

This is a preliminary report by Vu Van Thai and Le Van Kim completed early Fall, 1957 prior to the undertaking of the more intensive report now in translation. However, it will serve to provide some of the assumptions underlying the planning for the computer.

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"Original in French translated under the supervision of Newton B. KNOX, Statistical Advisor, USOM/Vietnam = Bureau of the Census, who takes no responsibility for the contents".

P L A N  
F O R T H E U T I L I Z A T I O N  
O F  
A N  
E L E C T R O N I C C O M P U T E R

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GENERAL OFFICE OF BUDGET  
AND FOREIGN AID

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## I. AIM AND OBJECTIVES OF THE PROJECT

The present plan aims to give the Vietnamese Government the necessary means to introduce an effective automation into the work methods of the various financial, accounting and statistical services of the Government.

In its first phase the introduction of this automation would aim at the three following principal objectives:

- A. The improvement of the system of budgetary control and its extension to all secondary budgets.
- B. The improvement of the system of tax assessment and collection and the increase in the income of the State and the assurance of a greater equity in civic contribution and social charges.
- C. The immediate availability to the Government of information concerning growth of production, the movement of important categories of goods, the state of national inventories, etc., so as to permit a rapid adaptation of economic policy to the real condition of the country.
- D. The attainment of these objectives implies the undertaking by an organization to which adequate resources have been assigned of the following tasks:
  1. Centralization of all governmental accounting, so as to report in the shortest time:
    - a. The condition at any given time of each budgetary account, with regard to the National Budget as well as the provincial and autonomous budgets.
    - b. The cash balance of the totality of public funds, and of revolving funds and autonomous funds.This centralization of accounting will lead to a systemization of the control of public funds.

When the performance budgeting system is put into effect, the control of expenditures should be effected inside of each program.
  2. Control by means of cross-checking of reports of transactions; establishment of complete direct tax lists; control of the collection of taxes.
  3. Management of the national inventories of the principal categories of domestic and imported products, by means of information gathered at the time of each transfer from one to another of the economic sectors.

This reporting will aid in speedy decisions in the economic and financial domain (for instance aid to some branches of production, consumption taxes, etc...) or in commerce (policy governing the allotment of import licenses, for instance).
  4. Establishment of statistics covering production, imports, exports, consumption.

## II. JUSTIFICATION OF THE PROJECT

### A. Importance of the proposed objectives.

#### 1. Necessity for an improved management of governmental accounts.

It is impossible, at the present moment, to find out exactly how the resources of the State are employed.

The control of expenditure, in broad totals is almost non-existent because of a shortage of technical personnel. The condition of each account during the course of the year, is even less likely to be known to anybody. An historical and summary outline of budget implementation is available only four or five months after the end of the fiscal year.

Under these conditions, the Government is deprived of all means of control of its expenditure policy. No forecasts or planning are possible during the fiscal year. Deficits or surpluses which may occur in the course of the year cannot be detected and corrected. Over expenditures cannot be checked, either within an Article or a Chapter of the Budget.

The introduction of an electrical accounting system, with punched cards, made this year, will soon lead to a tangible improvement in the control of the implementation of the National Budget.

However, the problem of the control of peripheral budgets will remain to be solved. Moreover, the control should be pushed down to the individual expenditures themselves. Similarly the system of reporting of expenditures should be developed so as to allow a perfect mastery of the implementation of the future performance budgets.

A well managed budget, avoiding the waste of the State resources and providing greater economics in expenditures, will allow the Government to bring speedier development to the country.

#### 2. Necessity of an improvement in the system of tax assessment and collection.

The major part of the internal resources of the State, comes at present from indirect taxes. The explanation lies in the fact that the basis of these taxes may be ascertained more easily and that their collection is relatively easy. But the total amount of these taxes has already reached a generally admitted ceiling. To increase the internal resources of the State by means of raising excise taxes, and especially the production tax, not only would increase the essential inequity of these taxes, but, more important, would present a danger of deflation in the present period of development of the national economy. The ratio of direct taxes to indirect taxes is 10,82% while it is 110,30 in the United Kingdom, 116,43 in Western Germany, 201,77 in the United States (even in India, an underdeveloped country, it is 50,7%).

