SAS, A TRULY INTERNATIONAL SOFTWARE PACKAGE?
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ABSTRACT
SAS has become one of the most widely accepted data management and statistical analysis packages in the United States. Furthermore, SAS appears to be in the process of achieving a global acceptance as one of the premier software packages in the world. A recent issue of SAS Communications (Summer, 1982) has listed SAS distributors in many parts of the world. For example, SAS has now over 200 products installed in Japan, a very important market in the global competition. This paper examines how SAS is thriving in Japan, a vastly heterogenous culture where a software package written in English has been accepted as a major tool in an applications package arsenal. There are some formidable obstacles to be overcome between the two cultures. For example, SAS manuals must be translated into Japanese versions to make SAS generally accessible to Japanese users. SAS will have to be modified and enhanced to accommodate the Japanese alphabet and Chinese characters which are integral parts of the Japanese language. Japanese managers can hardly be expected to read routine management reports annotated with English titles without grumbling. This paper focuses upon aspects related to cultural transitions of SAS from the Occident to the Orient.

INTRODUCTION
"Is SAS truly becoming an international software package?" An answer to this question may be in the affirmative, judging from a list of SAS subsidiaries and distributors abroad published in a recent issue of the SAS Communications (Summer, 1982). In the United States, it is certainly true that SAS has become one of the most widely accepted data management and statistical analysis packages. In this paper, however, I will be discussing only the cultural transition of SAS from its birthplace in the United States to a foreign market in Japan from my personal viewpoints as a SAS user, who happens to also be a transplanted Japanese. My basic assumption is that if SAS is successfully imported to a developed country whose native tongue is not English and whose cultural background and environment are drastically different from the Western world, then it has achieved the status of an international premier software package. SAS has achieved a wide range of acceptance in Japan where the Japanese language is just about the remotest thing, linguistically speaking, from English. However, many software products designed strictly for English speaking users have previously made inroads into the Japanese market. These products have included DBMS such as ADABAS, SYSTEM 2000, and INQUIRE, and statistical packages such as BMDP and SPSS. However, since these packages have been, at least initially, imported without any customized modifications to accommodate those poor users, most of whom do not speak English, the Japanese users have always had to struggle with various aspects of these software packages.

How has SAS become popular with the Japanese users in a relatively short time under a culturally heterogenous environment? SAS has now over 200 products installed in Japan (Hara, 1982). At this point it is important to establish some historic perspectives:

1. The Japanese computer manufacturers have recently made such tremendous advances in hardware that they are now able to compete with the de facto industry leader, IBM.
2. In terms of software products, the Japanese manufacturers have lagged behind those in the Western world. The Japanese users have had no alternatives to SAS and its competitors, which are designed for the English speaking users. Now that the Japanese have begun to pour a great deal of resources into software products research and development, it will be very interesting to watch them. They still have a long way to go.
3. The Japanese have historically looked outwards with interest in products manufactured overseas, especially in the United States. Under the Japanese educational system, there is a mandatory requirement for a foreign language starting at the seventh grade. Japanese college students often use text books written in English although it is usually very painful to have to study subjects such as physical chemistry, quantum mechanics, or mathematical statistics using books written in a foreign language. Those whose native language is English will never know how painful it is since English is, in fact, the international language comprising the largest body of scientific knowledge.
4. For these reasons and others, software products written for English speaking users have been very popular in Japan in such areas as data base management systems and statistical packages.
5. Therefore, SAS has faced substantially the same competition in the Japanese market: SPSS and BMDP in statistical packages and EASYTRIEVE in data management and report writing, just to mention a few. The selection of SAS is usually motivated on
Once SAS has been introduced, potential users face rather formidable tasks before they become adequately proficient in use of SAS, even assuming that needs to conduct all processing in a completely English environment would not face these brave people. There has been an example, OMNITAB written at the National Bureau of Standards (Hogben and Peavy, 1977), of an attempt to provide multilingual commands processing in a general statistical package. I have no knowledge of whether this particular package has made any substantial inroads into the Japanese user community. Software products produced in the United States are usually imported to Japan without any customized modifications to meet the users' culturally unique requirements. This itself may not be an insurmountable hurdle, evidenced in an interesting observation by one Japanese expert, Yamadori, (BusinessWeek, 1981): "We developed Japanese COBOL, but the Japanese are still using U.S. COBOL, because the Japanese characters are confusing to use." Educating and training Japanese users present problems in several subject areas which might be taken for granted by users in the United States. Admittedly, the SAS user community in Japan is very young, it is just starting up, and will be overcoming some of the problems to be discussed below as more time passes. As a matter of fact, the SAS users in Japan organized their own SAS User Group International-JAPAN and held the first meeting in 1982 (SUGL-J, 1982).

