction in the right subject matter. There was no relevant examination in the furniture subjects or an adequate syllabus for these subjects. The result of this was that lecturers were recruited to fill in time to instruct the apprentices in out of the way subjects such as astronomy, history, politics, sociology, etc. which was justified subsequently by an argument for 'general studies'. This practice made the apprentice somewhat discontented as he could not see the relevance to his future job in industry of the subjects. Measures for the training of instructors were introduced to improve the technical content of apprentice instruction and the City and Guilds of London Institute introduced syllabuses and examinations for furniture subjects which gave apprentices an objective to obtain qualifications. These covered every aspect of furniture studies.

- (iii) In Britain there was a scarcity of suitable instructional manuals in the 1950's. Those that were available were for joiners of builders and not for the furniture industry. In Cyprus instructional manuals were prepared for those furniture courses conducted by the expert. These were used in the training of the instructors and were subsequently available to assist in the instruction of apprentices so as to reduce the board work by the instructors and the laborious copying down by the students of what was written on the board and the associated diagrams. This provided more time for discussion within the total number of hours allocated to the subject.
- (iv) The apprenticeship scheme in Britain during the 1950's was further improved by the introduction of what is called a 'Learnership Committee' on which were represented members of management, union, and educators actually involved in the training of apprentices. Its main function was to oversee the quality of the instruction in the colleges in the area. It also recorded the commencement of an apprenticeship and on its completion decided if the appropriate standard had been reached by the apprentice for him to become recognized as a 'journeyman' or trained worker, who would thus be able to obtain the higher hourly rate of pay. Previously it was to the advantage of management to prolong the apprentice period, which often developed into conflict between the union and management. In addition the committee was a means whereby the quality of the instruction at the local technical school could be questioned and pressure exerted to improve or rectify the day release activity.
- (v) The effectiveness of the apprenticeship scheme was reduced by the non-availability of resources, such as the use of a machine shop, cabinet or chair making shop, and equipment, because of the demands on these resources by the full-time students of the college, who were nearly always given preference. This became a problem in Britain in the 1950's with the organization of the apprenticeship scheme. As most of the technical schools were originally built to meet the requirements of the local industry it was natural that pressure was exerted for these technical schools to release more of these resources for the day release apprentices. These schools were reminded that whenever the school required more equipment and resources it always appealed to the apprentice interests to obtain these, but on obtaining these the interests of the apprentice were invariably forgotten. However the learnership committee was instrumental in reviewing this question and seeing that an appropriate release of resources for the apprentices was made available.

8. Immediate Objectives of the Project

8.01 To reduce the direct labour costs in furniture products

With the preparation of a manual 'A Method of Establishing Furniture Production Costs' in 1977 a simplified method for the correct costing of direct labour on factories was begun. This was also supplemented by production studies. When actual labour costs were determined this caused considerable alarm with furniture manufacturers. Methods were immediately introduced to reduce these costs by the elimination of unnecessary work particularly in assembly work and surface finishing. It was soon seen that fitting assembly as against selective and interchangeable assembly was wasteful in labour time. The introduction of 'KD' fittings eliminated assembly time in the production of certain types of furniture. The simplification of construction and the introduction of improved methods of production increased productivity and reduced the incidence of hand work. In one particular furniture factory the labour costs were quickly reduced by twenty-five percent.

Simple production controls to reduce the operators unproductive activities were introduced. In the past because each furniture manufacturer was his own retailer he could absorb the cost variations in the considerable profit margins added to the ex-factory cost of each product. Some products obtained little profit margin whilst on others a large profit could be obtained. Manufacturers soon saw that it was necessary to introduce adequate product costing as a control to know just how much profit was in fact being made. For the success in selling a particular furniture product might mean that the manufacturer was under pricing his product. Because of the previous lack of accurate costing there was a reluctance on the part of the manufacturer to specialize in one type of furniture and forego the opportunity of balancing the profit margins of a wide range of profits. Economic batch production was soon seen to have its advantages in reducing labour costs.

The introduction of the simplified product costing system convinced the manufacturers of the savings likely to be obtained by specialization and economic batch production with respect to direct labour costs.

8.02 Improve the quality and design of furniture products for export

By reason of the prevailing trend of copying every furniture design that is successful, at a lower selling price, the average furniture manufacturer is reluctant to embark upon any major exercise in product development. This continual copying to achieve a lower selling price is invariably at the expense of quality standards. However technical furniture design whose purpose is to introduce new methods, improve quality, lower labour and material costs is much sought after and much work in this field has been done by the expert.

