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TRAINING OF INDUSTRIAL INFORMATION OFFICERS
FROM DEVELOPING COUNTRIES^{1/}

by

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^{1/} The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the secretariat of UNIDO.

We regret that some of the pages in the microfiche copy of this report may not be up to the proper legibility standards, even though the best possible copy was used for preparing the master fiche.

An information system is understood to be a special organization directed by definite rules of operation to keep up services for the oral or written numerical or graphical record of a past, present or future event, activity or condition in a given field. An information system covers several sub-systems like for example the industrial information system, the statistical information system, etc. From these examples it is quite obvious that the sub-systems overlap each other, so that an information system cannot be regarded simply as the sum of the sub-systems.

This situation is further complicated by the fact that an information system as well as its sub-or partial systems can be built up both on national and international levels. Furthermore, a national system or sub-system can make use also of an international system or service organically built into its own system; a national system can also act as a sub-system within an international system.

Information systems can be developed into information networks. Generally, we speak about an information network in the case of using uniform equipment /e.g. computer-network/; utilizing similar information media /e.g. film/; or performing similar functions /e.g. library-network/. In most cases, an information system is understood to be a certain combination of the above-mentioned three elements.

Documentation is understood to be the collecting, registering, classifying and processing of documents in order to make them available for information purposes. Documentation is of great value to information services in the fields of science, research, industry, economics, etc. Therefore to organize documentation is an indispensable prerequisite to the information services.

The document is understood to be the subject of documentation. Recently the term "document" has developed a more general usage according to which all basic materials containing information can be regarded as documents. The classical scientific, technical, economic document once consisted basically of books and periodicals. Nowadays we distinguish between

- documents of special literature;
- that published or commercially available special literature which can usually be found in libraries and includes books and periodicals;

- those kinds of special literature which are usually not commercially available and cannot be found in every library; trade periodicals and trade literature; research and development reports, dissertations and travel reports;
- patents, standards, regulations and instructions should be mentioned with emphasis as they are of special importance from the point of view of industrial information;
- scientific and technical films as information media /the films themselves being found in film-libraries/;
- other audio or visual aids as information media /which usually can be found in special depositories/.

These are the most important categories but just on the field of industry one can not forget the minutes of negotiations, the important information included in correspondences, etc.

Lately, the documentation of data and the separate collection of data have growing significance. They can also be organized in two ways - documentation containing critical data consisting of supervised data only, or documentation covering any sort of data aimed at further usage. The store of data available for certain users is called a data-bank.

Documents are collected in depositories. Their arrangement depends on the information media, i.e. the kind of documents. Even within the same kind there are many possible variations. Whatever the document, there are many different methods of processing and making it available.

In the field of scientific, technical and economic special literature and in its processing, we can distinguish between two types of institutes which frequently appear as separate sections of the same organization and have two different tasks:

- a special library which has the task of collecting, classifying, storing and making the documents available and
- an information centre or unit which differs from a special library primarily in the inequality of its input and output. It does not necessarily have a depository of its own and in rendering information services may use documentation from other sources.

In several countries, including highly industrialized ones, such as the United Kingdom and Canada, the special libraries are at the same time documentation and information institutions. We can also find examples of information institutes creating a special library and documentation section (e.g. CIPIB in Hungary).

It is apparent that "the term Industrial Information is used in an industry-orientated context to mean specific items of scientific, technical and economic knowledge that can be communicated and applied in order to facilitate and accelerate the process of economic growth."

Talking with leading industrial experts about the importance of information it is often said that information is important for industries but this is something quite different from libraries, differs even from special libraries, libraries have nothing to do with this sort of information.

This opinion is reflected also in the resolutions passed in the above-mentioned Seminar held in Tashkent. Participants of the Seminar were experts working on the fields of industry, or in decision-making bodies controlling the industry.

"It was recognized that documentation centres often disseminated information irrelevant to industry and the need for supplying selective and useful information was emphasized. Wherever possible an industrial information service should be separated from the basic scientific information service."