In theory, a way to increase the resources of the State already exists, in the form of direct taxes: i.e. Income Tax, Tax on Commercial Profits, etc.,...It would be enough to improve the assessment and collection system of these taxes, and particularly of the Tax on Commercial Profits.

For the year 1955, the total resources derived from the Tax on Commercial and Industrial Profits amounted to 400 million piasters while the net income of the distribution branch has been estimated at 10 billion piasters. The percentage of collection relative to the taxable total comes thus to 4% while the mean taxation rate is 20%.



## II. JUSTIFICATION OF THE PROJECT - continued.

An increase of the internal resources of the State would permit a diminution in resources derived from American Aid. If this increase were to be used to counteract budget deficits, American Aid could be entirely allotted to its natural purpose: investment in capital and other equipment.

### 3. Necessity for management of national inventories.

At present, the nation's inventories consist principally of imported products. The importing process is far from flexible. To the long delays of the present procedure is added the distance from exporting countries. Under these conditions only an exact forecast of the requirements and fluctuations of the inventories would permit an even feeding of the market, which should adapt itself to the levels of internal consumption. This exact adjustment will stop the effects of speculation on inventory levels, and bring about a steadiness in prices.

Another aspect of the normalization of inventory levels will be to make available, for productive investment, capital presently frozen in speculative operations. This new orientation of commercial speculative capital toward healthy investment will be the easier inasmuch as a climate of confidence will have been created with regard to currency by means of the stabilizing action on prices of the proper management of inventories.

Finally, the regulation of inventories will bring about a decrease of the income of the tertiary sector. The consequence will be a decrease in domestic prices which are at present burdened by prohibitive distribution costs. As a result, exports will be facilitated and encouraged. In other words through the management of inventories, we may expect to diminish the share of national income now derived from trade to a more reasonable level; at present 24% of the national income. (Estimate of 1955) against 23.5% for agriculture, which, however, constitutes the main productive activity of the country.

## B. Justification of the use of an electronic computer or electronic data processing machine.

The operations described above can be undertaken, because of their complexity and of their volume, only by an electronic computer.

### 1. Importance of Automation.

The development of backward countries is conditioned, by, amongst other factors, the improvement of their administrative systems. In fact, their rate of growth depends on the quality of the plans for economic development both in the planning itself of the programs and in their execution. And the planning of programs requires a perfect command of all available data on the economy, and their implementation requires that the changes in these initial elements caused by the execution of these same programs be accurately perceived.

These conditions should normally require an efficient administrative organization, well supplied with technical personnel. And it is clear that this requirement cannot be satisfied in a country like Vietnam where it is impossible to hope to train, in a relatively short lapse of time, the technicians which should be allotted to the Administration to enable it to reach a high degree of efficiency.

## II. JUSTIFICATION OF THE PROJECT - continued.

- B. 1. No doubt inspite of everything, there could be found, a small core of more highly trained technicians, but there appears to be no way to train rapidly the few thousand middle level technicians required.  
Recourse to automation is thus the only way to by-pass this shortage, and the only way to progress toward an improvement of the Administration.  
Automation, in fact, permits a saving in middle level technicians, as its ideal realm of application is precisely in routine.
2. Superiority of electronic computers to conventional punched card machines for the introduction of Automation.

The tasks mentioned at the beginning of this project have the following essential characteristics:

- a. The management of card files of very numerous accounts (budgetary accounts, cash accounts, taxable merchants accounts, inventory accounts).
- b. Entries in series.
- c. Multiple confrontations for purposes of cross-checking.
- d. Statistical operations, calculation of averages, percentages and coefficients, computed from numerous basic data.