The designs that are exported in large quantities are those that foreign importers have requested. These are invariably traditional Cyprus designs in pinewood for which it would seem there is considerable demand in Europe. It is little wonder that little or no effort is shown to launch new designed products on the export markets. Although simple test marketing markets are interested in what original designs the Cyprus furniture manufacturer can produce. This has contributed in some degree to a desire to make individual designs but they are aware of the prevailing disadvantages. Manufacturers are conscious of the necessity of improving and maintaining quality standards but there is a tendency sometimes due to ignorance of ignoring the most important quality features of a furniture product. Much very acceptable furniture is spoilt by lack of attention to these features.

As it is mentioned elsewhere in the report, the features to which attention should be paid are numerous, but some examples might indicate the type of feature which is not

compatible with certain furniture products.

- (i) Plastic fittings are not appropriate for what would otherwise be a good quality item of cabinet furniture. Metal fittings which are easily obtainable would be more appropriate and contribute value to the product in the eyes of the consumer.
- (ii) What would otherwise be an excellent item of cabinet furniture both in appearance and quality is spoiled by bad drawer construction. The use of nails on drawer sides instead of dovetail joints reduces the value of the cabinet in the eyes of the consumer.
- (iii) A good quality item of cabinet furniture should have the appropriate drawer pulls, hinges and other fittings. To incorporate fittings that are associated with kitchen cabinets into what would otherwise be a high quality cabinet reduces the quality of the item of furniture. The purchaser looks at these things first and will judge the quality of the complete job by these. Furniture manufacturers therefore pay particular attention to these and always obtain the best quality and also the appropriate visual quality to enhance the product.
- (iv) Without going into the construction of furniture it should be remembered that certain methods are associated with lower cost products, and if quality furniture is the objective, then certain constructional methods will have to be built into the product. For example lipping should be covered with veneer right up to the edge and not just glued onto the edge of a veneered board as this is associated with cheaper furniture, such as school furniture, etc.
- (v) It is obvious if considerable labour time and good materials have been built into a furniture product to obtain an appearance of quality, it is unfortunate if another part of the product incorporates features which are associated with lower quality. For example, a good quality construction can be marred by a poor cheap finish. The product could have been enhanced if an appropriate surface finish had been applied. The difference between the two finishes would have been marginal in cost.

The above points equally apply to all types of furniture whether cabinet or chairs and upholstery. Much could be

written on this as guidance to manufacturers, but it is a matter of common sense, knowledge of product development and marketing, to obtain this compatibility.

Much of the furniture that is imported from the European Economic Community is of good visual appearance but of very poor quality. But manufacturers who import it state that it is exceptionally cheap and sells. It would be disastrous for the Cyprus furniture industry for it to compete on price with these imports and come down to the same poor level of quality. This would have a very serious effect on the overall quality standards of the Cyprus furniture industry, particularly with regard to the encouragement of skilled furniture workers.

Whilst some producers of upholstered products have a very high standard of quality the majority produce upholstery of poor quality not so much from the outside visual appearance but from the internal upholstery construction. The appearance of the product copied from illustrations in magazines and brochures does not indicate how the upholstery effects were obtained by internal construction. The result is that the appearance has been achieved by an excessive amount of labour and material which is costly or the internal construction is skimped with the inevitable result that in a short time the internal upholstery will break down. Manufacturers state that they do not make as much profit on upholstery as they do with other furniture.

It was hoped that the expert would hold an upholstery course to go with the others and in this way help in correcting this situation but this was not possible due to the short time.

8.03 Improve the utilization of skilled labour

With the scarcity of skilled labour in the Cyprus furniture industry it is necessary to see that measures are taken to utilize these skills more effectively. Simple activity sampling studies carried out by the expert have indicated that skilled labour is only forty percent effective and that sixty percent of their time is spent in unproductive activities. Management is therefore paying five days wages for two days work.

It is reasonable for skilled workers to achieve a productivity of at least seventy percent and with the introduction of a simple system of labour cost control, which accounts for every minute of productive work, ineffective or unproductive time can be discovered and action taken to reduce this if not eliminate it entirely. Unproductive activities are all those things that do not make a contribution to the end product, and for skilled direct labour to have to do them is a waste of skilled labour. Examples are waiting for and finding out details of the next

job, looking for materials, rectifying defective components, attempting to correct break downs of equipment or machines, seeking instructions, unloading timber from a lorry, sweeping the floor, to indicate only a few examples.

