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ASSISTANCE TO THE KNITTING INDUSTRY ,

SI/HUN/75/814.

HUNGARY .

Technical report: Product development in the
knitting industry

Prepared for the Government of Hungary
by the United Nations Industrial Development Organization,
executing agency for the United Nations Development Programme

Based on the work of K. P. Moltu, textile technologist

United Nations Industrial Development Organization
Vienna

id.77-4777

Explanatory notes

All references to dollars (\$) are to United States dollars.

The monetary unit in Hungary is the forint (Ft). During the period covered by this report, the value of the forint in relation to the United States dollar was \$US 1 = Ft 20.52 (currency) and \$US 1 = Ft 40.40 (trade).

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ABSTRACT

The increasing importance of the knitting industry in Hungary and the rapid expansion in production and installation of modern machinery and equipment led the Government to request assistance from the United Nations Development Programme (UNDP). This request was approved and on 1 March 1977 a textile technologist (annex I) was sent to Hungary for three months on the project "Assistance in the Knitting Industry" (SI/HUN/75/814)^{1/}. His mission was later extended for one month until 23 June 1977. The United Nations Industrial Development Organization (UNIDO) was the executing agency.

The aims of the mission were to ensure optimum utilization of installed capacity, to help out with organizational matters and to give advice on further technological development. No international assistance had previously been given to Hungary in this particular field.

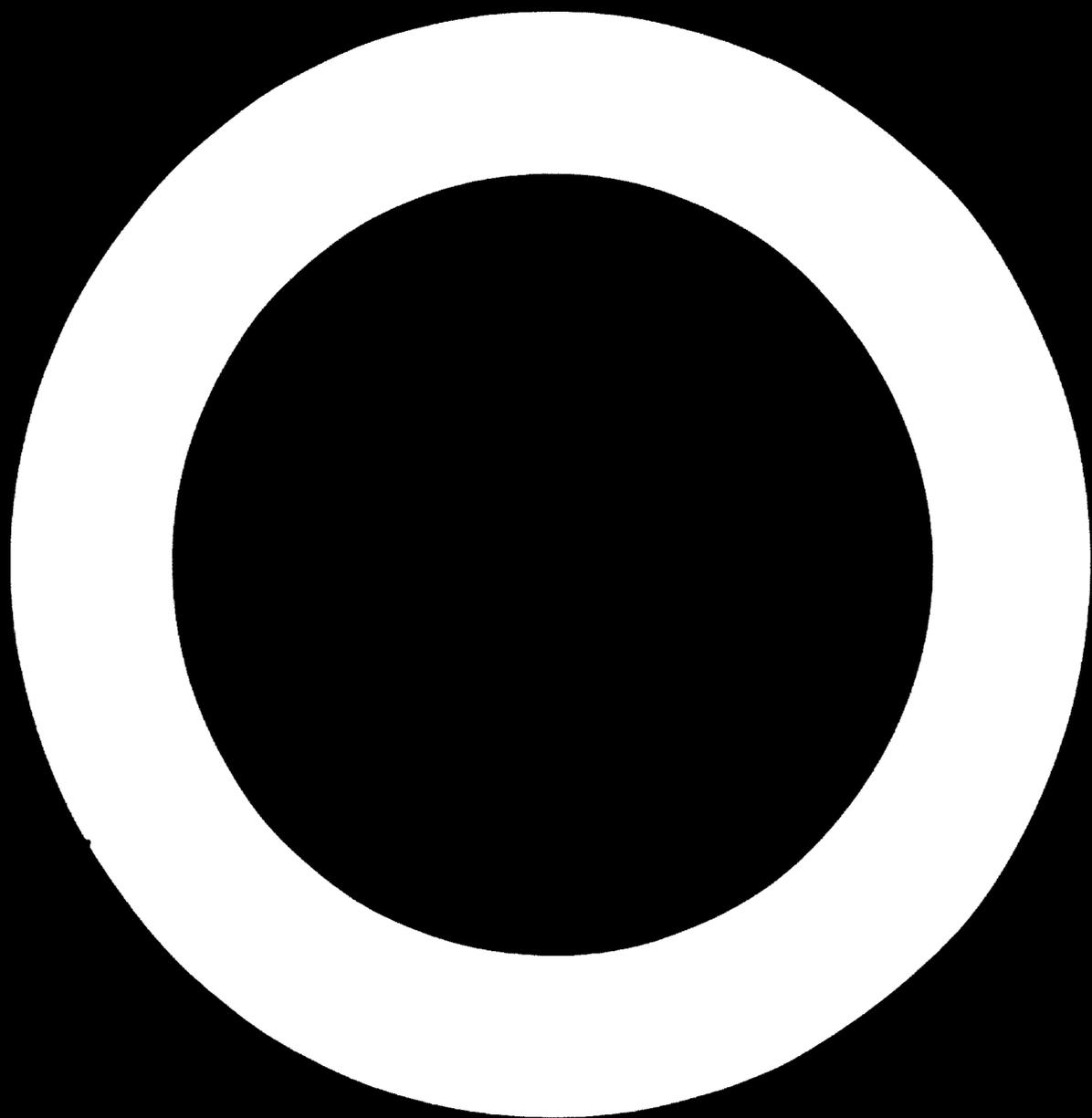
Product development is a part of the work of all the knitting mills but no organized procedure to anticipate future demands for products for the export or domestic markets has been seriously attempted. Not only the individual mills, but also the Ministry of Light Industry and various sales organizations believe this situation should be changed.