An estimate of the figures of past years leads one to think, that the volume of this work will be very great.

BUDGET: Considering each paragraph of the Budget as an autonomous account, it is evident that there should be a card file of about 8,000 accounts.

We may anticipate around 700,000 transactions a year for the Central Budget and as many for the peripheral budgets. Each transaction will bring about an immediate change the balances of the budgetary account concerned.

DIRECT TAXES: There are at the present time 26,000 licensed merchants in Saigon-Cholon. The reports of transactions of each of these merchants should be recorded each month and compared with the corresponding reports of purchase of their customers or sellers as the case may be. The number of basic transactions to be reported in this fashion has not yet been determined.

Furthermore, the tenure of real estate should be recorded and its changes followed for about 450,000 farmers (after the agrarian reform), if an increase of income from direct taxation by means of a progressive rural land tax, as recommended by Professor Lindhom, is to be obtained.

INVENTORIES OF MERCHANDISE: An account should be opened for each of the products imported into Vietnam. These products include cotton cloth, black and white calico, flour, sugar, milk, cement, paper, pharmaceutical products, some mechanical and electrical products, etc... and total around a hundred in number.

Accounts could also be opened for each of the major categories defined in the present Code of Customs (about 1,100). However, for this purpose adequate coding personnel must be found.

The products entered in the accounts will be entered "in" at the time of their passage through Customs and "out" on their sale to a nontrader.

The complexity of the operations and their volume thus required from the automation equipment, ability to synthesize, great flexibility and high speeds.

## II. JUSTIFICATION OF THE PROJECT - continued

B. 2. The electronic data processing machine fulfills these conditions better than the conventional punched cards machines. In fact:

- a. The electronic data processing machine with a magnetic tape memory, permits much more intricate operations than conventional machines, as it increases considerably the elements of quite different nature available, to the completion of an operation. The same file may, for instance, contain magnetically recorded a quantity of information much greater than included in the 80 columns of the conventional punched card, and this, occupying a much smaller volume.

Synthesis, by means of processing and the confrontation of a great number of elements, thus fits perfectly the capabilities of an electronic data processing machine.

On the other hand, an electronic data processing machine treats the elements successively, from the input of raw data to the output of finished results while the conventional machines operate in bulk on all the elements together, taking apart each elementary operation into a chain of standard operations. Electronic data processing machine thus proves itself infinitely more flexible inasmuch, as, for each case individually treated, it can take into account the specific conditions and that sub-projects can be recorded in advance inside the general programs. As it is, it is to be feared that the conventional machines are not flexible enough to adapt themselves to the multiple specific cases that even a complete reform of the system will let survive.

- b. We have seen that the problems stated above are characterized by a large volume of individual data. The results expected from their processing are of interest only in so far as, on one hand, they are available immediately, and, on the other hand, they should not be subject to error and should not require checking, involving a loss of time. The results are, above all, primary requisites of effective management and of planning.

The success of economic and fiscal programs that we have recommended above depends on the speed in obtaining these results.

And the working speed of the electronic data processing machine is particularly well adapted to the securing of results likely to be used in problems of management. The speed with which it may effect computation and tabulation permits electronic data processing machine to resolve many statistical problems in one fifth of the time required by conventional machines. In fact, the great capacity of electronic data processing machine memories obviates the numerous preparatory operations of sorting and classification required in the operation of conventional machines. On the other hand the use, in electronic data processing machines, of magnetic tapes leads to a considerable increase in speed of reading and recording.

According to figures given by manufacturer, it takes, for one conventional unit of punched cards, 3 hours to read a file of 25,000 accounts, while 15 minutes will be enough for the reading of that same file recorded on magnetic tape.