Manufacturers were soon aware that measures would have to be taken to reduce this unproductive time if not eliminate it completely in order to make this skilled labour more effective.

Management in leading furniture companies agree with the percentages but naturally ask what can they do to reduce this unproductive time. Measures were suggested to them by the expert that could contribute to this reduction.

Ideally it is easier to exercise the necessary controls if the furniture company is on batch production as against jobbing shop production. But the difference in terms of cost had to be brought home to manufacturers. Jobbing shop production in Cyprus has a labour cost three times that of the material cost of a furniture product and in batch production labour cost is a half that of the material cost of a furniture product made by that method. It can therefore be seen that in jobbing shop production more labour is required for the manufacture of a furniture product than with batch production and in addition greater skill in the labour force is required in jobbing shop production. Whereas comparatively unskilled labour may be used in economic batch production.

However in both types of production the effectiveness of skilled labour is only forty percent but in carrying out their tasks they are working at a good standard performance. Much of this unproductive activity carried out by skilled workers is of an unskilled nature and it is work which can be best done by unskilled labour. The immediate measures that can be taken is to employ unskilled labour to help the skilled worker do the fetching and carrying and the materials handling. Management and supervision should introduce simple organizational controls to control this unproductive work.

As a result of the general scarcity of skilled furniture makers and machinists there is a tendency for individual furniture manufacturers to poach skilled workers from each other by the use of various inducements. Many skilled workers are attracted by the high wages in the Arab countries and leave Cyprus to take up work in these areas. However, a number of Cypriot furniture manufacturers use various devices to retain skilled labour and are successful in doing so. The result of all these influences is that the skilled worker benefits from this situation, if he does not go into business for himself and set up his own furniture company.

But the basis for correcting this situation is still the introduction of more efficient methods of production which reduces the skilled worker content in many manufacturing operations.

8.04 To make greater use of unskilled labour

It is evident that as well as the question of the effective use of skilled labour the same is true of unskilled workers who due to poor supervision are never where they are wanted. In some furniture factories this factor is realized and the necessary controls are operated.

It is possible to train reasonably intelligent workers not necessarily those who have any background skills in furniture production, to carry out particular repetitive operations and accept responsibilities for a certain series of activities. Many production operations on which a worker is continually employed can easily be operated by a person trained only in this activity. It would be a waste of skilled labour to have such a person continuously tied to this one operation.

Production activities can be divided up into 'make ready', 'Do', and 'put away' operations. 'Make ready' and 'put away' operations can conveniently be performed by unskilled labour if not eliminated by a change of method. It is only the 'Do' operations that require any degree of skill and these should

be the domain of the skilled worker. But there are times when even some of these do not require any degree of skill. To really make the best possible use of unskilled labour economic batch production methods have to be operated. The expert has discussed these aspects with furniture manufacturers and procedures have been introduced to improve the effective use of unskilled labour in some furniture factories.

8.05 To reduce the material costs in furniture products

By reason of the fact that materials in the furniture product constitute the greatest percentage of the product cost; fifty percent in batch production, measures have to be introduced to reduce the material content to a minimum. In addition the costs of materials are increasing in the market dramatically due to international competition for these resources.

The percentage waste of solid timber can be as much as fifty percent and sometimes more; this makes it necessary to add to the material costs of a furniture product a hundred percent cost increment for solid timber. In view of these factors measures had to be introduced to reduce this wastage.

There seems a practice to build into the furniture product components of greater width and thickness than are structurally necessary thereby increasing the product material cost unnecessarily. This is particularly evident in the construction of upholstery frames.

Off cuts and pieces of timber not used are 'laid back' for possible use some other time but are never used as quite rightly no one had the time to search around among off cuts for the possibility of obtaining an appropriate sized piece.

With batch production of standard products, procedures can be introduced such as for example the cross cut sawyer cutting for a number of components at the same time and the organization of a simple reclaim section. The latter soon pays for itself. Technical design of the furniture product plays an important role in reducing the material content not only with timber and man-made boards but with other furniture materials.

This aspect of the product cost was adequately explained by the expert and measures that can be taken by manufacturers to reduce materials in their products.

The use of pine in the manufacture of furniture is a critical consideration as the amount of timber available from the forests does not meet the requirements of some furniture manufacturers, who produce pine wood furniture for export. Thus their exports are reduced by the non-availability of larger quantities of pine. Some furniture manufacturers however import additional pine timber or obtain it from a private source.

