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TRANSFER OF TECHNOLOGY FOR FURNITURE MANUFACTURE 1/

by

Aldo Vuga 2/

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1. INTRODUCTION

Yugoslavia, although a developing country, could be placed among the most
developed countries among the group of 77. In accordance with our foreign
policy, it is trying to play an active role in creating a new international
economic order.

The basis for such an activity are main conclusions of the conference of
the non-aligned movement held in Colombo in 1976. The aims of Yugoslav
foreign policy are therefore directed towards intensifying cooperation between
developing countries especially in the field of Economic Cooperation among
Developing Countries (ECDC). As a result of this, the value of trade among
developing countries has greatly increased.

Yugoslavia has considerably improved its traditionally good political and
trade relations with these countries. The total turnover in 1978 reached a
value of US$ 2.5 billion, export increasing to US$ 1.1 billion and imports to
US$ 1.4 billion.

Yugoslavia has based its economic policy on experience acquired through
its own development. In the period after the Second World War there were
enormous differences in economic development among its republics and
provinces. It believes that development can be achieved through intensive aid
to the less developed partners in the field of technology in order to improve
their own economic basis and to enable them to make similar progress in the
exchange of goods and services.

We should keep in mind that profit is not a basic principle of Yugoslav
economy and therefore it also plays a subordinate role in the transfer of
capital and technology to the other developing countries.

Creating the new international economic order is one of the main goals of
Yugoslav foreign policy. But due to its lack of capital and the relatively
low level of its own technology in foreign trade (compared with the developed
countries), Yugoslavia has mainly practiced pure trade transactions, i.e.
classical exchange of goods.
However, classical trade should not be underestimated because it represents a starting point for further close cooperation. It offers a possibility for a better understanding of other countries, of their economies, their culture, etc. The share of Yugoslav exports to the developing countries increased from 14.7 percent in 1964 to 18.5 percent in 1979.

In case two countries are interested in closer cooperation to their mutual benefit, the best way to achieve it is by preparing the ground for joint ventures on a large scale. Naturally more developed partners should offer know-how which is easily transferred.

Owing to our social order, our aim in foreign trade is not primarily gain-seeking; on the contrary, it is general development, coordination between export and import and by no means dominating the partners. Therefore, in many cases, Yugoslavia can be an ideal partner. The following chapter will show an example of the business strategy of a Yugoslav company which may be illustrative for developing countries. We have already started transferring our technology, which is based on our knowledge and research. It can be an example of the general principles of the Yugoslav economic cooperation with developing countries.

2. THE WOOD PROCESSING INDUSTRY IN YUGOSLAVIA

One third of Yugoslavia's area is covered by forests which are one of its greatest natural resources. The importance of the forests is illustrated by the fact that the wood processing industry of Yugoslavia employs about 180,000 people, or 9 percent of all employed in manufacturing and mining. Its share in the national revenue is 7 percent and it represents 9 percent of its exports, while the imports of this sector are ten times lower. Owing to its vast natural resources, the wood processing industry has a long tradition. For example, in the year 1930 (first phase of industrialization process in Yugoslavia) it was the most important branch in the industrial sector from the point of view of employment and investment.

1/ Including primary processing (sawnwood and wood based panels), secondary processing (furniture, joinery and manufacture of small articles). The importance of wood processing industry is still greater if production of pulp and paper is included.
Logically, initially it was the sawing industry and other lower level wood processing industries that prevailed. Later on the structure quickly changed in favour of more sophisticated products. After the Second World War the development was especially rapid (see table 1 hereunder):

Table 1: Structure of wood processing industries in Yugoslavia

<table>
<thead>
<tr>
<th>Group</th>
<th>1939</th>
<th>1960</th>
<th>1974</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sawnwood</td>
<td>73.3</td>
<td>31.7</td>
<td>15.4</td>
</tr>
<tr>
<td>Boards and veneers</td>
<td>3.8</td>
<td>14.5</td>
<td>11.9</td>
</tr>
<tr>
<td>Furniture</td>
<td>6.6</td>
<td>25.2</td>
<td>48.9</td>
</tr>
<tr>
<td>Other</td>
<td>6.0</td>
<td>23.9</td>
<td>22.5</td>
</tr>
<tr>
<td>Chemical products (matches, charcoal, etc.)</td>
<td>10.3</td>
<td>4.7</td>
<td>1.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