Further: "The association of industrial information services with other services such as existing library services and particularly with industrial research institutes was also discussed. It seems to be advisable to link industrial information service with the industrial research institute wherever it exists." However, it must be admitted that experts, who, referring to personal, financial, etc. problems, are right when intending to attach information services generally-but especially in developing countries-to the network of special libraries to be found at

* Industrial Information. UNIDO Monographs on Industrial Development No.13.p.2.

Just in its germs nearly everywhere or to a single big special library.

Of course, the document basis for industrial information services is only partially equal to that of a standard library. But this partial equality and the fact, that libraries have their specialists who are familiar with collecting, registering and making many types of documents available, makes it possible for libraries to handle new types of documents and to effect their own processing and circulation without reducing the document bases of industrial information for that of a standard library.

I consider important to emphasize that narrowing down the concept of information to a single type of information would by no means be right. It seems just as wrong to me to equate information with information taken from special literature and therefore to overestimate the role of libraries as-for example in the case of industrial information - to deny entirely the role of the libraries appreciating only other, not classical forms of special-literature in information /e.g. exhibitions, personal talks, etc./

Experience proves, that the network of technical libraries in many countries is able to supply users on different levels as well in the field of technical sciences as in the field of industry. Some libraries have started collecting audio-visual materials.

May we organize information services anyhow, generally and specially for the industry, by all means we need satisfactorily trained experts who produce and who use the services.

2. ON THE TRAINING OF INFORMATION EXPERTS IN GENERAL

To begin with one has to point out that information work needs on nearly all substantial fields a triple qualification: competence in the field which furnishes information, expertise on the domain of information work and at least passive knowledge of foreign languages.

The object of information services serving industry - as we have already noticed - is to provide industry with information necessary to development, to keeping the level and to marketing. This information service is closely connected with the controlling of the national economy, respectively with the technical development, the economic and the commercial activities of enterprises. It is quite obvious that this aim specifies the demand for experts, respectively the ways and means of training experts to be engaged in this field. As industrial information is a special concept within information in the whole, so is the expert /and its training/ providing industrial information more specialized compared to experts /and their training/ working in general information services.

After all, we are talking about economic and technical information supplied from a greatly expanded information basis compared to the classical one. /This is the reason why many experts deny the necessity of dealing extra with industrial information./

The enterprise itself serves also as an information basis: the enterprise has to supply information about itself to the market, to the partners and to the masses.

It must be pointed out by all means, that supplying information is a profession which must be organized, developed and taught. And the users of information must be taught also what sorts of requests can they make of the information suppliers: the users must be taught how to put questions. Without trained information-suppliers and trained information-users there is no possibility for organizing information-systems, not even an information centre or information bureau of an enterprise can be established without them.

"... the involvement of scientists in information matters is an indispensable complement to the specialization of documentalists in science information. In this section we have first reviewed how authors can help to meet the information requirements of potential users, then the emphasis was on turning users into information officers of the highest grade, for the preparation of critical reviews. This cycle of analysis and synthesis involves scientists, not documentalists; and the question arises of re-defining the relation between the two professions. A redistribution of tasks will have to be provided for, with scientists taking on the more content-oriented tasks of document and data analysis, as above and documentalists, archivists, librarians, etc., adjusting to the new technicalities of information transfer, in so far, as they do not call for a deep understanding of document content and significance. In both directions education programmes are needed. Such programmes exist in a few countries but are aimed at relatively small populations of scientists and documentalists, in privileged environments; there is room for more extensive training efforts, on an international scale, in order that no nation or professional group be at a disadvantage with respect to the quality of its contribution to world-wide information transfer."⁴

This quotation is from the UNISIST Report, surely known by those present or at least know the discussions about this system organized by UNESCO on inter-governmental level where developing countries had important role. I think, instead of "scientists" "scientists, technicians, economists and other specialists" could be said, and so the citation seems to be true in the case of industrial information.