8.06 To reduce the cost of surface finishing

Due to lack of knowledge of the various techniques of wood surface finishing and the dearth of skill in this process area, manufacturers have taken the simple approach to this process and this has not always been the method that produces the appropriate surface required nor the one that contributes to the lowest labour time.

In consequence surface finishing consumes considerable labour time when expressed as a percentage of the product direct labour cost.

To meet this situation various things have been done by the expert. Technical articles and manuals have been prepared on all the individual processes and finishing schedules. Seminars on finishing, its relevant equipment, have been held in furniture factories outside production hours. The explanations on surface finishing schedules have been qualified by finishing costs for each schedule. The results achieved have compared favourably in quality at much less cost both in material and labour time than the previous methods.

9. Recommendations

There would appear to be a parallel between the present situation in the Cyprus furniture industry and the problems

of the British furniture industry immediately subsequent to the Second World War. The expert is qualified to express this opinion as when employed by the Furniture Development Council in Britain as production adviser to the British furniture Industry, he identified these problems and assisted in solving them. The collection of present problems have a remarkable similarity, but it is hoped that the Cyprus furniture industry will not commit the same mistakes that the British industry made to rectify the problems. Britain appeared to seek some universal remedy and found that those things that were thought would be the panacea for the industry's problems only created more problems.

There was the British governments control of the quality of manufactured furniture by the introduction of the 'Utility' Scheme. Whilst this had the effect of maintaining and raising the quality of furniture it subsequently had the effect of retarding the development of furniture design. It was subsequently discovered that a minimum quality standard would have sufficed, operated together with furniture performance tests. for protecting the customer from the shoddy furniture which manufacturers eager for quick returns would have made. However, the 'Utility' Furniture Specifications are still a good basis for the preparation of a quality standard for furniture.

Another solution thought to be the answer to the poor management in the British furniture factories was the introduction of professional managers into the industry. This was done by management training, but it was subsequently found that the answer lay in the encouragement of more technical methods improvement and not the introduction of management techniques. To meet this requirement the maximum number of personnel were sent on courses for 'Method Study' which made everyone in the industry conscious of the important use of method study and what it could achieve, and encourage personnel to think along particular lines in their everyday work. This

enabled problems to be approached in a methodical manner with direct reference to the furniture industry and not by taking a solution from the Engineering industry and expecting it to be successful in the Furniture industry. The furniture industry when compared to other industries is seen to have particular and unique features. The speed of processing is much faster so that any production control procedures that are introduced must be designed specifically for the factory it is to control, paper work must be kept to a minimum and participation therefore of personnel is more important than the details of the system.

Another additional management technique that was considered to be very beneficial in Britain at that time was a Furniture Product Costing System which was also used in the furniture factories as a control. This enabled manufacturers to control their factories more effectively and their products to become more competitive. Another introduction seen to be of considerable importance was the organization by the Furniture Development Council of a technical information service. As technical knowledge of an industry doubles every six years it was essential to keep the industry up to date for it to remain competitive. The injection of this technical information into the industry also encouraged furniture design activity to exploit the new machine tools, materials and processes.

The Furniture Development Council conducted seminars for furniture production and management personnel on current problems in the industry and their solution. This also helped to raise the technical standards in the industry.

An apprenticeship scheme was devised in conjunction with the City and Guilds of London Institute examination system and this was subsequently operated and certificates in all furniture subjects were made available. This enabled the recognition of the appropriate standards to be achieved and evidence of this achievement was demonstrated by the production of a certificate. A learnership committee was set up on which the Union and

Management were represented under an independent chairman. This body was responsible for issuing the certificate of completion after the apprenticeship had been satisfactorily completed.

Technical schools in the major towns were organized with proper instructors who had been trained in the particular furniture subjects. The necessary machines, equipment and materials for the training of the apprentices on a part-time basis had to be made available by these technical schools for this purpose. The expert was the Chief Examiner of many of the furniture subjects and was also an educational member of the learnership apprenticeship committee.

An exhibition was held once each year in February when trade was slack to show off the products of the industry in London and in various major towns.

After six years of method study application work measurement was introduced firstly only as a basis of production control. After this had been in operation for some time a straight proportional bonus scheme was introduced in some factories operating batch production with the full agreement of the Union and the employers association.

As a result of all the developments in the British furniture industry it soon became apparent to manufacturers that they would have to specialize for greater efficiency and for product and company identification. But because there were seasonal fluctuations a combination of specialist products were adopted by some manufacturers with successful results.