It was intended that work should be concentrated at Habselyem Kötöttárugár in Budapest, but that would not have been of general benefit to the industry as it is basically a warp knitting mill. It was therefore decided that a survey of the main knitting enterprises be made. As a result, two factories were chosen: Habselyem Kötöttárugár, and Váci Kötöttárugár.

The main recommendations were:

1. Co-operation should be encouraged between the mills, the various sales organizations and the Fashion and Textile Institutes.
2. Product development departments should come under marketing and sales departments, with close contact with production but not answerable to the latter.
3. Machinery should be made available to development departments.
4. Development staff should be given opportunities to contact customers and to attend international fairs.
5. More effort should be made to develop products within the knitting industry rather than venture into other fields.

^{1/} On 1 January 1977, the project number was changed from IS/HUN/75/014 to SI/HUN/75/814.



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INTRODUCTION

The increasing importance of the knitting industry in Hungary and the rapid expansion in production and installation of modern machinery and equipment led the Government to request assistance from the United Nations Development Programme (UNDP). This request was approved and on 1 March 1977 a textile technologist (annex I) was sent to Hungary for three months on the project "Assistance in the Knitting Industry" (SI/HUN/75/814)^{1/}. His mission was later extended for one month until 23 June 1977. The United Nations Industrial Development Organization (UNIDO) was the executing agency.

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Conclusions and recommendations are contained in the body of the report.

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I. FINDINGS

The rapid expansion of the knitting mills by the amalgamation of smaller units has, to some extent, resulted in organizational abnormalities. A major problem is that in most factories development staff comes under the production unit and has no real contact with either the marketing or sales departments. As a result, year after year, fabrics are made on a hit or miss basis. Some factories develop more than 2,000 articles per annum of which only about 200 have any sales potential.

The mills have had a sellers market for a long time but it is changing and sales are becoming gradually more difficult. As a result, panic measures seem to have been taken and mills are venturing into areas of production where competition is less fierce. Consequently, they are spreading their resources and adopting technologies alien to them. This may prove a safe way out on a short-term basis but will inevitably result in infringement of production areas of mills within their group.

Hungarotex and the other sales organizations are doing a good job of selling products. However, the ability to convey technical information and ideas to the development staff in the mills appears to be lacking. The sales organization cannot be expected to be fully conversant with the different production units and their capabilities, or to have specialized knowledge in the knitting field. It does not have the necessary knowledge of either the different types of mill equipment or their capabilities of meeting production requirements. Sales contacts are left to the managing directors of the knitting mills who, in most cases, delegate this responsibility to their fashion staff.

These fashion specialists, although qualified, seldom have technical or economic knowledge of the mill's equipment, machinery and capacities. They have the opportunity to visit customers both at home and abroad, but do not have the ability to channel required technical information back to their mills. The technical staff, on the other hand, have few opportunities to travel abroad to compare their own production with that of their international competitors.

A. The Fashion Institute

The Fashion Institute is a fairly large fashion institute and employs a large number of people. The Institute has several functions, for example, working with the shoe industry, and has the right international fashion contacts,

but technically it is not able to give the textile industry the aid and information required. A reorganization of the Institute to serve the textile industry more efficiently should be given priority. The reorganization of customer relationships to give the technical staff opportunities to study their counterparts' efforts in development should not tax finances to any considerable extent.

The Fashion Institute should be in a position to give assistance but does not have staff qualified to give technical and marketing advice. It is mainly concerned with making fashion forecasts and generally is not made use of by the mills. The fact that it is an outside organization, gives its services free and has no direct influence on the industry does not inspire greater co-operation.