The speed element is justified by the fact, already mentioned, that electronic data processing machine is able to solve several problems simultaneously in the course of the same run of the cards. For instance, for purposes of supervision of budgetary execution, one run of reading of the transaction cards should be enough for the electronic data processing machine to establish, on one side, all the accounting reports



## II. JUSTIFICATION OF THE PROJECT - continued

(statement of balances, expenditures and obligations reconciliations, etc...) on the other side all the entries of obligations, expenditures, etc...) lastly, all abnormal cases (rejected expenditures, exhausted allotments, etc...)

### c. A paying proposition.

Most of the advantages of the project cannot be set down into figures, but are of such a nature that each, in itself, amply justifies the cost of the project.

Thus, the complete control of the National Budget and secondary budgets should make for a saving and greater efficiency of public expenditures (on a total volume of 14 billion VNĐ a year for the National Budget and of 1 billion for secondary budgets.)

If the Budget Administration should be reinforced (supposing that technical personnel could be found); to take care imperfectly with present equipment of the task that could be assigned to the machine, it is estimated that the annual budget of this Office should be trebled (at present 48,000,000 VNĐ)

The increase should then be  $48,000,000 \times 2 = 96$  million piasters, or 4 times the cost of the machine.

As regards the collection of taxes, let us remember that, for the tax on commercial profits alone, the increase in collections might be estimated at a minimum of 500 million piasters a year (25 times the cost of the machine).

(Total of taxes on commercial and industrial profits collected at present: 400,000,000 VNĐ - Tax rate: 16% on profits of persons - 24% on corporation profits - Total income of the Commercial Branch: 10 billion piasters).

The management of inventories should permit a tangible decrease in the losses caused by to temporary over supply of certain imported perishable commodities: sugar, cement, antibiotics, flour, etc... Without making an estimate, let us recall simply that the yearly quantity of imported goods amounts to 9 billion piasters a year of which 25% are more or less perishable.

This management of inventories should even permit a program of feeding the market perfectly adjusted to the sales possibilities of the moment, which would reduce the period of non-productivity of capital invested in these inventories.

### Comparison between the advantages of punched card system and electronic data processing machine.

To operate a conventional business machine system one should have available:

(1) 3 conventional sets of machines for recording the execution of the budgets (1,400,000 cards a year, management of 8,000 accounts for the National Budget management of 40 budgets for the provinces).

(2) 3 sets of machines for cash accounts: (1,200,000 cards a year).

(3) 3 sets of machines for the administration and recording of taxes.

(4) 5 sets for the control of inventories and for various other statistical programs.

Or a total of 14 conventional sets of machines.

The cost of 14 conventional sets is certainly higher than that of an electronic computer, of the capacity of the one anticipated for the present project.



The comparison of costs of operation is also quite favorable to the use of electronic data processing machine as shown in the following table:

	:Punch card machine	E.D.P.M.
Punch cards	:3 per item (average):	1 per item
	: (1)	:
Operating personnel	: 42	: 5
Punchers	: 32	: 32
Supervisors	: 4	: 1

The above table does not take into account accounting and administrative personnel, indispensable for the synthesis of data, for the synchronization of tasks, for the checking of data, which would still be necessary for semi-automation undertaken punched card machine.

Lastly, the principal agreement in favor of a total automation by means of an electronic machine as against semi automation by punched card machines, is that the implementation of the system based on punched card machines implies the parallel re-organization of all administrative units concerned into units individually well organized and collectively well coordinated. If this re-organization should lag the general synthesis of the results of each unit cannot operate correctly. On the contrary, a total automation undertaken with an electronic machine works independently of the administrative units concerned from simple elements, and gives to each unit the general elements that will be used to guide its decisions.

(a) This figure takes into account the fact that, outside the card for "in" movement, other cards must be punched for new situation of accounts.

To summarize, the foregoing considerations show that the present project of automation by electronic machine represents a highly profitable new experience which may bring the administrative system of Vietnam to a degree of efficiency unknown to this day in under-developed countries.