This brief pattern of developments of the British furniture industry would indicate the possible direction in which the Cyprus furniture industry should proceed to become more efficient and competitive.

9.01 Continue the information service for the industry

This should be continued as the availability of technical developments in the industry is one of the most important influences on the successful development of the industry in Cyprus. The best location for this information service is in the industrial extension service of the Ministry of Commerce and Industry where individuals are likely to be unbiased with regard to the selection of particular types of plant and equipment. Furniture manufacturers might be reluctant to seek information from their association for fear that this might prejudice their competitiveness with regard to other companies.

It is suggested that the industry should become an associate member of the Furniture Industry Research Association, Stevenage, England. By doing this all technical information would be made available to the Cyprus industry. This may prove a satisfactory arrangement as the duplication of such an organization in Cyprus could not be economically justified. But if the furniture industry research association is to be discontinued as a result of British Government policy it may reappear in another form. Procedures would however have to be introduced to see that information received remained in the files.

9.02 Abstracting of technical publications

Abstracts of furniture technical developments should be prepared in the Greek language for distribution to interested furniture companies to enable them to be aware of developments. Information contained in trade publications is relatively small when compared with research publications of FIRA (Furniture Industry Research Association) and TRADA (Timber Research and Development Association), and other organizations of a similar kind in both the U.S.A. and the United Kingdom.

There are, of course, other abstracting organizations which specialize in certain industries. However, the furniture industry is quite wide in its associated technologies, for this reason it is interested in developments in woodworking machines, plastic

technology, new man-made boards, surface finishing technology, timber technology and applications, to name only a few areas. Thus, they would be interested in the abstracts of P.E.R.A. the Production Engineering Research Association, the Institute of Plastics, both of the United Kingdom and the United States of America, the Forest Industries Research establishments of both Britain, America, and Canada. The passing on of information from French and Swedish abstracts would not be much of a problem, as the Cypriot is a good linguist and there is always someone with a sufficient knowledge of the language to review the abstracts to determine the ones that are most likely to be of interest to the Cypriot furniture industry and also translate these into Greek.

9.03 Continue training of furniture personnel

The City and Guilds of London Institute evening courses started by the expert should be continued as at present for those interested in improving their technical standard. The staff already trained in these courses should be used to conduct them.

The Furniture Apprenticeship Scheme should be reorganized along the lines of the British Scheme. The responsibility for continuing these City and Guilds Furniture Course should be with the Technical School Nicosia where adequate equipment and facilities are available and staff trained to run these courses. As at the present time this responsibility should be supported by the Ministry of Education who desire that these courses should be provided to enhance the training of technical personnel and apprentices for the wood industries. Examinations for the 555 City and Guilds apprentice certificates should be taken either in Greek or in English, as they are organized in Hong Kong.

It is suggested that there should be more emphasis on the technical course content than on general studies so that the apprentices see and feel that they are achieving technical benefit from such a scheme particularly at the beginning of such a course.

9.04 Continue Industrial Advisory Activity

The Ministry of Commerce and Industry should continue the advisory service for the furniture industry in order to assist furniture managers with the selection of machinery and equipment, factory layouts, material handling and the simplified product costing system.

9.05 Approach to furniture design

Fundamental furniture design should be encouraged by the various methods available. Lectures and seminars on furniture design success stories, the design brief, furniture product development and the holding of a yearly competition for a furniture design would create enthusiasm for this.

The basic objective of the fundamental design approach should be to exploit a process or a constructional technique: 'V' grooving construction, thin skin shaped panel production, 'KD' construction of the various demountable metal frame methods. Panel frame production such as a development of the British Utility furniture scheme which because of the developments in machines, materials and processes now has relevance and is not now so labour intensive, to suggest only a few.

The possibility exists of co-operation with a foreign furniture company to make furniture designs under licence. By this means 'know how' would be obtained together with designs of jigs and fixtures, and manufacturing schedules. This arrangement with British furniture companies works well in Malta and this country is exporting their products to North Africa, Arab Countries and France. Joint ventures should be arranged through the furniture section of the Association of Wood Industries or by direct contact between interested parties.

Greater attention should be given to designing to meet the requirements of export markets. Elements of any furniture design should include those features which contribute value in the eyes of the purchaser.

