

COMPANY CONFIDENTIAL

MEETING OR CONTACT REPORT

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	Reported By: Dr. H. G. Kolsky
Project: (10) 7000-X Committee-- Investigation of IDP	Department: 749
	Follow-up Date:

PERSONNEL PARTICIPATING:
(Place asterisk next to those on
distribution list. Other distribu-
tion show at end of report)

G. A. Blaauw*
S. G. Campbell*
K. W. Kaeli*
H. G. Kolsky * ←

I. Subject:

Mr. Kaeli described some of the findings of the IDP Study Committee of which he was a member. The committee, under the chairmanship of first Mr. P. K. Spatz and later Mr. G. V. Hawkins, made a very detailed study of data gathering, computer requirements, and new computer design for integrated data processing. (Reference is made to the reports of this committee, dated August 1958.)

II. Computers Studied for IDP.

In the study, the following computers were considered:

1. 305
2. 310 as originally proposed by San Jose
3. 650-RAMAC
4. 705
5. 7070
6. Junior STRETCH

The 305, 650-Ramac, and San Jose 310 were considered as having only limited integrated data processing application because of restrictions in

1. Internal speed
2. Size of working memory
3. Number of data channels (one only)

The 705, 7070, and STRETCH were capable of true integrated processing (as contrasted to in-line processing.) STRETCH was the best equipped, the 705 the least.

III. Control Problems Encountered in IDP.

The following control problems must be faced in an IDP system.

1. Cueing of processing in the system as a result of
 - (a) multiple input-output requests
 - (b) multiple references to given file
 - (c) multiple request for use of working storage in memory
 - (d) multiple requests for program storage
2. Multiprogramming - Because there is an imbalance between I/O rates and processing rates, multiprogramming is proposed to give the effect of having several slower computers instead on one fast one. Multiprogramming results in certain logical difficulties, which must be solved in one way or another, for example:
 - (a) Simultaneous Record Reference, in which one program is changing a record which another program is using.
 - (b) "Dead-lock" situations which occur when one tries to avoid the above problem by denying references to records being used by other programs.
3. Priority Control - Being able to handle the following cases.
 - (a) Urgent requests and deferred requests for processing
 - (b) Load fluctuations both
 - (1) cyclic - predictable
 - (2) non-cyclic - unpredictable

IV. Desirable Features for an IDP Computer

Multiprogramming places the largest demand on a computer. The following features would be helpful:

1. An interrupt procedure which saves the status of machine.
2. Record control word I/O -- indexing, scatter read/write with resetting.
3. Memory protection features.
4. Relative addressing to facilitate relocation of programs.

V. General Conclusions

1. The economic advantages of IDP are not known as yet. Commercial customers are wary. Only military customers are willing to spend money.
2. IDP will come by an evolutionary process rather than revolution. Data gathering on-line for later batch processing is probably the starting point. (e.g. Boeing project)
3. The terminal equipment, keyboards, etc., are very expensive -- perhaps half the system cost.
4. It is not clear at present that large computers have a place in IDP, perhaps multiple small machines such as 310's may be the way to do it, the answer depends on the amount of processing speed needed.

Harwood H. Kolsky

H. G. Kolsky
Product Planning Representative
Project 7000

HGK:pf

cc: Mr. D. W. Sweeney
Dr. W. Buccholz