The exports of the wood processing industry's products have followed the same trend as its development and structural changes. Before 1940, the exports of the wood processing industry was dominated by sawnwood. In 1960, its export share fell to 55 percent and further to 45 percent in 1974. At the same time, export share of furniture increased from 15 percent in 1960 to 31 percent in 1974. Since exporting is of a vital importance for any economy, the wood processing industry, in spite of its relatively small share in total national revenue (less than 10 percent), acquired a greater importance than its share would justify owing to its higher degree of export/import ratio than other export-oriented industries, as indicated in table 2 below:

Table 2: Percentage of total foreign currency earned from Yugoslav exports
exports of goods by branches in 1980

| a) Wood working industry    | 30.25 |
| b) Leather industry         | 19.82 |
| c) Shipbuilding             | 13.80 |
| d) Textile industry         | 11.26 |
| e) Non ferrous metals       | 10.57 |
| f) Other branches           | 15.30 |
| **Total**                   | 100.00% |
Naturally, the structure of exports are also important. It is interesting that the furniture industry reaches a phase of its maturity relatively late and the surprising fact is that in the case of exports of the Federal Republic of Germany, it represented the greatest share among all the branches in that country's exports to the world in 1977, namely 24 percent or almost one fourth of the world exports, while its share of machinery exports was 23 percent, passenger and transport vehicles 21 percent and the metal industry 19 percent.

The 24 percent of exports of 1977 were valued at £749,330,000 at CIF prices. Obviously, the woodworking industry, and especially the furniture industry, is extremely important not only for developing countries, but also for highly developed industrialized countries. The fact is not that much important for the branch of industry itself, but because of its influence on other spheres. The development of the furniture industry is conditioning the development of the corresponding technology and is related to the machine industry.

In 1977, the Federal Republic of Germany was the world's greatest manufacturer of woodworking machinery with a production of 104,402 tons, ahead of Italy which produced 99,944 tons, while Yugoslavia manufactured only 3,529 tons of woodworking machinery.

Export technology can achieve development in the following sequences: development of the industry for the domestic market, export to neighbouring countries, export to overseas countries, development of suitable machine industry, export of technology.

As we shall see later by studying the case of the Meblo Company, and its association (UNILES), the Yugoslav wood processing industry has gone through the same stages of development.

3. **DEVELOPMENT OF MEBLO**

The development of MEBLO in Nova Gorica has its origin in the old craft traditions of the joiners from the town of Solkan who were united in their own association before the First World War and soon after it. Through this association, they exported their furniture (for example to Egypt). After the Second World War, more joiners' associations were established in Solkan and in the neighbourhood. In 1948, the joiners from Solkan united and started the production of furniture in the existing sawmill and in their own workshops. At the same time, they started to build wooden premises for the new factory (in the central location of Meblo of today). Immediately after moving to the new premises, in 1950, they succeeded, because of the high quality of their products, in placing them on the British market, thanks to being a result of their long tradition as craftsmen.

During the first decade of its existence, the factory worked intensely on its mechanization and industrialization. The furniture was exported mainly to the Western European markets. Due to shortage of raw materials, Meblo produced sawnwood, wood based panels, veneers and classical mattresses for beds to comply with the needs of its own production facilities. The number of employed persons gradually increased to about 500 workers.

In the next period, new products were introduced such as innersprung mattresses (it was the first factory to produce them in Yugoslavia) and upholstered furniture (armchairs, couches, seating sets). The factory cooperated with a number of smaller factories in the neighbourhood of Nova Gorica. Besides that, many organizational and business innovations were introduced, such as its own development and design of products, its own export department. It started opening its own showrooms. It introduced modern methods of bookkeeping and of cost calculations (it was the first in Yugoslavia to use the direct cost method and value analysis).

After 1970, the former cooperating companies integrated with Meblo and new products were introduced such as light fittings and high quality plastic
materials as well as industrial synthetic wadding. They were all based on a
joint venture with foreign partners. Plastic furniture was the result of
Meblo's own research, and later the integrated Meblo started producing
different types of signalization specially traffic signals. The largest
particle board factory in Yugoslavia was built. Three subsidiaries for export
promotion in Italy, Austria and West Germany were established.