9.06 Organization of Quality Standards for Furniture

Simple quality standards for furniture should be drawn up to which the industry can work and which can be used as a guide to possible standards for the protection of the industry from cheap foreign imports of a substandard kind. This will discourage the Cyprus furniture industry from coming down to the poor quality of some imported furniture, to compete in price. It is not necessary to go to a 'Quality Label' similar to the 'Kite Mark' of the British Standards Institute, as this would make it necessary for performance testing and the introduction of equipment for doing this plus an organization for carrying this out. Except for certain features the general quality standard of Cypriot furniture products is quite good. However, necessary quality standards should be devised to protect the

Cypriot furniture industry from poor quality furniture which would not meet these standards and which are dumped on the Cyprus market from the European community.

Greater attention should be given to the quality of machining. If greater accuracy was achieved and the quality of the machined finish improved this would reduce the considerable labour time involved in fitting assembly.

Also greater attention should be given to surface finishing by adherence to recognized finishing schedules and materials which would reduce the cost of finishing and the labour time involved and would produce a surface finish superior to present results.

9.07 Introduction of labour cost control

Measures should be introduced to make better use of skilled and unskilled labour by the introduction of improved methods to reduce work content and raise productivity. Simple controls should be introduced designed for the particular factory which enable the skilled worker to do skilled tasks only, and unskilled workers to do 'make ready' and 'put away' activities. Reduce the fetching and carrying and the materials handling of skilled workers. The productivity of skilled labour as previously explained is only forty percent but it is reasonable to expect at least a seventy percent productivity on day rate working. This improvement may be obtained by the introduction of improved methods and simple labour cost controls. However by the introduction of these improved methods and controls the productivity is always in excess of sixty percent. The expert has obtained this in a number of furniture factories as a result of the introduction of improved methods. The effectiveness of supervision should be improved by instructing them in the simple procedures of labour cost control.

9.08 Continue application of Product Costing System

It is important that help be continued to be given to furniture companies in introducing the simplified product costing system

prepared by the expert at the commencement of the assignment in 1977. (See Annex II - Publications - Method of Establishing Furniture Product Costs).

This is important as a basis for the successful operation and control of the factory. Without this there is very little opportunity for the cost comparison of methods and the control of costs. This would simplify, among other things, the assessment of the value of work in progress necessary during the annual stock taking. This has proven difficult, without such a costing system, in the Cyprus Furniture Industry. Furthermore the simplified method enables the average furniture manufacturer to calculate all his cost accounting without having to rely too much on the services of a professional accountant except at the end of the financial year.

Guidance should also be continued to assist furniture managers in Analytical Estimating of labour times especially in wood machining. (See Annex II, -Publications).

9.09 Organization of Training of personnel in Method Study

Method Study courses specifically designed for the personnel of the furniture industry should be held with examples of application in the industry so that its relevance may be demonstrated.

It is suggested that the basis of these courses should be the publication written by the expert, 'Method Study and the Furniture Industry', by R.H. Glossop, Pergamon Press, Oxford, England. During these courses maximum use should be made of course work projects and the lecturing reduced to an absolute minimum.

It is essential that this approach and thinking should be encouraged as future development of the industry will depend very much on this.

9.10 More effective material utilization

By reason of the fact that materials are expensive and are likely to continue to be so close attention should be given to the problems of obtaining materials and their effective utilization, so that the furniture product cost may remain competitive. Remembering also that materials constitute fifty percent of the product cost in Economic batch production of furniture a saving in materials can contribute to a considerable reduction in the ex-factory price of the product.

This question may be approached from many angles but the basic necessity is for each furniture to have adequate cutting sheets, showing rough sizes and finished sizes of each component in the product. This together with close attention to the dimensions of component sizes will go some way to meet this objective. The structural design of both cabinet furniture and the various types of chair should be considered to obtain an economy in materials. The expert has already provided information which will go some way to assist in the reduction of the material content of each furniture product. The publications 'A Design Manual for Cabinet Furniture' - Basic Scientific principles concerning its construction, Pergamon Press, Oxford, England and 'Structural Principles of Chair Design Revealed by Performance Testing', F.I.R.A. (Furniture Industry Research Association). Research Journal Number 4, 1975.

The air seasoning and the kilning of timber still requires considerable attention if timber waste is to be reduced.

The adherence to correct surface finishing schedules will soon demonstrate a considerable saving in the cost of surface finishing materials.