The small size of the country (11 million inhabitants) and its economic structure permit a speedy implementation of such a system.

In conclusion, we shall take the liberty to quote a few lines out of the study of Mr. Wurmser, Honorary General Inspector of the Institute of Statistics and Economic Studies ("International Review of Administrative Science" - Vol. 23 - 1957 - No. 1) concerning the importance of automation by electronic assemblies in public administration.

"The enormous recording capacity and the possibility of speedy work of these electronic machines will revolutionize the present methods of office work. We should notice - for this is essential - that when these machines are used, the possibilities for work are such that, usually, beside the planned results, unforeseen information may be obtained or new ways of administrative procedure may be indicated."

### III. DESCRIPTION OF THE PROJECT

#### A. Summary of the project.

##### 1. Data to be put into the electronic data processing machine.

a. All financial transactions effected by any governmental organization at any place, a copy of which will be forwarded to the Center. We give as examples the issuance of bonds, the payment of bonds issued, the collection of moneys, for whatever reason (taxes, fines, etc...) appropriations, issue of vouchers to be paid, payment of vouchers, advances for various purposes, revolving funds, transfers, all administrative expenditures in general (systems of invoice-vouchers and administrative payrolls)

b. The monthly reports of sales of businesses and industries, classified by non-consumer customer, and the totals of retail sales. The reports of taxable purchases by businesses and traders, industries, classified by supplier. The same reports classified by product.

The forms for these reports might be designed according to the ideas proposed by Professor Lindholm, expert of U.S.O.M. 1, in his "Analysis of Vietnam's tax system" - (U.S.O.M. 1956 - Part V, Section V - 3p. 29)

c. Information from National Importation Committee (import & export licenses awarded according to importer's name) and from Customs (declaration of entry by category of goods).

##### 2. Work done by electronic data processing machine.

a. Daily operations. Recording daily transactions and keeping the budget current and cash accounts up to date. Only abnormal cases are selected out by the machine for decision by responsible officials.

b. Periodic operations during the months: State of the National inventories of imported products and the bringing up to date of each inventory account. The abnormal inventory accounts will be automatically reported by the machine.

##### c. Monthly and quarterly operations:

(1) Statement of budget execution and of the state of the cast treasury for the whole of the country.

(2) Checking, comparison and cross-checking of reports of sales and purchases.

(3) Discrepancies will be submitted to tax inspectors for investigation.

(4) Statements of uncollected taxes.

(5) Supervision and check on exercise taxes.

(6) Statistics of imports, exports, consumption and inventories.

III. DESCRIPTION OF THE PROJECT - continued

A. d. Annual operations.

- (1) Establishment of rolls for all direct taxes.
- (2) Statistical check of administrative purchases.

All budgetary and treasury cash accounts, inventory accounts, tax payers' accounts, will be recorded permanently on magnetic tapes.

B. Conditions for undertaking the project.

1. Preliminary study to determine exactly the specifications of the necessary electronic data processing machine. This study will be based on a functional study determining, as closely as possible, the volume of the operations to be undertaken.

2. The conclusions of this preliminary study will justify the purchase of an electronic data processing machine. A definitive study of utilization will then be undertaken jointly with the engineer of the manufacturer. This study will determine the basic documents to be used to collect the data, specify the chains of operations and assemble the training programs of electronic data processing machine. This study could last a year.

3. The preliminary operations which we estimate a last six months, will be undertaken still in cooperation with the manufacturer of the machine.

4. Technical assistance.

a. One expert on the operation of electronic machines. Mission: Advise the personnel of the General Office of Budget in the preliminary study, the definitive study and preliminary operations (duration: 1 year)

b. One engineer of the manufacturing company, for making the final study and the preliminary operation ( one year and half).

c. One expert in organization and procedures for the determination of the feed-in of data (6 months).

