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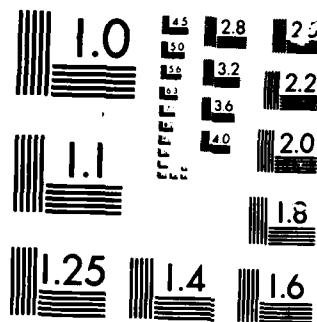
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SCIENTIFIC AND TECHNICAL INFORMATION SEARCH AND SERVICE IN THE
RESEARCH AND DEVELOPMENT OF MILITARY PRODUCTS

by

Wang Xiu Cheng



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Scientific and Technical Information Search and Service
in the Research and Development of Military Products

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Wang Xiu Chen

Abstract

Combining working experiences, the relation of search and service of technical information and research and development of military products, the necessity of the support of strategic and tactic information, and their relation are clarified. The special features of technical information of military products and the channels to obtain such type information are also clarified. *How to obtain technical information of military products is discussed in this paper.* Several important stages of technical information search and service are discussed in the end of this paper.

1. Introduction

There is a famous saying: "If you know your enemy as well as yourself, you will certainly win the battles." This is true for military battles, and this is also true for research and development of military products. How to know your enemy as well as yourself? It is a common sense that it can be achieved only by means of information. But how to use technical information to serve research and development of

military products? In this article, combining the real situation of technical information search and service, the above problem is discussed.

2. A Flow Chart of Research and Development of Military Products and Support by Technical Information Service

(1). A flow chart of research and development of military products

The flow chart of a military product, from the determination of the task by the administration to submission of the prototype model by the manufacturers, generally consists of a process as the following:

Government Plan, Requirements of Military Force, Requirements of other departments, — Determine the Task and Make General Policy —

Send the Task to the Contractor — Preliminary Studies — Proof of Plans —

Topical Studies and Proof of subsystem — Design of Products and Processing — Manufacture —

Prototype for Property Testing — Prototype for Production

(2). Support by strategic information

From the overall consideration, technical information

is needed almost in every stage. But the quantity and quality requirements are different in each stage. Usually, before the determination of developing a product, strategic information, which is organized by information study and analysis, is needed. It offers correct information about the problems such as the reason of development, critical technology, future prospect, cost and efficiency, etc. There are situation introduction, information analysis, comparisons, and suggestions in the submitted information report.

In order to support the research and development, we edited strategic information of different topics to help decision makers to know the situation, to make judgement and decision. Without doubt, the more information the decision makers know, the greater their ability and resolution of making judgement will be.

(3). The support by tactic information

During the stage of the preliminary studies and proof of plan, mainly the following information should be supplied at first: the general situation of the research and development abroad about the same type of product, the specific plan used, the route to solve the critical technology, etc, that is, to supply the information of the whole product from the viewpoint of system engineering. After that, the aim of information service is mainly to

66

supply tactic information of specific problems in order to fulfill the task of the whole project.

When the decision of developing a new product is being made, it will be very helpful to obtain one or two sets of systematic technical information of one or two similar foreign products which have already succeeded and are technically advanced. This "one to one" comparison is not only a straight way to success for research personnel, but also can greatly save their time used in information search and plan proof. We can take the advantages and avoid the shortages and mistakes of foreign countries based on their experiences of successes and failures in this product.

Generally, a good project is the key of success for the research and development of a new product. If there is no similar foreign product as model, it will be very difficult to decide the technical parameters of the product under development. Even when such parameters have been decided, they lack the scientific base, and they will be revised again and again while the project is carried out and even can be overthrown totally. Thus a great amount of manpower, materials, and time are wasted. This will directly influence the progress of the modernization of the defence, as well as the progress of the Four Modernization (comment of translator: the Four Modernizations are defined by Chinese government as: the modernizations of agriculture, industry,

defence, and science and technology).

3. Features of Foreign Technical Information of Military Products and the Search Channels

(1). The Features of foreign technical information of military products

The main feature of foreign technical information of military products is the nature of secrecy. The process of information releasing is as the following chart:

Top Level	___	Lower level	___	Unclassified	___	Public
Secret		Secret				Publishing

Generally the research and development are carried out secretly. This is especially true for tactic weapons. But military products are usually suggested by the military administration, then contracted by companies and manufacturers. Therefore, the research results might be released via several channels such as patents, research reports, journals and magazines, technical meetings, etc. That is, the products are kept in secret but the theories and technology are difficult to be kept in secret, and the research results are to be applied for patents, because too much secrecy will impede the technical communication and the development of technology itself. With time, the secret information will automatically lower the level of

secrecy and eventually lose the reason for being secret. Even during the stage of secrecy, we still can use the penetrating nature of information to obtain the information wanted.

Take radar technology as an example: the research and development period of a new foreign product generally require 6-8 years. As soon as the new product has been developed, because of the competition the old products will be replaced gradually. Therefore the old products will no longer be kept secret eventually. If we can take advantage of this law, it will not be difficult to obtain technical information of the related products.