Although the Fashion Institute is not part of the knitting industry, its functions should benefit the industry to a far greater extent than at present. This would require a thorough and separate study apart from this project. However, there are areas where the Fashion Institute can be put to better use without any great effort or major reorganization. It is recommended that specialists in knitting, finishing and making-up be attached to the staff of the Institute. In addition to their technical qualifications, they should have a sound practical background and be given the opportunity, through constant contact with the industry, to furnish new ideas and give technical assistance. Their functions would be of value, in particular, to the outlying mills that lack technical staff and whose products do not meet quality standards.

They could also help to locate machinery not being used to its full capacity, particularly in finishing, such as padding mangles for siliconing. For example, Hungaroprint made mercerizing trials on equipment previously used only for woven fabrics.

It might be advisable to pay such staff from a levy on the industry they serve. This will ensure that they are being used to their full capacity and are part of the industry and consequently will not become another department within an institute that is not appreciated by the industry.

Specialists should have their wages increased so that the best type of personnel are encouraged to apply for posts at the Fashion Institute.

These specialists should be given authority so that their functions will not be hampered by bureaucracy. However, their functions must be to give assistance and ideas, not to impose directives on the various knitting mills they are intended to serve.

Their services should not impose an appreciable economic burden on industry. The Fashion Institute employs sufficient staff to take care of any secretarial work without further recruitment of staff.

B. The Textile Research Institute

A similar situation can be seen in the attitude towards the Textile Institute. This very competent establishment appears to be carrying out its own development and research work without much contact with the industry. However, it does employ a competent staff and possesses knitting machines. It could easily take some pressure off the various development units if it were made use of on a broader basis. However this Institute does not seem to be made use of to any reasonable extent; the reasons given are that it charges too much, takes too long and is too bureaucratic in its attitude towards outside work. Internally, however, it seems efficient, and the approach to projects is sound. Each mill tries to avoid external assistance and to be self-sufficient.

Similar difficulties exist in getting specialized help from outside firms that may possess machinery that could be utilized but is running at under-capacity. This is particularly evident in transfer printing and possibly in finishing, for example, the mercerizing of knitted goods. In this latter field the process is in its infancy, but offers great possibilities. The trend however is to try to obtain speciality machines at high cost without first exploiting the machinery available.

C. Habselyem Kötöttárugvár, Budapest

The present organization at the Habselyem knitting mill does not allow for successful methods of work in fabric development. The main difficulty is that the development department is entirely dependent upon the production departments. Apart from lack of authority by the development manager, the production units have to meet their targets and development work is bound to suffer. The development manager should therefore rank at the same

authoritative level as the managers of the production, finishing, sales and marketing departments. However, upgrading the development manager's position will not solve the major problems related to production as targets will still have to be met.

The only solution to this, that will also prevent inter-departmental friction, is to give the development manager sole control over a separate fabric unit for development (annexes II and III) and make him responsible to the technical director, who in turn is responsible to the managing director. This will bring the development manager into line with the production manager and hence rank-pulling in priorities related to both staffing and equipment will be eliminated.

Production for the domestic market

There is no great problem with customer contact at present. The development department has contacts with the domestic market. With contacts related to exports to the Union of Soviet Socialist Republics there are also reasonably good contacts with the buyers as they visit the various factories during the process of purchasing their products and here the technical development manager should be present together with the sales staff so that he is fully in the picture in relation to the customers impressions and comments on Habselyem's products.

When it comes to export markets outside the area of the Council for Mutual Economic Assistance (CMEA) the problem is greater. However it is essential that the product development staff be given the opportunity to attend the more important trade fairs outside Hungary.

It is recommended that the development manager be given the opportunity to attend the main trade fair, INTERSTOFF, at both its biannual exhibitions.

Other members of his staff should also be given opportunities to attend one or more of the important trade fairs in their specific fields.

These arrangements must be worked out in close co-operation with the Hungarotex sales organization. When buyers from abroad visit Hungarotex with the intention of placing orders, the various factories whose products are being discussed, the development manager and the fashion expert should be informed and invited to the sales discussions. Information and ideas for product development work can be obtained in this manner without extra cost and effort.

Recommendations

Trials with spun yarns in warp knitting are being carried out. Fluff and foreign matter deposits on the yarn guide-reed cause breaks of about one fault per metre. A remedy for this would be to reconstruct the reed to give an up-and-down movement that would shed these impurities.

Slack mercerizing of 100% cotton fabrics should be undertaken to give a better dye absorption, better stability and to create a new profitable product.

D. Váci Kötöttárugyár

The buildings at Váci knitting mill are not suitable for their purpose, for instance there are no proper yarn storage facilities which greatly affects product quality. The premises cannot lead to good house keeping and efficient production.

