ORD-2227-65

11 August 1965

MEMORANDUM FOR: Director of Research and Development

SUBJECT: ORD Intelligence Sciences Laboratory
Facilities for Analysis Division Program

1. We attach a summary of the principal elements of the proposed Analysis Division/ORD program which we have discussed in the last few weeks. We urge the adoption of the general plan of this program and the consideration of increased funding for FY66.

2. A new and important aspect of our program is concerned with the implementation of the analysis portion of an ORD Intelligence Sciences Laboratory to be set up in Headquarters Building. The tasks to be carried out by means of this facility, funding and manpower requirements, and additional background information are summarized in the attached material.
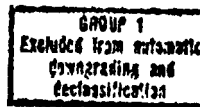
3. We suggest that the Analysis Division program, which has been in process of formulation for the past year, is a pertinent and important element to be included in a possible Agency response to questions raised by the recent PFIAB memorandum and studies of the NPIC operations.
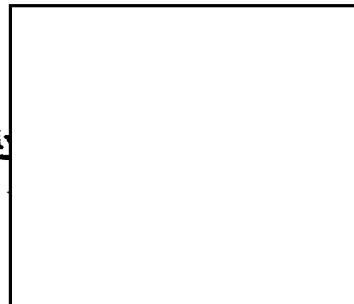
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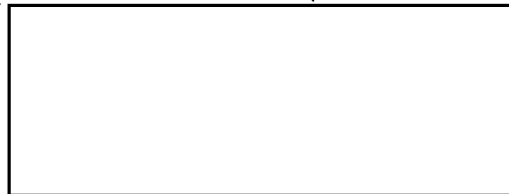
Chief, Analysis
ORD/DD/S&T

Attachment:
An/ORD Summary Program

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Analysis Division/ORD

<u>General Summary of Program Objecti</u>

I. OPERATIONS AND SYSTEMS RESEARCH

<u>Program Objectives</u>:

To describe and update an integrated model of the overall intelligence process for purposes of management control and R&D planning.

To determine by a continuing study, the impact on the intelligence process of new advances in technology; e.g., mass memories, time-shared computers, multiple terminals, new recording, input, and display methods, new automated recognition methods, etc.

To design new intelligence processes and systems by the application of predictive analysis methods, statistical decision theory, mathematical modeling and operations analysis techniques.

II. RESEARCH AND DEVELOPMENT ON MAN-MACHINE PROCESSES

<u>Program Objectives</u>:

To design, develop and show feasibility of processes and equipment for support of human intelligence processing, interpretation, and production from textual, speech, graphic and waveform input data by application of available time-shared computer technology involving specialized remote terminals and displays.

III. RESEARCH AND DEVELOPMENT ON LANGUAGE AND TEXT PROCESSES

<u>Program Objectives</u>:

To design, develop, and show feasibility of processes and equipment for improved collection, interpretation, and

production operations concerned with textual and
language data. The R&D program shall include work
on the following:

> Textual Input and Transcription Processes
> Representation and Indexing Processes
> File Organization - Search - and Retrieval Processes
> Automated Formatting, Summation, and Reporting
> Logical Analysis and Automated Inference
> Automated Classification
> Machine-Aided Translation
> Machine Translation

IV. RESEARCH AND DEVELOPMENT ON SPEECH PROCESSES

Program Objectives:

> To design, develop, and show feasibility of processes and
> equipment for optimization of intelligibility of speech
> records, and for implementation of an audio pre-
> processing system with capabilities for automated
> phoneme, work and speaker recognition.

> To design, develop, and show feasibility for operational use
> of a speech recognizer and phonetic typewriter for the
> continuous input of speech into data-processing systems.

V. RESEARCH AND DEVELOPMENT ON PATTERN RECOGNITION

Program Objectives:

> To design, develop, and show feasibility for operational use
> of pattern recognition processes and equipment for
> intelligence interpretation and production operations.
> The R&D program shall include work on:

> > Facial Recognition Processes
> > Handwriting Recognition Processes
> > Analyst Character and Line-Reading Pencil
> > Pattern Recognition Processes for Graphic Data
> > > (Photo, _____)
> > Recognition and Signature Determination Processes
> > > for Waveform Data
> > Universal-font Character Recognizer

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VI. RESEARCH AND DEVELOPMENT ON AUTOMATA, SELF-ORGANIZING AND ADAPTIVE PROCESSES

Program Objectives:

To design, develop, and show operational feasibility of
processes and equipment which can sense, operate on
and use intelligence data in remote and unaccessible
locations and which function as automata, self-organizing
processors, or processors which adapt to environment
or to incoming sensory data.

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Intelligence Sciences Laboratory - Analysis Program

SPECIFIC TASK AREAS

Laboratory facilities under this program are required
for the development, testing, and evaluation of man-machine
procedures, equipment, and subsystems in the following areas: .

I.   Documentary Analysis - Intelligence Production:

Processes which exploit the potential of on-line keyboards,
displays, text analyzers, text recognizers, formatting, and
editing routines, are to be developed and integrated to provide
machine aids for the intelligence analyst.

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II. Photo[   ]Interpretation:

Processes using computer-controlled graphic scanners at
various levels of resolution, keyboards, input tablets with
scriber input and control, mensuration equipment, visual, video,
and CRT displays, are to be developed further and integrated
into on-line operational subsystems for interpretation of photo,

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[   ]

III. Speech Processing:

Processes using converters, dynamic filtering, CRT displays,
spectrum displays, voice control, audio output, pattern recog-
nition processes, pitch tracking analysis, are to be developed
and integrated into on-line operational subsystems for enhancing
the intelligibility of speech in audio records, for optimizing
speech signals in noisy records, for automated recognition
methods for words, phonemes and speakers.

