UNITED STATES GOVERNMENT

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2-Way Memo

Subject: FY 1985 R&D Planning Cycle

INSTRUCTIONS

Use routing symbols whenever possible.

SENDER (*Originator of message*):
Use brief, informal language.
Conserve space.
Forward original and one copy.

RECEIVER (*Replier to message*):
Reply below the message, keep one copy, return one copy.

To: [redacted] C/ED/P/ODP

DATE OF MESSAGE	ROUTING SYMBOL
9 Dec 1982	25X1

SIGNATURE OF ORIGINATOR [redacted] 25X1

TITLE OF ORIGINATOR C/P&PG/MS

FOLD

INITIAL MESSAGE

Dave:

Attached you will find S&T's responses to a subset of DDA R&D 1985 problems.* Interested in your evaluation of relevance, responsiveness, quality etc. Need input by COB 14 Dec. If you have questions, go to ORD contact on specifics. If you want to see other responses, see me.

Thanks. [redacted]

* DDA 3, 12, 21, 31 25X1

REPLY MESSAGE

#3 — Good topic - poor response - Computer Laboratory — Poor Idea -

#10 - Poor Topic — Very Bad Idea -

#21 - OK — — OK - We even put in 25K —

#31 — Good Topic - OK to Poor.

From [redacted]

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DATE OF REPLY	ROUTING SYMBOL
	25X1

SIGNATURE OF REPLIER

TITLE OF REPLIER

OPTIONAL FORM 27 (Rev. 7-77)

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25X1

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9

INFORMATION SYSTEMS PROGRAM

COMPUTER LABORATORY FACILITY

ORD/PATG/ISRD/ [redacted] 25X1

REQUIREMENT: The volume of intelligence data that must be handled by the Agency is ever increasing. There is a continuing need for an information system program which is focused on enhancing the Agency's information system capabilities. Such a program should address areas of information processing, analysis, dissemination, and other application enhancement areas, such as text search, content analysis, or automatic image analysis. Also, this program includes research and development efforts in the areas of computer hardware and software, electronics, electro-optics, device technology, data communications, system architecture, and other areas of information system technology. Such a program would be the basis for providing the Agency with a continuous state-of-the-art information handling capability.

Source: DDI-LR15, DDA-002, DDA-003, DDA-005, DDA-013, DDA-014, DDA-016, DDA-021, DDA-023, DDA-024

CUSTOMER/SCENARIO:

User: DDI, DDA, DDS&T Components
Customer: DDI, DDA, DDS&T
Scenario: The computer laboratory would function as the primary facility for Agency information system research efforts. The laboratory would be directed by ORD and provide the equipment and personnel necessary to support Agency information system research requirements.

DESCRIPTION: The laboratory would be located at a contractor maintained facility. The computer laboratory facility contractor would supply the equipment, personnel, and management/support functions necessary to maintain the computer laboratory. The contractor personnel would include lab technicians as well as maintenance, security, and support personnel.

The initial equipment structure of the laboratory would be two distributed computer systems/networks. One of these distributed systems would be an operational system. The other, an experimental hardware testbed.

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INFORMATION SYSTEMS PROGRAM

COMPUTER LABORATORY FACILITY

DESCRIPTION: (Continued)

The operational system would host experiments in the high-level (software) areas. This would include research efforts in the areas of operating system design, performance analysis, data base management systems, languages, communication (high-level) protocols, data processing applications, etc.

The hardware testbed system would be used to conduct experiments in the areas of computer hardware, device technology, fiber optics, electro-optics, communication (low-level) protocols, memory-mass storage device technology, secure design methods, etc.

The initial cost impact of establishing such a facility will be greatly reduced by the resultant decreased per project cost for most information system research efforts. Many ongoing maintenance costs could be absorbed by the contractor, who would have use of the lab facility for their own research programs.

FUNDING

82	83	84	85	86	87	88	89
			1500	200	200	200	

SYSTEM JUSTIFICATION: A computer laboratory would permit ORD to eliminate significant time and cost from research programs. Technology transfer from initial prototype to full operational capability can be greatly facilitated. ORD would be in a unique position to take almost immediate advantage of promising technological areas.

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PROBLEM NUMBER DDA-21 Rank _____ of _____

Office: ODP PRINCIPAL OFFICE: ORD

Title: Computer System Configuration Analysis

Problem Description:

ODP systems engineering personnel are required to evaluate candidate computer systems configurations to determine cost-effective approaches to satisfying system requirements and to improve system performance (i.e., system tuning). Techniques currently available include engineering judgment, benchmarking, analytic modeling, simulation, etc. The configurations in question are extremely complex and involve large IBM or IBM-compatible mainframes and peripheral equipment, primarily disks, such as the IBM 3380. The operating systems involved are IBM/MVS or VM. Time and resource constraints require that modeling tools, in lieu of benchmarking, be emphasized. Such tools should be able to predict key system performance parameters; e.g. response time, turnaround time, maximum number of concurrent users, throughput, etc. Emphasis should be placed on the VM timesharing system, since that is a current performance bottleneck area.