Organizational changes (annex IV) are not needed for this mill. The mill, which is concerned solely with the production of weft knitted fabrics, ideally should have set aside machinery in a separate development unit but top management has not found this economically defensible. Consequently, development work is carried out by the production department. Development staff consists of four knitting technologists and two finishing specialists which is insufficient. It would be advisable to employ three more persons: one to take care of jacquard patterning; one additional knitting technologist for general product development; and one, less qualified to look after the machine settings and adjustments. No further personnel are required, at present, for finishing. This mill carries out fastness tests for all its development fabrics, but a special testing department will not be required as all other tests are carried out by two testing establishments in Budapest: TEXIMEI which serves industry and KERMI which mainly deals with the quality of garments. As the mill has negotiated reasonable changes and special quick service for the testing of its products, establishing its own testing facilities and increasing its staff for this purpose is not worth the cost.

Customer contacts

Váci Kötöttárugyár suffers, as does the industry in general, from a lack of customer contact. There is only one sales person, who has some technical

background but not enough to help the development staff by furnishing new ideas realizable by the mill's machinery, production facilities and capacities.

It is essential that the development staff be given the opportunity to attend the more important fairs, including the Paris exhibitions, to obtain fresh ideas and inspiration for the varied fashionable fabrics this firm produces. The money required for such travel is relatively little compared with the amount required for production and export. Váci employs its own designers but in an effort to get a closer relationship with the Fashion Institute, the latter provided designs for this project. However, Váci fears that the charges for designs and models made by the Fashion Institute will be prohibitive and doubts, because of the way the Fashion Institute operates, that a close relationship can be established.

The Váci knitting mill has a problem with their many Tomkins circular knitting machines which, because of their construction, produce vertically striped fabric. These stripes are impossible to avoid, therefore, an attempt will be made to either mask the stripes by printing or discover if mercerizing will mask them sufficiently to make the fabric commercially acceptable. If these attempts fail, it will be recommended that these machines be gradually replaced by other machinery.

The development work to be undertaken in relation to the UNIDO project is the siliconging of polyester fabrics for swimwear; better softeners to be applied to fabrics to improve handle and performance; and fabric mercerizing to be carried out at Budaprint.

E. Yarns

As far as can be established, the choice of yarns used by the knitting industry in Hungary, is governed by general official policies rather than the individual mills. In general, the trend in the knitting industry throughout the world is to use more spun yarns than continuous filament yarns. As natural fibres are in short supply, compromises are being sought in the form of blending fibres in yarn form. This is also being done in Hungary but more effort should be made to find the right types of blends for the different requirements. It is not sufficient to rely on the blends suggested by the large fibre producers as their interest is to include a maximum amount of their own fibres as part of the blends rather than quality of yarn. There are a number of component needle warp knitting machines in Hungary which could use spun yarns if suitable ones are found.

To expand the different production units in the warp knitting field by purchasing weft knitting machinery is an easy way to solve production problems but this would create competition within the group of mills where weft knitting is doing reasonably well.

II. A SURVEY OF VARIOUS ESTABLISHMENTS

A. Hodiköt-Divat

A well-run mill with a balanced development staff. The number of employees is approximately 4,900 of which 20% are administrative. The mill has a complicated structure and an extremely diversified plant which produces a high proportion of underwear, about 16 million garments per annum, and outerwear garments made on Cotton Patents Frames, flat knitting machines, and circular single jersey machines, and knitted caps and berets on special machines.

A general complaint is lack of marketing information. Also there is the problem of not being able to purchase their own yarn. This is done by the governing body, Hungarotex, and there is a delay of yarn supply in the region of from three to four months. About 60% of all yarns being used by this mill are imported from abroad and its main yarn consumption at present consists of:

Polyester and polyamides (230,000 garments per annum)
Polyester/acrylic (230,000 garments per annum)
100% cotton for blouses and pullovers (450,000 garments per annum)
100% polyamides for blouses and pullovers (515,000 garments per annum)

Plans for future yarn consumption include:

Polyester/wool blends
100% polyester spun yarns
Polyester/linen blended yarns

This mill would like to enter into fabric sales in addition to their garment sales and production.

B. Békéscsaba Kötöttárugyár

This mill is very much tied to cotton yarns for the production of children's garments and for plush fabrics. As its main production is geared to the home market, about 60%, its product development work is mainly concentrated on the remaining 40% which is for export. About 10% of the employees are engaged in development work.

This is a well-run mill. It is hampered in its efforts to meet export orders by late delivery of yarns. Békéscsaba employs the type of staff that would enable it to function well in a competitive market if it had a freer hand in handling its own yarn supplies and ordering to suit the type of production.