Since 1980, the efforts have been made not only to achieve a physical
expansion of production capacities, but to attain higher productivity, a
better quality and break-through in the export markets. The result of these
development efforts has become very important and they will lead to the
production of machinery for the wood processing industry (up to now this
production has been more or less symbolic, and was mainly complying with its
own needs) and the establishment of its own business units in the third world
countries. Meblo has established its agencies in the United Arab Emirates and
in Iraq, it will place stock on consignment in Kuwait, a new joint venture
factory is being built in Nigeria, together with a Nigerian partner. Further
Meblo's experts were successful in transfer of technology to Lebanon, Kuwait
and also the production in Italy is based on its own technology.

Training of personnel has always been considered very important. This has
also enabled such a development of Meblo. Contemporarily with the creation of
the factory, a school for professional training of joiners - and later on
technicians - was established. The workers trained were later able to direct
the production from the craft to the industrial level. These facts made Meblo
one of the most esteemed furniture manufacturers in Yugoslavia.

The basic data for Meblo in 1982 are as follows:

<table>
<thead>
<tr>
<th>Turnover 1981:</th>
<th>Din 4,165,678,000 (US$ 83,000,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manpower:</td>
<td>3,100</td>
</tr>
</tbody>
</table>
Annual production:

- 16,000 m³ sawnwood
- 120,000 m³ particle board
- 17,000 sets of bedrooms
- 235,000 pieces of furniture of different styles
- 75,000 pieces of upholstered furniture
- 270,000 spring mattresses
- 432 tons light fittings
- 500 tons plastic furniture
- 400 tons traffic signalization equipment
- 1,500 tons industrial wadding

Structure of production (in percentage by value):

- 55 wooden furniture of different styles
- 10 spring mattresses
- 10 upholstered furniture
- 20 particle board and sawnwood
- 5 light fittings, signalization equipment, plastic furniture, wadding.

Sales channels (1981) by value:

- Home market 79 percent
- Export 21 percent

Physical export accounts for 30 percent of the total production and is directed to about 40 countries of Europe, Africa, Asia and the United States of America.

Production:
- 14 divisions specialized in various types of furniture or in a matching product;
- Total surface of all covered production premises is 95,000 m²
- Production units employ from 50 to 450 workers.
Sales are performed by:
- BOAL (Basic organization of associated labour) "Trzenje" deals with wholesale trade on domestic market, exports, contract furnishing, warehousing and dispatch, market research and advertising;
- BOAL "Trgovine"(Sale) deals with retail trade in Yugoslavia through its own seventeen showrooms.

4. EXAMPLE OF TRANSFER OF TECHNOLOGY THROUGH JOINT-VENTURE IN NIGERIA

In 1980, when the medium-term development plan was being prepared in Meblo, a specific method of strategic planning was used. During discussions on the export markets, certain countries were left out due to their specific restricting import conditions, such as a ban on imports, high customs duties, high transport costs, etc., and a specific approach or adaption of the cooperation policy with them has been proposed. Nigeria, the largest African country, in which imports of furniture are becoming more and more restricted, was among such countries. Meblo, an extremely active and practically the only permanent Yugoslav exporter of furniture to the countries of West Africa such as Benin, Ivory Coast, Liberia and Gabon, succeeded twice in exporting its products to Nigeria for furnishing an hotel and an exhibition head office building in Lagos.

Due to its long-term strategy, Meblo was immediately willing to accept the initiative made by a Nigerian partner in the middle of 1980 for a joint-venture i.e. building of a furniture factory in Nigeria. After the preliminary talks were held and a draft offer for the production programme, way of cooperation and approximate investment level was made, the Meblo representatives visited Nigeria by the end of 1980. They got better acquainted with the market and with legal possibilities for a joint-venture and a potential location for the factory was chosen in the Cross River State. By the middle of 1981, a feasibility study was made and a contract was signed. The feasibility study was, to all intents and purposes made by Meblo, the partner only supplied some data on investments in the infrastructure and on the factory premises needed.