According to experiences gained in Hungary, those experts can execute information work requiring professional skill on the best way, who not only know their profession but also live in it: are not employees of information institutions but active workers of institutes, enterprises, occasionally of governmental offices.

+ = UNISIST - Study Report on the Feasibility of a World Science Information System, V.I.2.3, p.65.

These are the persons who can suitably select out essential things, not in general but according to the needs of the country corresponding with the considerations of the enterprise, keeping the object in view, for the sake of which the given information is necessary as well as the person and its "level" who receives the information.

Detail quoted from the 13. Recommendation of the UNISIST Report:

"For all nations to take an active share in the operation of international information systems, a concerted effort is needed to provide information specialists, librarians and documentalists, with improved educational facilities..."

I believe, this is not only for the participation in international information systems true, but also for developing the own internal information system and for the industrial information system as well.

Talking concretely about the training of experts needed for the industrial information system, the following questions should be discussed /the discussion of the following questions is recommended/:

- what sort of experts does the industrial information establishment need, with special respect to the developing countries?
- according to which system should these experts be taught and for what?
- what should users be aware of and how can they get acquainted with the particulars?

In the forthcoming I shall shortly summarize my own opinion about the formerly raised questions to introduce the discussion.

3. THE DEMAND FOR EXPERTS IN INDUSTRIAL INFORMATION WORK

Quoting UNICEST again:

"...the level of proficiency observed in some parts of the world - both developing and developed - can be shown impartially to remain below the requirements of information processing in a modern sense, either from a qualitative viewpoint /inadequate programmes/, or quantitative /insufficient number of skilled personnel/, or both."

Thus, in this respect the world is not divided into developed and developing countries, but into countries where training - necessary to information services - have been organized and into countries, where not. Of course one has to see distinctly the different possibilities in developing and developed countries when arriving at a decision to organize this training, caused partially by financial and partially by personal conditions.

Let us see the "ideal" case first: let us try to select the necessary expert-types, knowing that their training separately is not by all means possible and necessary even for the most industrialized, richest countries.

Documents are collected in depositories. One has to know the finding place, the methods and possibilities of collecting, classifying, etc. of all types of documents /librarian, recorder, keeper of standards, etc./ Different types of information-media comply with different types of information-depositories /film-libraries, audio-depositories, archives, libraries, etc/, nevertheless, classifying and registering principles do not differ inasmuch that certain registration methods of the classical library could not be employed on the field of other recordings.

Impliedly we always suppose that everybody is able to write a

Quoted work 6.5 p.106

book, an article, a product-inspection, etc. and its methodology needs not to be learned extra. /It is not quite sure, that this suggestion is correct but now we do not have possibility to deal with this problem in detail/. However, we can not even implicitly assume, that everyone can produce and employ information-media of non-special literature, therefore specialists for producing audio-visual material are by all means needed. This problem gets special highlight because just in the developing countries these information materials are of great importance.

Information are processed, documented and kept available for furnishing information. Processing has different types and demands different professional and information qualifications extending from typing to computer-programming, from proficiency in foreign languages to great professional skill.

Information are compiled of the documented material, are selected and evaluated to serve the purposes, eventually they are issued in publications. This again needs another type of experts.

Information-work is developed, the system organized and results yielded elsewhere are adapted. Once more another type of expert.

Training therefore must be organized functionally but at the same time also according to information-media. Organizers have to be trained as well.

The types can be expected something like as follows:

Collecting information

- collecting and making special literature available;
- collecting and making tapes, films, etc. available;
- collecting and making available information obtained on discussions, negotiations and through correspondence /however, after being written they immediately can be administered in the same way as information on special literature/.

Necessary experts are: special librarian;
film-librarian;
archivist, etc.