C. B.F.K.

This mill has centralized its Development Department, to which are attached 11 graduate textile technologists. As the bulk of production (50%) is for export to the Union of Soviet Socialist Republics and 40% is for the domestic market, development work is on about 10%.

This mill's particular type of trade simplifies customer relation to a great extent, and the mill claims that its production in the circular knitted field has been sold for one year ahead. This situation gives the appearance of self-assurance and self-sufficiency. Although the staff is technically qualified, this complacent attitude could very well place the mill in a difficult position if the market changes.

D. Magyarovári Kötöttárugyár

The mill is hampered by a large proportion of their production capacity being reserved for the production of unprofitable children's cotton garments for the domestic market. It is rich in ideas for development work and is employing 13 technicians for this work alone in addition to 55 persons on the making-up of new models.

The mill is labour-conscious and employs about 3,100 persons. It produces about three tons of cotton a week for bonding. Other fibres mainly utilized are: acrylics, wool/acrylic blends and wool/viscose blends. Production of new articles averages about 350 a year.

This mill does its best to keep in touch with its customers and claims that each year 8-10 of its staff visit trade fairs etc. abroad. Technically it appears to be sound.

E. The Fashion Institute

This establishment employs 386 permanent staff and about 114 temporary staff. It has a well-organized fashion department dealing with fashion, colour

and garment styling. On the knitting side it employs two qualified knitting technologists. The Fashion Institute covers other fields besides textiles, shoes etc. but the existence of such a large institute cannot be justified according to its usefulness to the textile industry. There seem to be a tendency to "empire building" and its relation with industry cannot be classified as good by any standards.

Streamlining its activities and pruning staff could make it considerably more effective. Should this establishment be chosen to direct technical service to the industry, methods of organization should be given the utmost attention.

F. The Textile Research Institute

This establishment is very much in contrast to the Fashion Institute in its build-up and attitudes towards the textile industry. It has been in existence only 18 years and has kept its staff to a manageable minimum. The knitting staff consists of 11 people. In addition it makes use of 2 qualified knitters from industry on an intermittent basis when required. Apart from a small knitting development department or unit, incorporating the basic machinery used in industry at large, it has a well-developed testing laboratory, a spinning unit, a chemical department and an instrument development department. It has a sensible attitude to both research and development work, and such work is done in a down to earth manner.

G. Hungarotex

This sales organization has all the necessary contacts with the different export markets. However, it does not appear to have the necessary knowledge of the potential of the many different knitting units it represents.

Its contact with industry is through the different managing directors of the units it represents. In this way, it has its factory contacts chosen for it and the people it comes into contact with are mainly on the fashion side. Hungarotex does not appear to differentiate between the technical development and fashion departments in the various mills. In addition, Hungarotex regulates imports of yarns for the production units. This may be a useful arrangement but is not the best way to serve the industry.

Hungarotex knows its customers and is very likely a good sales organization, well aware of quick market changes and the necessity for the mills to be able to react to a quick change-over of production. However, it does not give sufficient information to the mills and a much closer and better relationship with the knitting industry is essential.

III. CONCLUSIONS

Neither the industry nor the various sales organizations lack capability in their fields. This is also true of the Fashion Institute and the Textile Institute. However, as the mills and organizations are working independently, and appear remote from each other, both efforts and skills are to a great extent wasted. The main task must consequently be to overcome this remoteness and encourage the co-operation that can bring about the necessary change in development procedures and factory organization to the benefit of the knitting industry.

Product development departments in the mills should ideally come under the marketing and sales departments with close contact with production, but not answerable to the latter.

Wherever possible machines should be made available to the development units in each mill. This has already been done in some production units but mainly where machines are not too expensive and are rather versatile, usually the flat knitting machines. For factories using more specialized machines, such as warp knitting machines and raschel machines, the problem is more complicated. Occasionally versatile production machines are being replaced because of slow production and wear and tear. It would be advantageous if, instead of scrapping these machines, they could be reconditioned and overhauled and offered to the various development units. Such an arrangement would enable the development departments to experiment independently from production which would be less affected by experimental work. It would be impractical to install every type of machine in a separate development department, but even with a limited number of machines, the task would be simplified.

Development staff should be given more opportunities to contact customers, and to attend international fairs and fabric/garment exhibitions. There is a limit to the number of staff attending such fairs but it is essential for them to get first-hand information of what their colleagues and competitors are creating instead of learning from fashion magazines. In the latter case, their work will be a year or more out of date, which will prevent development staff from becoming leaders in their field and force them to copy instead of create designs a situation which is very much in evidence.