UNITED NATIONS



ANNEX I

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

UNIDO

26 September 1980

PROJECT IN CYPRUS

JOB DESCRIPTION

INTERNAL

DP/CYP/80/006/11-01/31.7.A

Post title Expert in the Production of Furniture

Duration Six months

Date required As soon as possible

Duty station Nicosia, with travel within the island

Purpose of project To provide assistance for the technical development of the furniture industry on the island with a view to raising the standards of design and production and to provide expert advice on appropriate manufacturing techniques

Duties In co-operation with the Ministry of Commerce, the expert will give the furniture industry advice on all aspects of design, production and export marketing of furniture. More specifically, the expert will be expected to:

1. Provide for the dissemination of knowledge and technical expertise related to the production of furniture;
2. Introduce methods of establishing production costs;
3. Give advice on the re-organisation and expansion of existing industries and provide assistance to new industries with particular emphasis on factory layout, selection and introduction of new items of machinery, improvement and adaptation of working methods etc.
4. Streamline production methods and production planning and control;
5. Give advice on quality production of furniture and joinery products;

Applications and communications regarding this Job Description should be sent to:

Project Personnel Recruitment Section, Industrial Operations Division
UNIDO, VIENNA INTERNATIONAL CENTRE, P.O. Box 300, Vienna, Austria

6. Promote the idea of knocked-down modular furniture and give assistance to local industry with regard to their constructional design, production and packaging;
7. Arrange for the organisation of courses, seminars and demonstrations on specialised and specific topics of the Technology and Practice of furniture production in collaboration with other Government Departments such as the Ministry of Education and the Ministry of Labour and Social Insurance;
8. Train counterparts;
9. Advise the Government on which policy measures should be taken in order to achieve optimum development of the furniture industry, on an ad hoc basis.

The expert will also be expected to prepare a final report, setting out the findings of the mission and recommendations to the Government on further action which might be taken

QUALIFICATIONS

Wood Technician or Engineer with considerable experience in the production of furniture on an industrial basis; experience in teaching and designing courses in this field of specialisation an asset

LANGUAGE

English

BACKGROUND
INFORMATION

The present number of industrial units manufacturing furniture on the island is about 70, employing a total number of 2,000, the value of gross production in 1974 being C£ 3.6 million. The exports in 1974 were C£ 29,000 and the imports during the same year were C£ 700,000.

The local demand for furniture has fallen due to the economic situation in the country which subsequently resulted in a lowering of the standard of living. In this connection gross production fell from C£ 5.3 million in 1973 to C£ 3.6 million in 1974. However, it is felt that there is good scope for exporting furniture, particularly the knocked down modular variety, primarily due to cheap cost of labour and cheaper freight from the island to the Near and Middle East, North and East Africa and Europe. However, it is felt that to exploit the situation economically, better design and improved technique of production should be followed. An expert is therefore required for the purpose of up-grading the present skill and methodology of production to suit the demand of particular markets.

NO CANDIDATES REQUIRED AT THIS TIME

ANNEX II

PUBLICATIONS: (all by R.H. Glossop)

- A Sample Survey of Furniture Manufacturing Companies in Cyprus - Summary of Findings, Ministry of Commerce and Industry Publication, Nicosia, Cyprus, May 1977. (39 pages).
- Some Guidance on the Selection of Furniture Finishes, "Cyprus Industrial Journal", Volume 2, No. 9, September 1977. (pages 203-209).
- The Problems of Furniture Packaging, "Cyprus Industrial Journal", Volume 2, No. 6, June 1977. (pages 126-128).
- Analytical Estimating of Woodworking Machine Operations, "Cyprus Industrial Journal", Volume 12, No. 10, October 1977. (pages 218-222).
- The Analysis of Sanding Operations - Part I, "Cyprus Industrial Journal", Volume 3, No. 1, February 1978. (pages 2-8).
- The Analysis of Sanding Operations - Part II, "Cyprus Industrial Journal", Volume 3, No. 3, June 1978. (pages 38-45).
- Some Guidance on Mechanized Upholstery Methods, "Cyprus Industrial Journal", Volume 3, No. 3, June 1978. (pages 70-73).
- The Costing of Furniture Materials, "Cyprus Industrial Journal", Volume 3, No. 4. (pages 80-85).
- Activity Sampling and the Furniture Industry, "Quarterly Journal of the Ministry of Commerce and Industry, Cyprus", Volume 4, No. 4, 1979.
- Product Costs and Accounting For the Furniture Industry - A Method of Establishing Furniture Product Costs, Published by the Ministry of Commerce and Industry, Nicosia, Cyprus, 1977. (89 pages with 19 charts and forms).
- Wood Stains in Furniture Finishing, Ministry of Commerce and Industry Publication, Nicosia, Cyprus, April 1978. (20 pages).
- Wood Fillers in Furniture Finishing, Ministry of Commerce and Industry Publication, May 1978. (19 pages).
- Sealers in Furniture Finishing, Ministry of Commerce and Industry Publication, Nicosia, Cyprus, June 1978. (11 pages).
- KD Furniture Construction and its Advantages, Ministry of Commerce and Industry Publication, Nicosia, Cyprus, June 1980 (35 pages).
- A Production Study of the Manufacture of a 'Regency' Chair, Ministry of Commerce and Industry Publication, Cyprus, 1977. (40 pages).