Key requirements for modeling tools are that they be accurate, require only limited data collection and be easy-to-use. Analytic methods would be preferred to simulation methods due to their parsimonious use of computer resources and the relative rapidity with which one can analyze multiple configurations. Existing approaches are believed not adequate for computer systems and configurations of practical interest to ODP.

Time Requirement: Continuing Problem

Background/R&D History/References

ODP Engineering Division is continually exploring available techniques in the commercial and academic world. ORD has begun a study effort with the University of Maryland in this area.

Benefits/Description of Output

Benefits are:

a. Potential cost avoidance associated with use of optimal minimum configurations to meet requirements.

b. Potential performance improvements associated with use of optimal configurations resulting in improvement of user productivity and more timely satisfaction of user requirements.

c. Savings in ODP analysis resources for systems configuration and tuning.

Objectives are:

a. Development of validated computer based models for the configuration analysis of complex large scale IBM or IBM compatible computer systems. Emphasis should be on analytic models and VM-based systems.

b. Implementation of the above models on Agency computer systems; documentation and training should also be provided.

Policy Basis/Justification:

ODP has the responsibility for maintaining a state-of-the-art cost-effective computer facility for use by Agency components. (Reference: [redacted] STAT

Contact: Name [redacted] STAT
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INFORMATION SYSTEMS PROGRAM

COMPUTER LABORATORY FACILITY

ORD/PATG/ISRD [redacted] 25X1

REQUIREMENT: The volume of intelligence data that must be handled by the Agency is ever increasing. There is a continuing need for an information system program which is focused on enhancing the Agency's information system capabilities. Such a program should address areas of information processing, analysis, dissemination, and other application enhancement areas, such as text search, content analysis, or automatic image analysis. Also, this program includes research and development efforts in the areas of computer hardware and software, electronics, electro-optics, device technology, data communications, system architecture, and other areas of information system technology. Such a program would be the basis for providing the Agency with a continuous state-of-the-art information handling capability.

Source: DDI-LR15, DDA-002, DDA-003, DDA-005, DDA-013, DDA-014, DDA-016, DDA-021, DDA-023, DDA-024

CUSTOMER/SCENARIO:

User: DDI, DDA, DDS&T Components
Customer: DDI, DDA, DDS&T
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INFORMATION SYSTEMS PROGRAM

COMPUTER LABORATORY FACILITY

DESCRIPTION:
(Continued)

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DDA-21 QUEUEING MODEL

ORD/ISRD [redacted] 25X1

REQUIREMENT:

(Develop a tool which will allow systems engineering personnel to evaluate changes to the current system and possible new systems without actually changing the system configuration.) This is being done by developing a general network queuing model which can be applied to modeling computer systems.

CUSTOMER/SCENARIO: SED/ODP/DDA

The customer would use the developed modeling tool to carry out various 'what if' type of analyses to help them plan changes to the current system or to plan the purchase of new computer systems.

DESCRIPTION:

(A queueing network modelling system is being developed by some University of Maryland computer science department members.) This system will run on ODP's current IBM computers. It will allow analytic and simulation methods to be used in the modeling of a computer network. The system will have a high level interface to ease the definition of the model and archiving ability to allow sections of code to be saved once a particular subsystem of a computer has been modeled.

FUNDING	82	83	84	85	86	87	88	89
	50	100	50	100				

SYSTEM JUSTIFICATION

This has been an ongoing effort which has met with good customer acceptance. While not risky in the technical sense, such a system has not been developed commercially in this level of generality to our knowledge.

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Administrative - Internal Use Only

Problem Number DDA-31 Rank ____ of ____

Office: ODP

PRINCIPAL OFFICE: ORD

Title: Mass Storage

Problem Description:

Technological progress in the storing of massive amounts of data continues to be made. For example, optical disk technology being advanced for video recording holds considerable promise for digital storage. ODP currently relies on more traditional mechanisms for data storage, such as magnetic disk and tape. An assessment of new technology in the perspective of Agency computing is needed to determine the effective means for introducing this in our computing environment. Particular emphasis should be made on long term storage (archiving) and the ability to inexpensively store large amounts of infrequently referenced data.

Time Requirement:

As soon as practical.

Background/R&D History/References:

ORD contributed significantly to the Agency's previous efforts at establishing a mass storage facility. Mass storage assessments and archiving capability have been included in the R&D problem statements of the last several years.

Benefits/Description of Output:

ODP customers would benefit from the introduction of a facility which would permit on-line access to greater amounts of data. Special requirements exist for providing a portable means for storing and accessing high volumes of Agency information. A paper outlining the specific application of mass storage technology to the Agency would be the first output from the research effort.