(2). The search channels of the technical information of military products

Generally, there are four channels which can lead to obtaining the related technical information of foreign military products:

- a. The models and types of the specific product (code numbers or names),
- b. The companies and manufacturers which signed the contracts,
- c. The authors of technical papers and documents,
- d. The reference literature.

As soon as several typical papers or documents are obtained, we can enlarge the search according to the

references at the end of each paper. In this way we can obtain rather systematic and overall technical information of some specific topic.

During the stage calling for tenders, usually no secrecy policy is enforced for foreign military products. For example: immediately after the US airforce released the contract information of the AN/APG-63 plane-carried radar system for US. F-15 fighters, 10 aviation electronic companies replied. As a result of the competition, the airforce chose Hughes and Westinghouse as the competition contractors for the F-15 radar system in November of 1968. The Airforce supplied these two companies \$ 11 millions as research money, respectively. In the summer of 1970, the model systems developed by these two companies were used in the competition testing flyings for two months (105 times total). Finally Hughes company won the competition on december 30, 1970. When we search for the information of AN/APG-63 radar system, if only we search along these channels, it will not be difficult to obtain the basic information, especially the information which was already published and partially open to the public of the related meetings, technical reports, and patents.

4. The Routine of Information Service

67

After a research topic is determined, the routine of information service is as follows:

Research topic — Making Outlines of Index Searching — Searching for Topical Indexes —

— Searching for Detailed information — Classfying the Information — Submitting for use

Following is our specific method in several important stages of information search and service:

(1). Searching for topical indexes:

The information service staff should list the outlines of information searching, according to the key technical problems pointed out by the research staff, using every kind of information search tools. This is a very complicated, tedious, and cautious work, requiring patience and commitment of work.

Generally, when we offer service to the research and development of some military product, we always let some people carry out the task using different search tools. Finally several hundreds to even several thousands of index cards were submitted to the related research staff and chief designer, and they will choose several dozens out of these cards and classify them into three groups A, B, and C. Group A is the most important information; it has very important reference values for the product research and design. Group B is relatively important, and group C has only very general

reference values. There is an old saying that no one should be worried if one has enough grain in his own hand (Comment of translator: In ancient China, grain was a major product and had important position in economy). So that if we have many information clues for the related topics in our hands, we can obtain useful information in case it is needed. If computers are used for the information search, a great amount of manpower and materials can be saved. Also the work will be done faster and better than by manual searching.

(2). Searching for the information

After the index searching is finished, the next step is to search for the detailed information. In order to save money, first of all, collection of information from one's own library should be fully used. Only for the information which is not available in one's own library is it necessary to write or send people to other libraries for getting this information. Such search should be concentrated on the papers which have the most important or very important reference values. Finally these obtained papers are organized, classified, and filed. Also small technical information exhibitions are organized for the research staff.

(3). Submitting for Use

There are many types of methods to submit technical information for use. Following are several examples:

a). Build topical cards or edit catalogues

In order to serve research topics based on large scale index searching, topical index cards can be built, one set of cards for each research topic. These topical cards can be used any time, and can be edited into catalogues to serve the research staff.

b). Edit and print photo brochures.

"Edit" means to make comments, and "print" means to print photographs. In order to serve some special research topics, we always try to obtain a set of photographs of similar type foreign products, if possible. Then these comments and photographs are edited into brochures for reference by related research staff. Usually they are practical and valuable reference sources.

c). Prepare translated reports

Based on the holding of a large quantity of technical information, part of the most valuable information can be chosen for selected translation, edited translation, or full translation. Translation is the main method of our information service. This is especially important in the current situation where the average level of foreign language command is quite limited for the research staff.

In order to enhance the effectiveness of the technical information service, some important translated papers (usually 15-20) should be edited and published as a special

book to serve some special research topic.

d). Offer topical service

Topical service is also an effective method to serve product research. The so-called topical service is to assign a special group of information service staff to trace some special research topic by keeping the technical information search by reporting of the developing directions both abroad and within the country, and searching for related foreign and domestic technical information according to the problems occurring in the process of research and development. Thus the policy of using the foreign things to serve the needs of China is carried out.

5. Several Comments

In order to make good technical information service, not only good command of foreign languages (two or more will be better) is necessary, but a wide spectrum of knowledge and good information service skill are also needed.

A good information service is mainly based on the accumulation of information and knowledge over a long period of time. Although short-term hard work can also solve some problems, the information will not be systematic and lacks accuracy, and it will also lead to a situation of mess and fatigue.

The five points should be enforced for a good technical

information service work, that is: timeliness, correctness, fitness, completeness, and continuouness.

A good technical information service work also depends on the good relationship between technical managers and technical staff.

And good technical information service work also requires that the information service staff must continuously raise their level of speciality, diligently study technology, and improve the command of foreign languages.

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