To keep travelling cost to a minimum one or two persons could visit important exhibitions, for example Interstoff, in turn. One day could be spent attending the Hungarotex stand to meet customers and get their reactions to products, and one day studying competitors' stands.

More effort should be spent on innovations within the knitting industry instead of spreading out into other fields even if, as at present, the market else where is more favourable. This will prevent friction within the group of mills and also prevent reducing sales possibilities of products already doing well.

A better relationship should be established between the Fashion Institute and the Textile Institute on one side and the knitting industry on the other. One plan- which should be thoroughly studied before being carried out - would be to create a Technical Services Department in either the Fashion Institute or the Textile Institute. The Fashion Institute might be a better proposition provided highly qualified staff could be recruited for this field. Such staff members would have to be development-oriented and have a sound production background and technical know-how. In addition, ability to co-operate with people would be important so that advice would be taken in a positive manner. Their main task would be to give ideas and advice, not impose their views on the development staff in the mills or give directives. Regular visits and constant contact with the development departments in the mills would be necessary for successful co-operation. There is a danger that a new department within the Fashion Institute could quickly become over-staffed and it should be limited to one specialist in each field, for instance, knitting, finishing and making-up. These specialist should be answerable to top management alone.

Secretarial and office administration for such personnel could easily be carried out by the present office staff.

The Textile Institute is carrying out a great deal of work, and on a sound basis. It does possess a number of machines that could be utilized, in co-operation with industry, for development and research work. Industry could make suggestions of what they would like this establishment to look into, for instance, to incorporate better yarn blends, optimal winding conditions for warp beams, yarn lubrication etc. Fabric development could also be

carried out in co-operation with the industry. The Institute has the machinery for such purposes, has mastered the technology and has access to the necessary testing equipment. Furthermore, it has specialists in spinning who could give advice in fields the knitting technologists cannot be expected to master.

These are only possibilities that exist for getting development work onto a sounder basis. To implement a change along these lines will necessarily take time and will to a great extent depend upon a positive attitude among all parties concerned. However, the present system and attitude spell difficulties for the future. If industry is to prosper and expand a fresh outlook must be contemplated. This cannot be achieved by directives, only by a desire for full co-operation.

It may be best, if the suggested Technical Service Department is financed by the industry itself, if not wholly at least to the extent where the mills would take an interest in its work and also have a say in how it should operate in relation to the knitting industry.

IV. RECOMMENDATIONS

1. Co-operation must be encouraged between the mills, the various sales organizations and the Fashion and Textile Institutes.
2. Product development departments should come under marketing and sales departments, with close contact with production, but not answerable to the latter.
3. Machines should be made available to development departments.
4. Development staff should be given opportunities to contact customers and to attend international fairs.
5. More effort should be made to develop products within the knitting industry rather than venture into other fields.

Annex I

JOB DESCRIPTION

SI/HUN/75/814/11-02/31.7.B

Post title: Product development expert(knitting)

Duration: Three months

Date required: As soon as possible

Duty station: Budapest

Purpose of the project: The Hungarian knitting industry has extensively modernized its production facilities and equipment during the last four years. UNIDO's assistance is requested to ensure optimum utilization of installed capacity, help out with organizational matters and advise on further technological development.

Duties: The expert will carry out his duties in a Hungarian enterprise - Habselyen Kötöttárugyár - chosen by the Ministry of Light Industry. He is expected to:

1. Elaborate and initiate the implementation of a product development programme with the view of further application in other enterprises;
2. Advise on the selection of appropriate technology for the production of knitwear;
3. Assist in the preparation of a fellowship programme in product development of knitted fabrics;
4. Co-ordinate his activities with those of the mill management expert.

Qualifications: Textile scientist or engineer with background in the knitting industry and experience in product development.