Here is a short summary of the feasibility study:
The Federal Republic of Nigeria is the largest African country with over 100 million inhabitants counting a great number of big cities. The gross national product was estimated at US$ 43 billion in 1978/79 and is growing at the rate of 9 percent per annum. The country's balance of payments is relatively satisfactory mostly due to great exports of oil, Nigeria is the world's fifth biggest oil exporter. It is intensifying its industrialization by promoting the establishment of basic industries such as the petrochemical industry as well as secondary industries (textiles, wood processing, foodstuff). The railroad and road networks, airports and port structures are well developed. The most important economic partners of Nigeria are: Great Britain, the Federal Republic of Germany, the United States of America and Japan.

In 1980, Yugoslavia exported to Nigeria goods valued at US$ 106 million and imported goods valued at US$ 187 million. Several Nigerian/Yugoslav joint-venture firms are being created.

Statistical data on the import and export of furniture in Nigeria were not available. Since 1978, the import of furniture has been banned. Statistical data on the furniture industry were not available either. But there are some factories like the wood processing complex in Calabar, a Nigerian Romanian joint-venture or some other smaller factories, none reaching a medium-size factory by Yugoslavian standard. There are two large mattress manufacturers producing only block foam mattresses and a factory producing light fittings for interior furnishing of flats.

However, different types of furniture are produced in individual cabinet makers workshops. Generally speaking, the supply of furniture on the Nigerian market is inferior in quality and high in price. The prospects of the factory are quite good since the Fifth National Development Plan gives a priority to house building. Besides, there will be great possibilities for furnishing of public projects such as hospitals, schools, hotels, government buildings, especially in the new capital Abuja which is under construction.

According to the import regulations presently in force, the import of furniture is banned, but it is permitted to import raw materials and some semi-finished products which are not available in Nigeria. The
customs duty rates are quite high, but reduced rates can be obtained for joint-venture projects which have a priority status and thus imports under the "approved user scheme" can be effected. Distribution of furniture in Nigeria is performed from the production directly to the customers. Factories have their own showrooms in bigger towns. Specialized independent furniture shops are rare. The production capacity of the factory for the First and Second Development Phases was made on the basis of the market analysis and of the actual competition (an estimation of corresponding technology had been made) as well as an estimation of matching technology.

The sales forecast and the proposal of the production programme are:

1) upholstered furniture 2000 sets
2) sprung base beds 2000 pieces
3) inner-spring mattresses 5000 pieces
4) light fittings 1500 pieces
5) wooden furniture (different units) 1100 sets or pieces

In the second phase, production of wooden furniture would be enlarged by another 4500 sets or pieces.

Four phases of construction and development are foreseen in the feasibility study:

First phase:
- manufacture of upholstered furniture, Jogi beds, and a small quantity of fitted furniture;
- sale and assembly of other Meblo products (mattresses, light fittings, plastic furniture).

Second phase:
- manufacture of fitted furniture for furnishing of houses and offices.

1/ Commercial brand of double spring beds
Third phase:
- manufacture of solid wood products (chairs, tables, wooden products for building).

Fourth phase:
- establishment of a timber processing industry: sawmill, production of veneer, coir fibre processing.

The production programme, the necessary machinery, areas, energy and water and manpower requirements are exactly determined in the technical study.

In the first phase 102 workers will be employed, 7 from Meblo. The experts of Meblo will take care of the production and training of the local personnel while all the other functions will be carried out by Nigerians.

In the second phase the total additional manpower adds up to 81 workers (3 being from Meblo). Further labour requirements will be about 70 workers in the third phase and about 100 in the fourth phase.

Training of the Nigerian personnel will be carried out on the site and seven of the most capable persons from among them will be sent on a two to three-months training course in Meblo.

By signing the contract the Nigerian partner engaged himself that he shall build all the necessary premises exactly as determined, while Meblo engaged itself to provide complete equipment which is specified in detail in the study, as well as technology in the form of plans, instructions, specifications, templates, regulations, graphs, etc.