Processing information

- cataloguing special literature /for library purposes/;
- processing special literature /for documentation purposes/;
- processing other information-media /for documentation purposes/;
- collecting data out of documents;
- analytical, evaluating processing of information in documents.

Necessary experts are: special librarian;
documentalist;
audio-visual expert;
organizer of exhibitions, etc.

In addition technical employees, managers and organizers are needed.

That the matter is industrial information, can first of all be seen from the fact that we must rely mainly on the co-operation with technical and economic experts when processing types of information-sources necessitated by industry.

To sum up, the following types of experts are therefore necessary:

- special librarian;
- documentalist;
- special translator;
- methodological fellow-workers who organize and develop information work;
- expert with technical qualification;
- economist /statist/;
- marketing expert;
- expert producing audio-visual material and specialist of audio-visual communications;
- audio-visual methodological specialist;
- reprographist;
- editor, etc.

Special librarians, documentalists, special translators, economists have to possess experiences in the special line, experts with technical qualifications must gain knowledge of information work.

Generally the entire spectrum is not needed of course and speaking about training -at last in approaching it first- there are several chances for contractions. Feasibility of international co-operation must also be taken into consideration. For example developers in developing countries /and in smaller developed ones/: after my opinion they are not needed in a number that their training should be organized: the few experts, necessary on the separate fields, can be trained in industrially advanced countries, where the respective training had been organized because of the amount of demands.

4. IN WHAT SYSTEM AND WITH WHAT CONTENT SHOULD DEVELOPING COUNTRIES TRAIN THEIR EXPERTS WORKING ON THE FIELD OF INDUSTRIAL INFORMATION?

I hope, it can be conceded as a general principle, that it is not too expedient to train experts of this field, mainly requiring duplex, but often even triplex qualifications, in one step.

It seems to me, that the most logical solution is to build the next group of attainments on the previous qualification gained in the school-system.

The Committee of Education and Training of the International Federation for Documentation /IFD/ET/ has compiled a manual on the training for documentation and information work going on throughout the world.⁺ From this publication we get information on the training in progress in 159 institutions of 47 countries.

⁺ = Training Facilities In Documentation and Information Work. Second Edition, FID 461. 1969.

The handbook enumerates the following types of courses:

- "- post-graduate /where a university degree is the condition of admission to studies or courses leading to the degree or sometimes only to professional qualifications/,
- graduate /where a secondary school education is required and training leads to Bachelor, Master or Doctor title/,
- non-graduate /where a secondary education is required, and the training does not lead to a university degree, the trainees being granted only a diploma or certificate of professional qualifications/,
- special /special courses are those in some speciality, such as classification, patents, mechanization, etc./

For some courses, the level of training is not marked, because of lack of adequate information. Some courses, both introductory and advanced, admit graduates as well as non-graduates, and it has therefore not been possible to define the level clearly."⁺

Reading through the publication thoroughly I got convinced, that the training accomplished on many ways may result in equally well-trained information experts. There are certain forms of training, requiring professional skill on higher level and building knowledge of information science upon this; there are forms of training, where the two different stocks of learning are taught parallel and there are countries, where in essentials only training for librarianship is going on without parallel vocational training suitable for the industry, what implies, that trainees have to acquire the professional skill in practice /or eventually later, on courses/ as otherwise they cannot fulfil their obligations. The question arises: which are the most feasible arrangements for developing countries?

We can more and more frequently read in the literature, hear at conferences, seminars and personal talks, that technical experts

⁺ = Referred work p.9-10.

of developing countries trained in developed countries can not find their right place in their own countries as they do not have adequate openings to their requirements and suitable positions corresponding to their abilities. There is an overflow of experts and this excess of specialists either does not work on its own professional field or looks for a job outside its country - in all cases in least for native developing possibilities.

Utilization of these experts on the field of industrial information work seems to be useful. This can be done by organizing courses for them in their own countries - or in the beginning rather on international level - where, in a few months they acquire the knowledge they need to execute information work. Regarding training for information work UNIDO already follows this practice since a few years.