IV. Indexing, Search and Retrieval:

Processes using on-line keyboards, CRT displays, automated
dictionary files, automated syntactic analyzers and parsers,

recent developments in logical representation, file organization, and search strategy are to be developed and integrated into an on-line indexing, search and retrieval subsystem for documentary intelligence data.

V. Text Processing:

Processes using keyboards, CRT displays, input tablets, and printers are to be developed and integrated into on-line subsystems for editing, formatting, correcting, composing, and report generating from textual input data.

VI. Signal Processing and Correlation:

Processes using converters, signal correlators, comparators, keyboards, CRT displays, transient and delay analyzers, sensor inputs, computer-controlled cameras, recorders, signal and pattern recognizers are to be further developed and integrated into an on-line subsystem for reduction, analysis, and interpretation of waveform and multisensor data.

VII. Pattern Recognition:

Processes using data input devices, keyboards, input tablets, computer-controlled scanners, converters, correlators, visual, video and CRT displays, pre-normalization, property classification and discriminant analysis methods, are to be further developed and integrated into subsystems for automated and human-monitored subsystems for recognition and interpretation of patterns of interest in graphic and waveform intelligence data.

ORD/DD/S&T
Intelligence Sciences Laboratory - Analysis Program

Program Emphasis:

Emphasis is on exploitation of newly available computer
technology with remote terminals, program-controlled
devices and time-shared processors for intelligence
analysis and interpretation.

Emphasis is on design and further development of basic man-
machine functions in order to provide essential design
and planning data for full systems implementation. Basic
functions will be integrated into operational subsystems,
tested, and demonstrated in order to show feasibility for
application in Agency operations.

Why Action on this Program is Urgently Recommended Now:

1. New developments in man-machine technology can provide
better tools to deal with the difficult problem of increased
intelligence collection and limited man-power resources.

2. Major changes will be made in intelligence operations
because of the inpact of man-machine technology. Steps
should be taken to lead in this period to the greatest extent
possible.

3. There is danger that large systems applications will be
attempted before the basic processes required in these
systems have been sufficiently developed. This can be
extremely costly and may actually impede desired progress.

4. There should be an adequate base of technical know-how
and experience within the Agency in order to provide guidance
for management and planning in a very complex and costly
change-over period.

5. The intelligence community has specialized requirements which are not being taken care of by developments for the military and for business applications. The Agency should take a lead in initiating appropriate R&D for its specialized needs and it should maintain a position in this area.

6. Recently certain scientific advisory groups, including the Communications Panel for the PFIAB, have urged that more positive action be taken in the man-machine area in the intelligence community. Studies of the NPIC operation urge action in the same direction. The program proposed for the Analysis Division/ORD has been formulated over the past year. The program demonstrates that the Agency has been resourceful and active in this important area; however, expansion and implementation of the program should now be carried forward.

ORD/DD/S&T
Intelligence Sciences Laboratory
Analysis Program

Facilities:

The following types of computer on-line devices and
terminals are to be developed, improved, or evaluated in the
analysis program:

> typewriters, keyboards, control consoles
> CRT displays with light pen input and control
> computer-controlled cameras, recorders, and video
>   displays
> computer voice-controlled units and audio outputs
> computer-controlled graphic scanners
> input tablets with scriber input and control
> printers, plotters
> acoustic dynamic filtering equipment
> signal correlators, signal comparators
> spectrum display equipment
> A-D and D-A converters
> signal recognizers and transient analyzers
> various sensors and transducers
> pattern recognition and signature determination equipment
> character recognition equipment
> manual character reader unit
> dynamic and static wall display equipment for graphic
>   and alphanumeric data

Central processor facilities will be provided with capacity to
drive terminals and devices under development and with sufficient
memory to permit testing and evaluation of experimental pre-operational
systems.

Relation to OCS Facilities:

It will be a policy in the planning and implementation of this
facility to establish linkages with the OCS facilities where this is
feasible and desirable. Available OCS services are to be used
particularly for input keying and processing of data and for programming
tasks of common interest.

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ORD/DD/S&T
Intelligence Sciences Laboratory
Analysis Program

Action Schedule FY66

August 1965   Install Teleprinter terminal in An/ORD, Headquarters
Building, in order to carry out querying, searching,
retrieval, analysis and programming experiments
with remote time-shared centers (e.g., ⬚⬚⬚⬚)   25X1
⬚⬚⬚⬚⬚⬚⬚⬚⬚   25X1
etc.).

**September
1965**   Install terminal in An/ORD to link with ⬚⬚⬚⬚   25X1
⬚⬚ systems for evaluation and experimentation
concerned with the search and retrieval of highly
structured and formatted intelligence data.

**October
1965**   Initiate projects with ⬚⬚⬚⬚⬚   25X1
concerned with development of on-line processes for
text processing, search and retrieval. Install console
linked with time-shared system at ⬚⬚⬚⬚   25X1
New York.

**November
1965**   Complete study of specifications for processor and
essential terminals and computer-controlled devices
for analysis program for the ORD Intelligence Sciences
Laboratory.

Spring 1966   Install processor and on-line terminal equipment in
ORD, Intelligence Sciences Laboratory at Headquarters
Building.

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		ROUTING	DATE SENT
TO	DD/S&T		
FROM	D/ORD		
SUBJ. The Automation of Intelligence Processing			
O&1 - addressee			
1 - D/ORD			
1 - DD/ORD			
1 - C/An/ORD			
1 - C/O/ORD			
1 - ORD Reg			

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