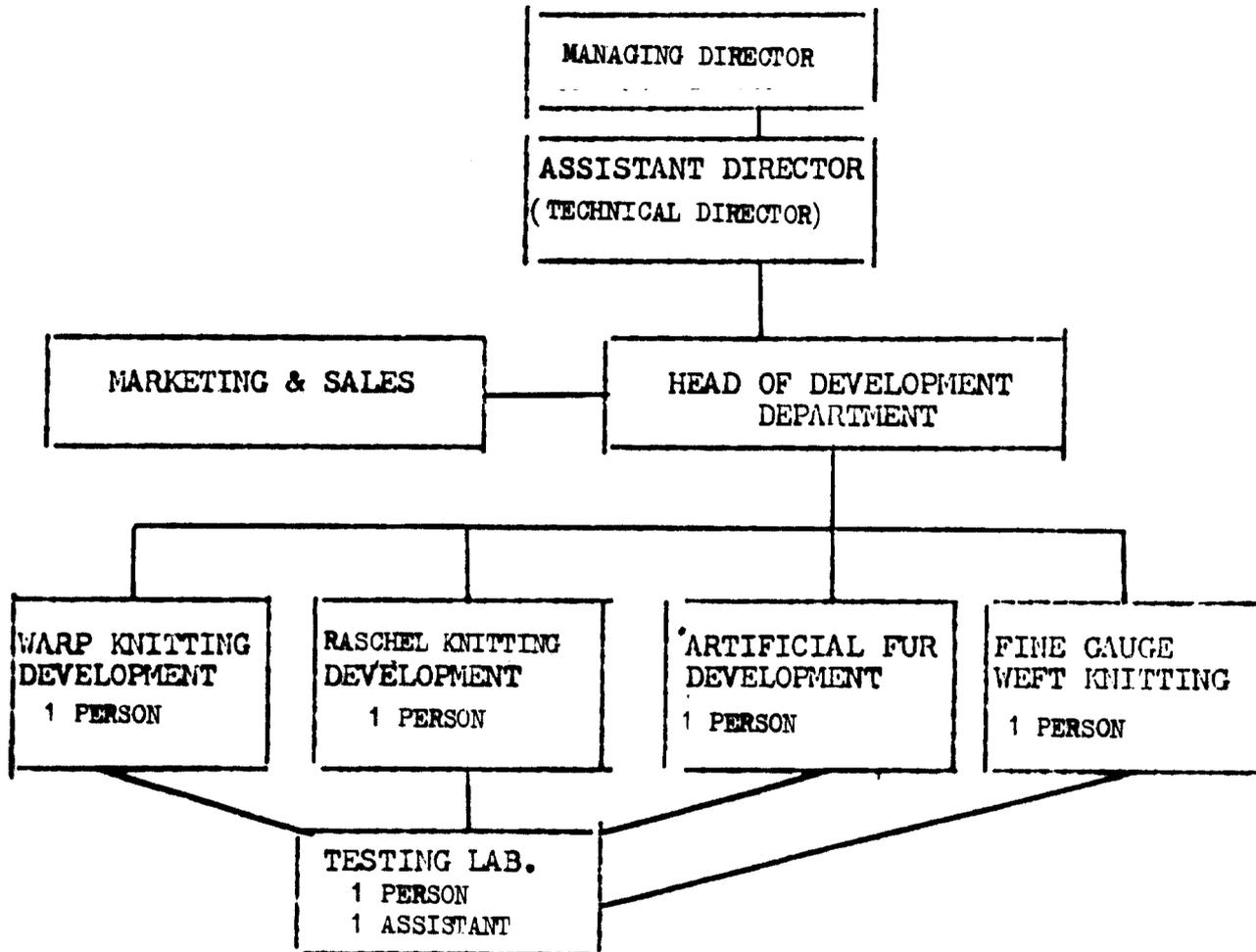
Language: English; German desirable.

Background information: The knitting sector has an important role to play in the development of industry in the Hungarian People's Republic. It is expected to provide an impetus in the increased production of fabrics and a wider choice of consumer-oriented products. There are currently eight large knitting factories and four factories and co-operatives of middle size.

Statistics show that the production of the knitting industry has increased by fifty per cent in the last five years. The recent expenditure for the development of this sector should result in an even higher increase of production and more rapid product development.

Annex II

PLAN FOR A PRODUCT DEVELOPMENT DEPARTMENT
AT THE HABSLEYEM KNITTING MILL



In addition, direct contact with the laboratory scale finishing situated in the main finishing department must be planned.

Likewise there should be set aside a small sewing and making-up unit for wear trials and assessment of new fabrics in garment form.

Annex III

EQUIPMENT FOR THE PLANNED DEVELOPMENT
DEPARTMENT AT THE HABSELYEM KNITTING MILL

Warp knitting section

One two-bar warp knitting loom. One four-bar warp knitting loom.

Raschel machinery

Because of space required and availability of production machinery, it is not advisable that any separate machine be installed in the development section for this purpose but actual development work should be carried out on production machinery.

Artificial fur machinery

As this is an entirely new and separate venture it is not recommended that extra machinery be installed for separate development work, but that actual development work be carried out on production machinery.

Fine gauge circular knitting section

There should be no necessity for separate machinery for development work. The technical aid and know-how given by the company operating with Habselyem at present will reduce work in the development field on fine gauge machines. Any other development work can be carried out in the production unit.

Testing laboratory

Although there is a small testing unit at Habselyem, it is attached to the production department. However its equipment is not suited for the satisfactory testing of development products and a small but well-equipped testing laboratory should be attached to the Development Department for their use only.