As for developing countries in general practice is more important than theory, stress must primarily be laid upon the mainly practical training on these courses. The purpose is served by sending those, who seem to be apt to carry out organizational, methodological and managing work, for longer periods with scholarships into well-run information-institutions of different types. The very small number of eventually needed developers may also be trained with scholarships abroad, in developed countries.

Thus, in my opinion, in countries with developing industry those specialists with degrees in natural science, technique, economics, etc. /engineer, technician, economist, etc./ may primarily be initiated, who acquire their informative experience in the frames of some extension-training in special courses. The training in courses enables differentiation what can be based either on the special field to be supplied or the similarity of scopes of activities and similarity of information levels.

On the intergovernmental UNISTAT Conference 18 developing countries have expressed their opinion sharing the same view, namely that it is essential that UNISTAT must have from the start, a strong training programme as a top priority to enable the developing countries

to make the full contribution to the successful functioning and utilization of its results. The director-general of UNESCO was requested to prepare a long-term project within the frame of the UNISIST programme for international assistance to developing countries in its implementation with special attention to manpower and institutional development which could enable their active participation in information sharing of international scope.

I should like to dwell a little longer in details on the three-months course held by UNIDO and the Soviet Government with the support of UNESCO organized by VINITI for information experts of developing countries in 1970 in English and in 1971 in Spanish languages. /In 1972 UNIDO and VINITI intend to organize a course in French./

In 1970, on the first course, 34 participants were trained coming from 23 developing countries: in 1971, on the second course, 16 participants were present from 12 Latin American countries.

Based on the experiences gained at the first course, a greater stress was laid upon practical training. The available 200 hours were divided as follows:

	in 1970:	in 1971:	
theoretical education.....	} 70 %	46 hours	} 48 %
discussions.....		50 "	
practical training.....		30 %	

Trainees had the opportunity to get acquainted with the information work of great Soviet information institutions, institutes and industrial units and they had the opportunity to discuss their own experiences with each other.

The theoretical material of the course extended to the following:

- problems dealing with scientific and technical information activities;
- documentary sources of information;
- kinds of information publications and their preparation;

- reference collections;
- UBC;
- information retrieval systems;
- mechanization of information processing;
- application of computers and electrographic means for information processing;
- functions of scientific and technical libraries;
- organization of scientific and technical information activities in different countries;
- activities of international organizations in the field of scientific, technical and industrial information.

Based on experiences the preliminary conditions of the success of of a course like this can be summarized as follows:

- written material of the course must be prepared in good time, participants shall receive it in due time to have time to prepare for the participation. Being acquainted with the topic of the course helps the competent organ of the sender country as well in finding the most adequate applicant to participate in the course.
- the knowledge of the trainees should possibly be on the same level and the range of their interest should also be similar. The well in advance prepared material of the course means also a help in this.
- all participants should command the working-language of the course on a satisfactory level.
- all participants should take active part in the work of the course, everybody shall give full account of the respective situation in his native land, of their experiences and views.
- the time-table shall not be overcrowded, there shall be enough time for individual work and discussions with the lecturers and with each-other.
- In spite of the fact, that always great interest is shown in theoretical questions, the course should be practical, shall provide opportunities for gaining experiences in information institutions. The visiting of these institutions should be organized well.
- last but not least: the invitation of lecturers with thorough

theoretical knowledge and wide experience must be ensured.

Dr. A.G. Chakhakhchyan, director of the Research-courses reaches the following conclusions from these courses:

"...training of information officers /for developing countries/ should be realized by various methods, depending on the tasks set. Apparently the most expedient forms of training information personnel are courses, seminars and in plant training. A training course is the most effective form of training information personnel."

And later:

" Another effective form of training industrial information officers in the developing countries is seminars for the developing countries held in one of them.

At the seminars a small number of questions shall be discussed. Qualified specialists should be invited to make reports on urgent problems. A comparatively large number of participants from the developing countries of a given region can take part in the seminars."

