

November 6, 1961

1401 Tabular Programming System

Evaluation Program

The 1401 RAMAC Tabular Programming System is being developed in order to provide a framework for experimentation in the use of Decision Tables for programming applications. There are many that think Decision Tables will provide the basis for the next generation of programming and systems describing languages. But, it is felt that experimentation using these techniques should be completed before IBM is committed in this direction. At least one of our competitors has already announced a tabular programming system and others may not be far behind. Also, the Development Group of CODASYL has been progressing in this direction; should not IBM as a leader in the industry become knowledgeable in this area in order to exert that leadership?

Some Goals of the 1401 Tabular Programming Project

- o To develop a rigorous and consistent tabular form system suitable for machine implementation. Thus, providing a framework for experimentation, using Decision Tables for programming applications.
- o To determine whether a tabular form language and processor would be useful on a wide scale. If this need exists, IBM will want to take leadership in further development work and in providing customers with these programming aids.
- o To gain experience in the design and production of compilers for Decision Tables.
- o To gather evidence of the usefulness of tables by both experienced and inexperienced user installations.
- o To develop a library of sample tables solving real user problems.
- o To document the areas where Decision Tables are better than conventional means and where they are not.

Selection of Experimenters

In order to perform an effective evaluation, it will be desirable to have experimenters from different industries, and also data processing groups with varying degrees of experience and sophistication. It is

hoped that the regional co-ordinators will provide a diversity of industry and of applications.

Hopefully, there will be two or three customer installations in each region experimenting with the system between now and the end of January.

Agreement should be reached with the branch office which services the particular account in order that their objectives are not hindered by the experiment. Likewise, since this is an experimental system, the experiment should not be conducted in order to gain some sales advantage in a shaky account or in a competitive situation.

When possible, the experimenting customers should be within reasonable distance in order to facilitate communication and traveling problems. The customer should also be one that is willing to join us in an experiment without any guarantee that he will develop useful and efficient programs as a result of his effort. They should expect to spend two or three months in this experiment, and hopefully, will supply a couple of people on a more or less full-time basis. They should also be aware, and agree to the fact, that IBM does not promise to maintain this system in the future or guarantee that there will not be errors in the processor. There is also no guarantee that this system will ever be an official product of IBM; of course, they will be able to continue using the processor at the conclusion of the experiment if they so desire.

Advantages to the Customer

- o In utilizing the 1401 Tabular Programming System, the customer will develop some useful programs for his installation. The applications to be used in this experiment should be real customer problems, not illustrative or sample problems.
- o The customer will get free machine time to compile and debug his programs.
- o The customer will learn some of the newest techniques in the field of application programming. Also, he may influence the future languages and processors produced by IBM, thus insuring that any 1401 Tabular Programming System released by Applied Programming will be of such a sophistication that he can solve his application problems, since any areas of weakness will, if possible, be remedied by IBM.

- o Even if the customer does not have a RAMAC for his installation he might fruitfully experiment with the system in order to develop the logic for his programs in a convenient form. He can also check out that logic on machine, and then take this logic and express it in Autocoder or any other language suitable for the particular machine combination at his installation.
- o He will get professional consulting help from IBM when needed to solve particularly difficult problems.

The Evaluation Process

1. Locate and contact customers. The regional co-ordinators will select candidate customers based on the machine order book (1401 - 1405) and those which have shown an interest in tabular techniques.

The co-ordinators will have available in making calls on customers this evaluation plan outline, the Datamation article developing the Decision Table concept, and a twenty-five minute film strip describing tables and indicating some application areas.

2. Teaching the 1401 Tabular Programming System. The initial two-day course was conducted in Endicott on October 17th and 18th by Mr. W. L. Kelly, Manager of Education Planning and Mr. T. B. Glans, Systems Engineering Services. The course consisted of an introduction to some of the concepts and applications of Decision Tables, the 1401 TP System in detail, and participation by the class in developing 1401 programs on a workshop basis. This class was attended by 19 people; representing customer accounts, internal IBM installations, Education, GP Applied Programming, Systems Engineering Services, and others interested in current developments utilizing Decision Tables.

The Systems Engineers representing 1401 - 1405 RAMAC accounts then return to the participating customer's office to instruct them in the use of the system. The preliminary manual is used to assist in teaching the customer, and to provide a reference document to answer particular questions that arise at a later date.

Customers that indicate a desire to participate in the evaluation program from now on will be taught the system, but individual arrangements will have to be made. This instruction will be given by Systems Engineers that attended the Endicott course, Systems Engineering Services, as regional education specialists.

General Products Applied Programming will provide instruction in the use of the 1401 TP compiler. A workshop is planned in November at Endicott to demonstrate all aspects of compiling, debugging, and running of programs utilizing the 1401 Tabular Programming System. It is hoped that either the Systems Engineer on each customer account or a specialist from each region will attend this session. All testing that can be accomplished at Endicott will be conducted by GP Applied Programming.