Publications Cont.

A Production Study of the Manufacture of a 'Military Cabinet',
Ministry of Commerce and Industry Publication, Cyprus, 1977.
(49 pages).

Product Analysis in Furniture Production, "Quarterly Journal of the
Ministry of Commerce and Industry, Volume 5, No. 3. 1981.
(pages 15-20 and 25).

Wood Fillers in Furniture Surface Finishing, "Quarterly Journal of
the Ministry of Commerce and Industry, Volume 5. No. 4, 1981.

ANNEX III

Sample Cost Analysis of Furniture Products. November 7 1980

The following analysis of material and labour costs for each type of furniture product was made by consulting a number of furniture companies.

This information is a guide to manufacturing costs for some standard types of furniture. There is no possibility of accurately determining the retail selling price of each item from this information because a variable percentage profit is added according to the market value of the product. This is the result of the furniture manufacturer being his own retailer:

Item	Materials (C£)	Labour (C£)	Approximate Retail Price (C£)
<u>1. Bedroom</u>			
- Single Bed	14	7	41
- Double Bed	28	14	82
- Dressing table	17	8.500	
- Wardrobe	20	10	50
- Bed side table and cupboard	2	1	25 - 32
- Chest of drawers	10	5	
<u>2. Sitting Room</u>			
- Fully upholstered 3- piece suite	160	80	555 +
- Long coffee table	4	2	
- Side table	3	1.500	
- Fire side chair	20	10	50
<u>3. Library with Office</u>			
- Library book case	4	2	
- Desk	8	4	
- Desk Chair	8	4	
- Chair	5	2.500	
<u>4. Dining Room</u>			
- Regency table	30	15	
- Regency chair	5	2.500	
- Side board	35	17.500	120
- Side serving table	10	5	

Annex III Cont.

Item	Materials (C£)	Labour (C£)	Approximate Retail (C£) Price
<hr/>			
5. <u>Kitchen</u>			
- Kitchen modular unit per metre run (melamine faced)	14	7	
Note: Five such units make up average kitchen equipment			
- Table	9	4.500	
- Chair	4	2	
<hr/>			

Material Costs: On average, represent 48.4 per cent of selling price
(Ex-factory) not retail price.

Labour Costs: On average, represent 26.9 per cent of selling price
(Ex-factory) not retail price.

Overhead: These will vary according to factory and standard of
effectiveness of product costing system.

Profit Margin: The retail selling price will vary according to the
market value of the product. Some items will have a
higher profit margin which will off-set the low profit
margin on another furniture product.

ANNEX IV

Government Officials and Furniture Manufacturers with whom the
Expert has Worked with and Consulted During his Assignment:

Mr. M. Erodocritos, Director General of the Ministry of Commerce and Industry. From whom direction was given.

Mr. J. Papadopoulos, Senior Industrial Officer, Ministry of Commerce and Industry. Immediate industrial councillor.

Mr. Hajinicolos, Director of Technical Education, Ministry of Education, Nicosia.

Mr. Fasiloutis, Furniture Manufacturer and present Chairman of the Association of Wood Industries, Nicosia.

Mr. Pambos A. Savvides, Managing Director of A.L. Savvides Ltd., Furniture Manufacturer. Trained furniture designer at the Royal College, London and manufacturer of reproduction furniture of high quality.

Mr. Spiros Zavros, Industrial Officer, Ministry of Commerce and Industry, Nicosia, Second industrial counterpart.

Mr. Andreas Georgiades, Instructor in woodworking and furniture. Second educational counterpart. Technical School, Nicosia.

Mr. Perrides, Formerly Minister of Commerce and Industry now President of the Employers Association, Nicosia.

Mr. Andreas Tricomitis, Managing Director of Enoxyl Ltd., Furniture manufacturer, Limassol.