" To our mind, UNIDO should make wider use of training industrial information officers as in plant training. Representatives of the developing countries could be granted scholar hips for 2 or 3 months or longer to enable them to master all the processes and stages of information work of a certain information services in plant training should be arranged at those information services that could be of utmost use for the fellowship-holders in their future work".

I for myself agree wholly with these statements.

Regarding the content part of training in general, I believe, great attention must be drawn to what users and especially what users of

* = Dr. A.G. Chakhakhchyan: Some Methodological Aspects of Training Industrial Information Officers for the Developing Countries.

developing countries say. I think, care must by all means be taken to adapt from the curricula of classical library schools only, what is really necessary and the great stress should be laid upon questions important from the point of view of industrial information.

It must also be taken into account, that even if developing countries would have financial possibilities for operating the most modern computing systems, they generally do not have the intellectual, technical or organizational preconditions needed to the efficient utilization of the complex information system - as often the possibilities offered by these systems could not be fully exploited even in the developed countries. This fact determines in many respects the direction of the training.

The ISLIC⁺ Conference yielded the result regarding the training of information experts, that the training of information experts is very important for developing countries, but more information technicians and more information specialists should be trained and less information scientists. This too is a guidance regarding the content of the training.

The Inter-regional Seminar on Industrial Information, held between 13-24 September, 1971 in Lima, organized by UNIDO and the Peruvian government, presented the following suggestions:⁺⁺

"It should be considered that besides Seminars in industrialized countries for highly qualified personnel, there should be more courses on the spot, that is in developing countries, for personnel on medium level."

+ = International Conference on Information Science 1971. 21. Aug. - 5. Sept., Israel.

⁺⁺ = UNIDO ID/WG.103/6 Annex IV.

5. WHAT HAVE USERS TO KNOW AND HOW SHOULD THEY BE TAUGHT FOR IT?

C. Vernimb[†] writes: information demands activity also from the part of the user. We serve in vain the best book if each does not eat his own. With other expression: we are opposed to the inertia moment of the user, who has to digest the information received in black and white.

The separate groups of users and within these the individuals have different opinions about the information work, about its necessity and appreciation. Many things about this fact are brought to the surface by seeking behaviour of the users.

To use industrial information is economic interest, the raise of nations may depend on it as it can fasten development. Therefore we do not only have to produce information and to make it available, but also have to help the efforts to translate the theory into practice, that information should be used instead of wandering into the litter. Therefore potential users can not soon enough be familiarized with the idea of requiring and using the information services.

The best solution seems to be to teach future users of industrial information already at the universities, high-schools and industrial school-level, what information services and what publications do exist on their special field of interest, how can they acquire them and how can they make use of them. A training like this is going on for example in Hungary at the technical universities.

It is expedient to organize -if possible- short courses for those users, who have not learnt the employment of information in school-education within the frames of learned associations /if they exist/. Many countries have gained experiences in this field, e.g. the UK /ASLIB/ the Polish People's Republic, Hungary. Our experiences prove, that these courses help the utilization of information in a

[†] = C. Vernimb: Über die Zukunft der wissenschaftlichen Information.
/On the Future of Scientific Information/ Buchr. u. B.
22/1977/No.1. p.2

bright way.