Policy Basis/Justification

ODP has the responsibility for providing state-of-the-art computing facilities to Agency customers. This includes capabilities for data storage.

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INFORMATION SYSTEMS PROGRAM

MASS STORAGE

ORD/APRD/
ORD/ISRD/ [redacted] 25X1

REQUIREMENT: [The Agency's needs continue to grow for storing massive amounts of data of all types. These needs include short-term storage of voluminous communications (e.g., down-link bursts), on-line storage of reference materials (e.g., maps, photographs, biographic data), rapid staging of infrequently used on-line files, and permanent archiving of Agency records.] A cost-effective mechanism or family of mass storage mechanisms needs to be developed.

Source: DDI-LR15, DDA-31

CUSTOMER/SCENARIO: Customer: NPIC, OCR, ODE, ODP, OIS

Scenario: Advanced mass storage technologies such as optical, video, or magnetic disks can be used to store large volumes of digital or analog data. Different technologies with different characteristics (such as erasability, high-bandwidth, reproducibility, susceptibility to changes in the environment) will be more appropriate for one application or another. A family of mass storage mechanisms will provide system designers with a selection of alternatives.

DESCRIPTION: [The planned effort will address developing a family of mass storage capabilities with an assessment of the attributes and costs associated with each.] The research program will build upon current APRD efforts at assessing optical disk component technologies (such as ultraviolet lasers, semiconductor lasers, and jukebox mechanisms) as well as ISRD programs in text processing and data management which are addressing potential uses for optical disks. Studies to assess commercial developments, quantify Agency requirements, and design system architectures will be performed.

FUNDING: (Dollars in Thousands)

82	83	84	85	86	87	88	89
180	0	0	500	500	500	300	200

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INFORMATION SYSTEMS PROGRAM

MASS STORAGE

JUSTIFICATION: Optical disks are being developed commercially for specific uses. ORD action is necessary to steer commercial efforts toward interfacing the technology with general-purpose computers.

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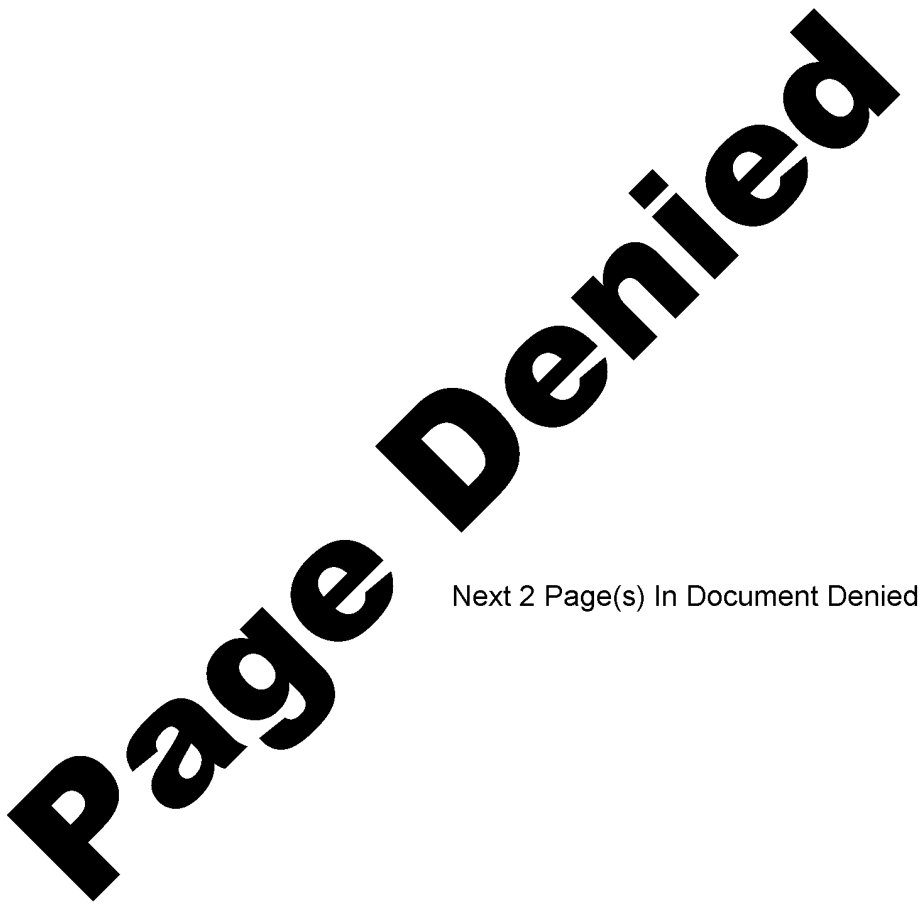

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