3. Selection of Applications. It will be the responsibility of the regional co-ordinators to insure that some breath of application is covered in the different programming efforts in order to provide a broader base for making the evaluation. These applications should be real jobs that are going to be tackled by the customer and not fabricated work problems. Since the speed and efficiency of the processor is not the main item of the evaluation, it is suggested that one-time jobs might be the basis for some applications. At this stage, the object programs are not expected to be very efficient; thus, for long-running jobs where high operation speed is required, it is suggested that normal programming methods be used.
4. Technical Assistance. While the customers are preparing their programs, the Systems Engineers should be available to assist them in developing their programs or answer questions as they arise. This does not mean spending full time with them. Problems that cannot be solved at the local level should be referred back to the regional co-ordinator or to Systems Engineering Services. If necessary, a member of Systems Engineering Services will make himself available at the customer's home office.
5. Compiling and Debugging Programs. Compiling and debugging will generally take place on IBM owned machines either at the Endicott Glendale Laboratory or at the various Datacenters in the regions. If customers wish to use their own machines, they will use them at their own expense. An experienced IBM

man should always be available to conduct the compiling and debugging sessions. Training in the use of the compiler is discussed in Item 2 above.

6. Evaluation Criteria. It should be stressed that the main emphasis in the evaluation program is upon the use of decision tables for analysis, coding, etc. Although we are interested in the efficiency of the processor, this is of secondary concern. The processor has been constructed in order that extremely large programs can be written in the 1401 TP System, i. e., 25, 50 or even 100,000 instructions. However, because of the flexibility provided in this direction, the execution efficiency on relatively small programs, i. e., less than core size, will in all likelihood be quite slow in comparison to the same program written by conventional programming means. But, as noted above, we are trying to evaluate decision tables as a means of programming, rather than in terms of efficiency obtained in the object program.

Statistics on the following items will be necessary in order to prepare the final evaluation report:

1. Program Analysis Time
2. Program Writing Time
3. Compiling Time
4. Elapsed Time for Debugging
 - Number of Debugging Runs
 - Errors in Source Tables
 - Errors in Object Tables
5. Effectiveness as a Program Communication Device

In order that future processors will be more efficient, it will be useful to get figures on typical tables sizes. Also, the frequency of using limited entry tables only, compared to extended entry tables only might be significant.

7. Report. The last step in the process is the preparation of the evaluation report. This will be the responsibility of Systems Engineering Services, GP Applied Programming, and GP Marketing. The input to this report will be the statistics received from the various experimental stations.

The information in this report can be used freely by any one of the three evaluating groups. In addition to the consolidated

report, any group may, of course, make other evaluations based on the particular criteria that interests them. It is hoped that the final report will be prepared by February, 1962.

The following are, in broad outline, the responsibilities of the various groups and individuals participating in the 1401 Tabular Programming Evaluation Study:

DP Systems Engineering Services

Maintain and provide copies of the 1401 Tabular Programming Manual.

Arrange classes for new groups joining the Evaluation Program.

Coordinate the various phases of the Evaluation Program.

Provide assistance in preparing the final report.

Provide application consulting when required.

DP Education Planning

Assist in teaching 1401 Tabular Programming to new groups.

Provide aids for teaching, such as foils, outlines and sample problems.

GP Applied Programming

Provide and maintain a working processor.

Provide instructions to users in the operation of the system.

Secure 1401 machine time in Endicott or at Regional Datacenters.

Document the processor.

Assist in preparing a final evaluation report.

GP Marketing

Specify evaluation criteria pertinent to marketing.

Assist in preparation of evaluation report.

Sponsor TP experiments at locations marketing feels is desirable.

Assist in coordinating the evaluation program.

Regional Coordinators

Determine possible test locations.

Contact and sign up customers for evaluation.

Be contact point for systems engineer on regional accounts.

Provide a diversity of applications and a diversity of user sophistication.

Insure that test locations are keeping records for input into the evaluation report.

Provide Systems Engineering Services with intermediate test results.

Call attention to any difficulties in the region (technical or political).

Gather evaluation material as it becomes available and summarize for final report.

Visit test locations when possible.

Insure that customer locations have all materials needed.

Thoroughly understand the 1401 Tabular Programming system.

Systems Engineer, Customer Accounts

Teach the system to customers.

Assist the customer in getting started in preparing applications programs.

Provide consulting help to the customer as he develops programs.

Keep the regional coordinators informed of progress.

Make requests for compiling and debugging time through the regional coordinators.

Request technical assistance when required.

Assist customers at test sessions.

Insure that the participating customer is keeping proper statistics on the various criteria specified.

It is currently estimated that the Evaluation Program will continue to the end of January, 1962, to be followed immediately by the preparation of the final evaluation report. As indicated earlier, it is hoped that there will be at least two or three studies in each of the regions; FSD should also sponsor studies.

Anyone locating additional customers that wish to experiment should contact their regional coordinator to make preliminary arrangements.

Any other problems that arise that cannot be solved at the local level should be directed to Systems Engineering Services.

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