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C/PPG

14 September 1982

MEMORANDUM FOR: Acting, Director of Data Processing
Acting, Deputy Director for Applications
Deputy Director for Processing
Chief, Special Projects Staff

FROM: Chief, Management Staff

SUBJECT: FY-85 R&D Planning

1. The FY-85 DDS&T R&D planning exercise has begun and we have been asked to make the initial ODP submissions consisting of prioritized problem statements. They are due in the DDA Management Staff by 1200, 17 September 1982. We apologize for this very short deadline and ask your cooperation. Please provide to ODP Management Staff the following input by COB 16 September: A prioritized list of ODP problem statements (numbered from 1 to n -- high-to-low priority). You may add new problem statements and include them in the priority ranking. Priorities may be indicated directly on the ODP Ranking Sheet (Att. A) which lists last year's submissions. If you wish to delete a problem statement, simply cross it out and exclude it from the ranking. Also attached are last year's problem statements (Att. B). If you wish to add new statements, please follow last year's format and include the new problem statements in the ranking. [redacted] 25X1

2. Please forward the ODP Ranking Sheet and any new or changed problem statements to Management Staff. Management Staff will review new problem statements, consolidate rankings and forward a prioritized list of old and new problem statements to the DDA Management Staff. The DDA Management Staff, through its R&D Panel, develops a ranking of all DDA problem statements. Based on these prioritized problem statements, the DDS&T will develop R&D proposals and forward proposals for final review and ranking to the DDA in late November 1982. [redacted] 25X1

3. Because of the unusually heavy workload in Processing, Management Staff has assumed the R&D coordination role for the office. [redacted], Chief, Policy and Plans Group, will be the action officer. He will represent the office on the DDA R&D Panel and will serve as the point-of-contact with the Office of Research and Development on our R&D program. [redacted] may be [redacted] 25X1 25X1 25X1 25X1 25X1 25X1

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[redacted] when separated from attachment [redacted] 25X1

Att: a/s

cc: EXO
C/AS
C/P&PG
C/P&BG
SO/ODP
C/SPD

Attachment A

ODP Ranking Sheet
Prioritized R&D Problem Statements

Ranking	Problem Statements (Ongoing)
_____	Computer Security
_____	Low-Cost TEMPEST Technology
_____	Database Front-ends to Improve User Accessibility
_____	Distributed Cartographic Database
_____	Mass Storage
_____	User Satisfaction
_____	Management of Large Software Development Contracts
_____	Approaches to Requirements Analysis and Definition

Problem Statements (New)

_____ _____

_____ _____

_____ _____

Component: _____

_____ _____

Component Representative Date

Attachment B

FY 1984 ODP PROBLEM STATEMENTS

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Problem Number _____ Rank____ of 9

Office: ODP

Title: Computer Security

Problem Description:

a. Current and planned systems within ODP produce "audit trails", records of system activity and user access. ORD has been investigating the feasibility of determining inappropriate use of computers by detecting changes in useage patterns as reflected in the audit trails. Techniques of this sort need to be evaluated and refined in a continuing effort, since audit information represents a sound means of assessing damage and possibly detecting misuse.

b. Encryption of data which is randomly accessed and stored is very difficult to do in a dynamic environment. Methods for cheaply and accurately encrypting data which is randomly accessed and stored should be investigated and tested.

c. Methods for filtering textual data in a distributed computer network are required. Data security by system, classification, file status and/or unusual sensitivity should be addressed. The risks of unauthorized access or spillage need to be assessed and probability estimates of secure storage and access for each method should be made.

d. Techniques are desired to improve our ability to detect unauthorized modifications to equipment by uncleared maintenance engineers. The potential for planting firmware or hardware during routine maintenance is high, and the likelihood of detection is low.

Time Requirement:

Need as soon as possible. Research to be conducted on a continuing basis.

Background/R&D History/References:

Computer Security has been a continuing requirement of both the Offices of Data Processing and Security. There are currently ongoing efforts in data filtering and audit trails, and these should be continued.

Benefits/Description of Output:

Objectives are:

a. Identification/detection of unauthorized activities.

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b. Secure random access data storage in potentially hostile environments and for continuity of government.

c. Secure file and data sharing.

The output from this research would be reports, outlining appropriate techniques and algorithms, as well as computer programs and prototype applications.

Policy Basis/Justification:

DCID 1/16

Contact: [redacted] 25X1

Problem Number _____ Rank ____ of 9

Office: ODP

Title: Communication Strategies

Problem Description:

ORD, over several years has provided a very useful foundation for future communications strategies for both the Office of Communications and the Office of Data Processing. A continuing effort is needed to provide further technical assessment of new communications technologies and to address problems associated with new computing and communications environments. Examples of technology which should be assessed include fiber optics, bandwidth compression, image data compression, network analysis, interconnection of wideband networks, availability improvements, and error reduction. The specific trade-offs associated with the Agency's unique security requirements needs to be addressed. Mechanisms for utilizing commercially available communications interfaces (such as ETHERNET BIU's) on the Agency's SAFE bus should be investigated. Also a strategy for providing a large number of low-cost connections to the ODP network is needed.

Time Requirement:

Continuing.

Background/R&D History/Reference:

Submissions from previous years have reflected this requirement. Past activities included studies of bus technology and a communications architecture study.

Benefits/Description of Output:

With the advent of SAFE and overseas connections to the domestic communications resources, the Agency is becoming increasingly dependent upon real-time digital communications. Users of ODP services, especially NFAC and DDO, would be significant beneficiaries of well-formed communication networks. A planning document with specific technological recommendations would be the desired output from the assessment

Policy Basis/Justification:

The Office of Data Processing shares with the Office of Communications a responsibility to produce reliable and responsive telecommunications.