SAS MANUALS

SAS manuals are the first tools needed in training users. However, they present some problems to the Japanese users in the following areas:

- **Availability**
  - Shipping the manuals printed in the United States to Japan in sufficient quantities by air is a rather expensive undertaking in terms of users' needs. Especially, now that the users' guide for SAS82 has been split into two volumes with the basic manual alone looking very intimidating, it is highly problematical that users will have easy access to much needed SAS documentation. I think that an innovative approach is called for to accommodate the Japanese users. For example, copies of the manuals may be printed locally, as in the case of the Asian editions or International student editions of text books in mathematical statistics from McGraw-Hill and John Wiley & Sons. Something can be said about Gillette's famed strategy of selling razors at a low price and making good profits on razor blades later. Perhaps, the user community in Japan can be expanded rapidly with help of SAS manuals priced at a reasonable level. There is no question that the current prices charged are exorbitant for a Japanese publication although Japanese have an insatiable appetite for goods manufactured abroad.

- **Translation**
  - Translating whole volumes of the SAS manuals does not seem to present a completely satisfactory solution to the problem encountered by the Japanese users. Although the users certainly would welcome Japanese versions of the SAS manuals and, as a matter of fact, prefer to read training materials in their own language, there are some problems worth considering:
    1. SAS has had a major release every three years as can be seen in SAS 76, SAS 79 and SAS 82 with frequent minor releases in between. By the time a major publication such as the basic manual for SAS 82, is translated into Japanese and prepared for publication, the useful life may be rather short.
    2. Translated versions of English materials often are awkward and clumsy, although they may be correct. Even considering that the SAS manuals are surely not of great classical literature and technically correct contents may be all that is required for all practical purposes, high quality translations could be very hard to attain.

- **Some Solutions**
  - The problems discussed concerning the availability of the SAS manuals to the Japanese users, in summary, call for solutions in the following two directions:
    1. Local printing of the SAS manuals.
    2. Publishing of customized manuals in Japanese. Proliferation of the SAS manuals to cover a wide range of subject areas and adaptation to different systems probably make translations of whole volumes of these publications undesirable in terms of both expense and time lag involved.

USER SUPPORT

The user community in the United States now appears blessed with a fairly large number of advanced users who would constitute a healthy core for user support groups at various sites. Furthermore, a consultant staff at the SAS Institute is only a phone call away and a user can expect a return call providing a solution to his problem within a reasonable amount of time. However, if a SAS user in Japan has a problem and needs to get in touch
with the SAS consultants in the United States, the SAS Institute is an overseas call away. He can hardly expect to get a return call unless it is a collect call, without even thinking about difficulties with having to communicate in English and the inconvenience caused by the time zone differences (the time in Japan is 14 hours ahead of EST). There is a critical need for a SAS consulting group locally available to the Japanese users. As the users become more sophisticated and want to get more out of SAS to the extent that they would want to install their own procedures and functions, it would become necessary to have a locally available consulting staff who can support SAS users at such a level as procedure writing.

TECHNICAL REFERENCES ON SUBJECT MATTERS

SAS, of course, provides various procedures for a wide range of statistical techniques. SAS demands a lot in the sense that, it assumes, those using these procedures are either fairly conversant in mathematical statistics or have appropriate help readily available. The references listed for the individual procedures are indicative of knowledge required on the subject matters. They are naturally either text books or journal articles published in English. For the SAS users in the United States, these references are readily available in someone’s private collection or at a local university library. However, it would be much harder for a SAS user in Japan to obtain these references. Building an adequate technical library, even on a modest scale would be an extremely expensive and time-consuming undertaking in Japan.