This equipment should include:

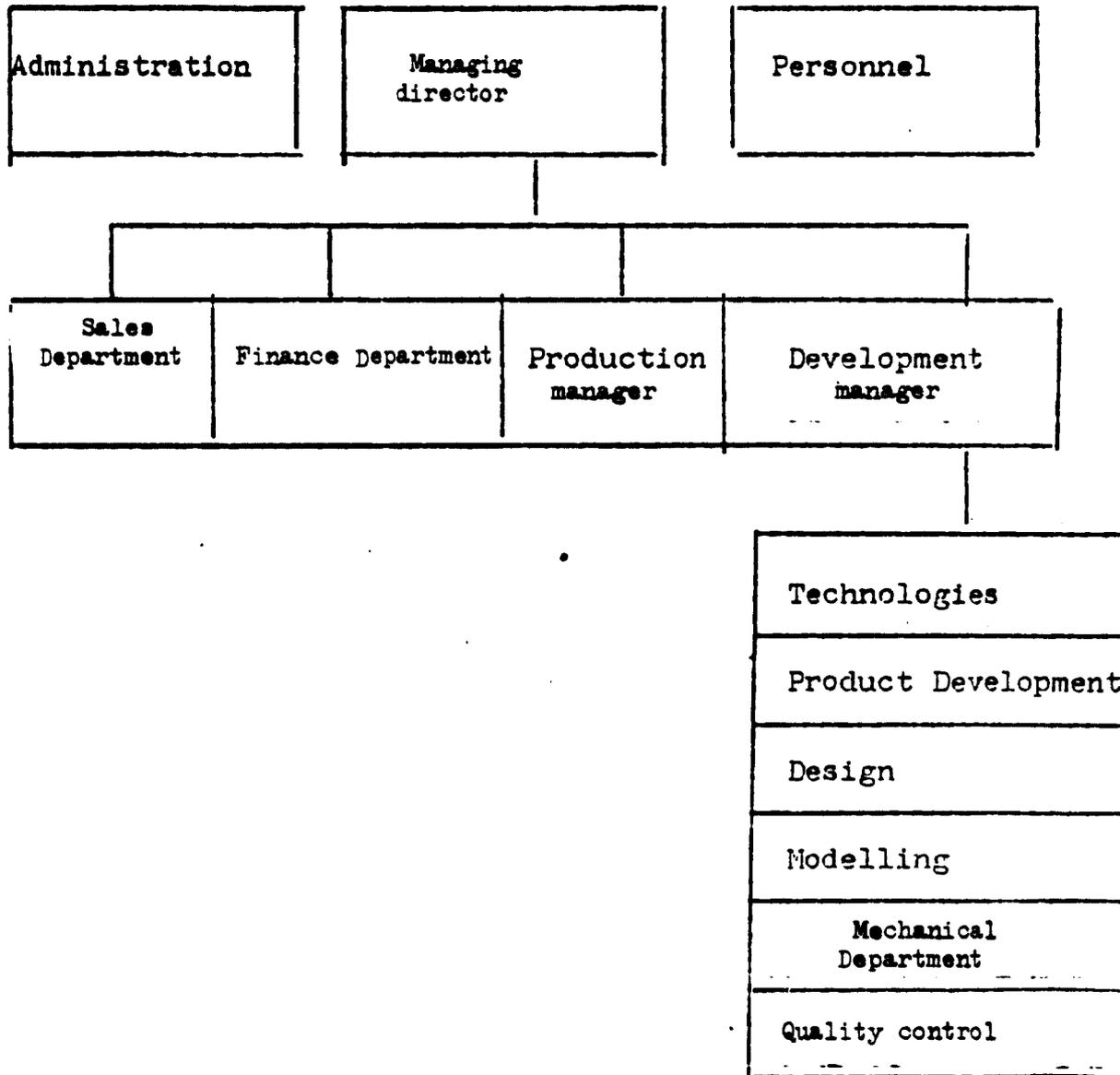
- Apparatus for testing recovery from extension of knitted fabrics
- Fabric-strength tester
- Pilling tester
- Crease-resistance tester

Although these recommendations cover a bare minimum of equipment, more cannot be recommended because the staff required cannot be justified and the costs would be too high.

All other tests required may be carried out through the Textile Research Institute. It could be argued that all testing should be taken over by the Institute, however, as it is no part of Habselyem priority cannot be claimed for urgent work. Even for routine work the Institute is hampered with what appears to be organizational problems, and also, it is felt by industry that the service charges are expensive.

Annex IV

ORGANIZATION CHART FOR VÁCI KÖTŐTÁRUGYÁR



C-688



78.11.22