5. Training of Vietnamese Personnel.

2 programmers (year abroad, 6 months training on the spot with the manufacturer's engineer)

1 mechanical engineer (training on the spot with the manufacturer's engineer)

1 electronics engineer for maintenance and troubleshooting (training with the manufacturer's for a year)

32 punchers and verifiers, to train on the spot.

Clerks, accounting and administrative personnel are already in existence.



#### IV. COSTS OF THE PROJECT.

According to information received to this day, it may be estimated that the price of an electronic computer, complete with magnetic tape memories comes to \$600,000 US.

For the capacity of memory contemplated at the beginning, one should count on about \$500,000 US.

##### Estimates of Expenditures:

##### Expenditures in US dollars:

1 electronic computer with magnetic tape memory	\$500,000.
1 air conditioner (with dust remover)	7,000.

##### Technical assistance:

1 expert (12 months)	\$20,000.
1 expert (6 months)	6,000.
3 scholarships (1 year)	16,800.
1 expert (18 months) from the manufacturer	

##### Expenditure in piasters: (to be charged to the National Budget)

Construction of buildings and Installation hand and buildings:	2,000,000\$VN
Installation	to be included in the contract with the manufacturer

##### Operational expenditure:

Power	per year - 18,000\$VN
Cards and supplies	1,000,000

##### Technical personnel:

2 programmers technicians	480,000 VN\$ per year
1 Maintenance engineer	180,000
1 Operator	120,000
1 Mechanic	100,000
1 Chief of service	240,000
32 Punchers	1,536,000
10 Coders	432,000

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TOTAL..... 3,088,000 VN\$ per year

IV. COSTS OF THE PROJECT.- continued

Estimates of Expenditures:- continued

Expenditure in piasters: (to be charged to the National Budget)

Overhead:

Water, power	120,000 VNĐ
Labor	1,400,000
Maintenance of buildings	50,000
Amortization of machine in 10 years	1,750,000
	<hr/>
	3,320,000 VNĐ per year

V. ORGANIZATION OF THE PROJECT:

The organization and the administrative management of the project will come under the General Office of Budget and Foreign Aid.

The management of the program "Budgetary Control" will be under the same organization.

The management of the "Taxes" program will be under the General Bureau of Taxes.

The management of the program "Inventories and Statistics" will be undertaken by the "Institute of Statistics."

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A P P E N D I X - 1

Components of the electronic computer required.

1. Unit of computation and logic.
2. Power unit.
3. Feed-in and feed-out of cards.
4. Printing unit.
5. Ferrite memory unit.
6. Magnetic tape memory units with synchronizing unit.

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A P P E N D I X - 2

1. Control of Budget: A program derived from the appended organization chart could be drawn up rapidly.

APPENDIX - 2 - continued

1. Control of Budget - continued

(Notice of I.B.M. Co. - Form 29-1202-0/8-5: 5 M-W)

"LOCAL GOVERNMENT FUND AND APPROPRIATION ACCOUNTING"

"The principle here illustrated presumes a daily flow of accounting transactions with instantaneous acknowledgement when transactions are rejected. Thus, immediate audit and availability of funds is accomplished. The flexibility of electronic data processing machine with choices of directly printed output, punched card output, or a combination of both, provides a variety of format to meet almost any requirement.

This illustration presumes that, in addition to the daily routine processing, statements will also be produced on a chosen accounting cycle as well as reconciliation of encumbrance and expenditures."

NOTE: The following diagram concerns an electronic data processing machine with magnetic disc memory device, but may be applied with some variations to an electronic data processing machine with magnetic tape memories.

2. Taxes: An application in this matter is in its preliminary operation phase on an electronic machine at Algiers. The documentation should get here any time now.

3. Management of inventories: An adaptation of the numerous programs of inventory management as applied to chain stores could be easily undertaken.



Receiving notice  
Purchase Order  
Requisition

Fund income or  
Disbursement  
Allotment

Source  
Documents

Requisition