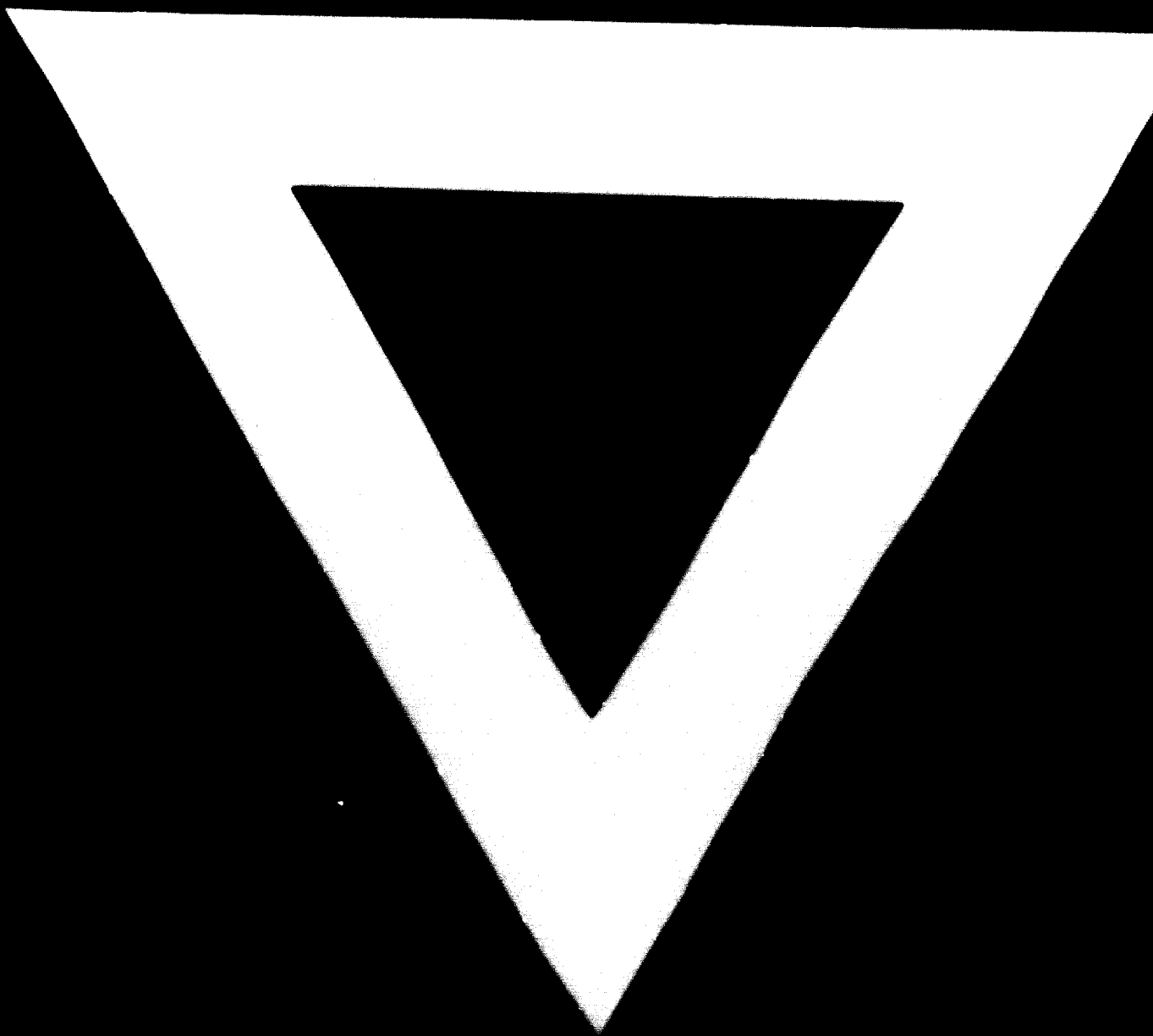
The Educational and Training Committee of the International Federation for Documentation /IF/ /IS/ programme for 1971/72 mentions as regards user training the elaboration of a general elementary programme for information and documentation for persons already active in the professional field.

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It is to be stated by all means, that the training of industrial information experts requires great efforts both from developing and developed countries -but these efforts are necessary. UNIDO and other international organizations as well as helpful national organs can help the developing countries, but developing countries themselves and their responsible governmental organs can not be fully released: there is a need for their efforts, for organizing the national training as otherwise no efficiently trained information expert will be available to promote and accelerate industrial development.

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