The feasibility study shows that the project will be profitable and thus interesting for both partners: for the Nigerian partner investing 60 percent of the capital and the Yugoslav party investing 40 percent of the capital.
During the implementation of the project many difficulties occurred due to lack of experience of both partners. Many difficulties have arisen in acquiring all the necessary permits from the Nigerian authorities. The terms agreed upon are not fully taken into account as far as the construction of the factory is concerned. However, the delays are not long if we take into consideration that the project is a complex one comprising several versatile technologies and that the location of the factory is in a completely underdeveloped part of Nigeria. At the moment, the construction works are being completed, the machinery and all technical documentation in English are ready and a group of personnel has been trained. Three persons have been training in Meblo for several months to enable a pilot production of the factory at the beginning of 1983, one year after the date foreseen in the original time schedule.

The stages in the transfer of technology were as follows:

1) Meblo provided a feasibility study consisting of:
   - an exact production programme;
   - a list of the materials required, their prices, origin and an estimate of the quantities needed;
   - the technological process for each product and time necessary for its production;
   - a specification of the machinery required, its origin and price;
   - specifications and ground plans of the premises, plant surfaces, warehouses and offices;
   - a list and number of workers, their jobs, qualifications and labour costs;
   - an evaluation of power supply, water and compressed air needs.

2) During the first visit to Nigeria a manager, a marketing specialist and a technical expert studied the prospects on site. The latter supervised the complete technology, i.e. to take over the operational management of the project. Later on the number of persons working on the project increased to seven. These people assumed the responsibility of purchasing the machinery and equipment, preparation of complete detailed technical and technological documentation, calculations, plans, models, instructions, etc. in
English. Besides, that this staff attended courses in English and went through some additional technical training in Meblo in order to master all the technological, machinery, tools, maintenance and preparation of documentation in greater depth and for a wider range of products. They will be able to transfer their knowledge and experience to the Nigerian staff both in Meblo and in Nigeria.

3) All data dealing with technology has been recorded in reports or in plans and transferred, while the remaining know-how, i.e. primarily the experiences Meblo has acquired in about 35 years, will be transferred personally by the above-mentioned experts directly to the Nigerians. As far as know-how is concerned, an addendum to the main contract was signed. It is a draft agreement on the costs of transfer of technology (preparation of documentation, copying, travel, costs, etc.) which is to be signed later.

4) The technology and equipment are adapted to the Nigerian needs. The machines are mainly classical, almost all are of Yugoslav origin. They are not connected into lines, which enables a greater flexibility and quicker changes in the production programmes. Furthermore they are easy to operate, to manage and to maintain.

According to the demand of the Nigerian market, production of furniture of a higher quality has been planned. Meblo is an acknowledged manufacturer of the highest quality furniture in Yugoslavia thus about two thirds of the materials of a higher quality are to be imported from Yugoslavia while the rest will be purchased in Nigeria.

5) The contract provides also advanced technology, i.e. new technological achievements to be transferred by Meblo if needed.

6) The construction plans have been made by the Nigerian partner with Meblo's help and it is carrying out all the construction works under supervision of a Meblo expert.
7) Two to three-months training in Meblo are foreseen for the Nigerian workers while the main training is to be carried out in the factory in Nigeria. Several kinds of theoretical training of personnel in Nigeria is carried out by a technical school and by Meblo experts who are to be supplied. If needed, longer training at the specialized school for joiners and wood technicians in Nova Gorica can be organized.

5. FURTHER PLANS FOR TRANSFER OF TECHNOLOGY

Meblo is working on some other projects dealing with transfer of technology either by itself or together with other enterprises. We are working on a possible joint-venture in Egypt and a technology for mattress production has been offered to Algeria.

In order to improve our ability in the transfer of technology in future, we need to train more staff to acquire an additional knowledge of technology and of foreign languages. At present 15 candidates are being trained by our experts.

Meblo disposes of the following technologies which it is willing to transfer to interested parties: fitted furniture, upholstery, spring mattresses, sawnwood and plastic furniture. The draft offers are made on the basis of optional quantities of individual products and they supply the basic information on further requirements and questions.

The Center in Nova Gorica where skilled joiners and wood technicians are trained is planning to organize a permanent training of a kind of a permanent training course for candidates from developing countries. Meblo is going to assist them by enabling the candidates to get acquainted with the technology or industrial production of different types of wood processing and other industries.