ACCOMMODATIONS AND MODIFICATIONS REQUIRED BY THE JAPANESE USERS

Modifications required for the Japanese SAS users amount to providing means to handle information expressed in Japanese. The modern Japanese language requires many sets of characters: two types of the Japanese alphabet (Hiragana and Katakana) and the Chinese characters (Kanji) accompanied by special symbols equivalent to a comma, period, etc., in addition to a full set of the ANSI characters. This complexity is due to the fact that a written text in modern Japanese might be liberally sprinkled with English phrases, especially, in the case of technical and business documents. The number of Chinese characters which “a well-educated Japanese” is supposed to know used to number tens of thousands. Nowadays usage of the Chinese characters in every day publications such as newspapers and weekly magazines is limited to a little over two thousand. Any software product imported and introduced to the Japanese users must take this unique requirement into consideration if it is to survive in the market place and achieve a long-lasting acceptance among the Japanese users. The SAS Institute is addressing itself to this problem as evidenced in an announcement for SAS/GRAPH 82 on the three Japanese fonts, two types of the Japanese alphabet and a set of the Chinese characters (SAS Communications, 1982). Any keyboard device designed to input the Chinese characters with multiple sets of symbols would have to be equipped with over two thousand slots or keys. An interesting example, a Japanese language word processor, is illustrated in Uttal (1982).

An adaptation of SAS to the Japanese users community needs to be discussed in the following three areas:

- preprocessing
- postprocessing
- customized enhancements

Preprocessing basically covers methods to transfer character data in Japanese to SAS in an acceptable format such as hex characters, whereas postprocessing is concerned with handling outputs for the Japanese character data from SAS through compatible output devices to express text with mixtures of both English and Japanese symbols. Since, for all practical purposes, English is used for programming and command processing in Japan today, handling of Japanese character data in SAS applications involves either English or hex character strings equivalent to the Japanese phrases. In such an environment, SAS merely accepts the Japanese character data prepared through preprocessing devices, processes it routinely through DATA steps and outputs it to postprocessing devices and other programs for further processing. Such a processing mode presents a very serious inconvenience, if not a flaw; it requires a specific set of input and output devices without device independence. Furthermore, interactive processing is almost impossible; trying to list or edit hex character strings directly is not either very pleasant or productive in interactive SAS sessions.

These observations indicate the need to have customized enhancements such as procedures, functions, and formats specifically designed towards the Japanese users. For example, needs exist for functions to operate on the Japanese character strings directly and formats to display or print the Japanese phrases directly in a device independent mode. There also exists a need for an adequately large dictionary of the Chinese characters to be associated with SAS as in the case of the map coordinates files for SAS/GRAPH. The set of some two thousand characters designated for every day use does not include a large number of geographical
names or personal names, for the former had been in existence long before the set was selected and the latter frequently include unusual or rarely used characters due to the fact that Japanese parents often go out of the way in search of unique names for their offspring. For this reason, such a dictionary will have to contain a number of Chinese characters considerably larger than two thousand. Moreover, a file containing the dictionary must be organized in some ingenious way to facilitate an efficient table look-up. It would be best for the SAS Institute to take the initiative and offer these enhancements to the Japanese users for the obvious reason that, but for availability of these extra features, they will undertake their own efforts to install private procedures and functions or look elsewhere. The inclusion of those Japanese fonts in SAS/GRAPH 82 indicates that the SAS Institute is taking a positive step to respond to the Japanese users' needs.

CONCLUDING REMARKS

I have discussed the problems which the Japanese users face in becoming SAS users, and the potential solutions and directions which SAS will have to take to solidify and improve its initial acceptance in Japan. Noting that most of the goods, hard and soft, imported from this nation to Japan are rarely designed or modified specifically for the Japanese users, I think that a SAS capable of handling the Japanese characters in a general way may reach far to bridge the cultural gaps existing between the Occident and the Orient. Let me note that beyond Japan there exists a large region including China, and the financial centers in Hong Kong and Singapore where SAS would have excellent opportunities to make a stronger impact, once equipped with capabilities to process the Chinese characters.

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