Contact: Name

STAT

Off. Designator/Location SPD/ODP
Telephone (Black)

STAT

Problem Number_____ Rank____ of 9

Office: ODP

Title: Low-Cost TEMPEST Technology

Problem Description:

The requirement to use TEMPEST qualified equipment in most Agency facilities has a major cost and operational impact on ODP and other Agency and Intelligence Community components. TEMPEST requirements are responsible among other things for:

a. Significantly higher ADP equipment costs than those found in civilian organizations. These higher costs are incurred because of required building modifications (i.e., screen rooms), or, as is more common and desirable, the use of TEMPEST-designed equipment or the modification of non-TEMPEST equipment.

b. Generally speaking, even if these extra costs are acceptable the resulting operational problems are major. For example:

1. Time delay, and uncertainties associated with TEMPEST building modifications or equipment modification, or TEMPEST equipment design.

2. Security problems that are associated with current TEMPEST modifications (i.e., requires special TEMPEST maintenance and periodic TEMPEST checking).

3. Physical inconvenience associated with screen rooms (cramped facilities, without windows, having poor ventilation and difficult access).

4. TEMPEST equipment is generally larger and bulkier than its non-TEMPEST counterparts.

5. TEMPEST requirements often narrow and frequently eliminate procurement competition.

6. Because of the impracticalities of screen room modification in existing facilities and the dispersed nature of requirements (e.g., terminals), procurement of TEMPEST-designed or modified equipment is often the only acceptable route. This is often infeasible and results in the Agency being denied the use of certain technology, particularly in the field.

7. More costly and complicated maintenance.

Time Requirement:

Near term.

Background/R&D History/References:

This is a continuing problem area for the Agency.

Benefits/Description of Output:

ODP would derive significant benefit, both cost and operational if low-cost methods for TEMPESTing commercial ADP equipment were readily available. R&D would be designed to explore any and all approaches to the TEMPEST problem. Technical, economic and managerial issues should be explored. For example, TEMPEST market trends, commercial market trends that impact TEMPEST, contractor incentive programs, the feasibility of Community- or Agency-funded TEMPEST research centers, inexpensive TEMPEST testing procedures, etc. are all valid subjects for study. Also technical fixes in screen room technology or electronics packaging might be explored. This initial research would be expected to point in the general direction that demonstrates the biggest TEMPEST payoff rather than attempt to "solve" the TEMPEST problem.

Any R&D activities which would potentially lower costs for TEMPEST ADP equipment would be well worth the investment. The dollar savings, though difficult to estimate would be large. Even more significant would be the increased access to commercially available ADP equipment.

Policy Basis/Justification:

ODP has the responsibility for maintaining a state-of-the-art computer facility for use by Agency components.

Contact: [redacted] STAT

Problem Number_____ Rank____ of 9

Office: ODP

Title: Database Front-ends to Improve User Accessibility

Problem Description:

ODP currently makes use of two database management facilities (RAMIS and GIMS) for almost all applications requiring generalized storage and retrieval of formatted data. There have been several significant developments in the area of human interface to DBMS systems which could potentially improve the useability and accessibility of the database applications. We need to develop an assessment of the new technical advances in this area, as well as the feasibility of applying these techniques to our environment.

Time Requirement:

Continuing problem.

Background/R&D History/References:

This subject has been addressed by previous R&D efforts, but it has not been focused on the existing systems and terminal in ODP.

Benefits/Description of Output:

Data base management is essential to the future of Agency computing and improvements in useability would be beneficial to a wide range of ODP customers. A report describing the potential for application of the techniques would result from the research.

Policy Basis/Justification:

ODP has the responsibility for maintaining a state-of-the-art computer facility for use by Agency components.

Contact: STAT

Problem Number_____ Rank____ of 9

Office: ODP

Title: Distributed Cartographic Database

Problem Description:

Several new ODP systems will require the ability to graphically portray intelligence information superimposed with maps. The characteristic of the communications requirements for these applications is that a relatively high proportion of the information that needs to be sent to graphic terminals is (relatively) static and unclassified cartographic data. These applications would benefit significantly from a mechanism which would allow the geographic data to be stored in the graphics terminal, thus significantly reducing the amount of information which needs to be communicated.

Time Requirement:

Near term.

Background/R&D History/References:

This is a new problem statement. The application of graphics to these applications is currently under development.

Benefits/Description of Output:

A successful and inexpensive implementation would improve our ability to enhance the presentation of geographically-oriented data.

Policy Basis/Justification:

ODP has the responsibility for maintaining a state-of-the-art computer facility for use by Agency components.

Contact: [redacted] STAT

Problem Number _____ Rank ____ of 9

Office: ODP

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.

Contact: [redacted] STAT

Problem Number_____ Rank____ of__9__

Office: ODP

Title: User Satisfaction

Problem Description:

A methodology should be developed such that ODP can more accurately measure the quality of the ADP service it delivers to its Agency and Intelligence Community customers.

Hardware performance measures (e.g., response times, turnaround times, CPU utilization) and availability measures are not by themselves adequate measures of the quality of ADP services. User satisfaction measures are subtle and to-date unquantifiable.

It is envisioned that the literature and outside organizations would be surveyed (e.g., the work of Weinberg and Ethnotech) for methodologies to measure user satisfaction. If existing work were not appropriate for the ODP environment, R&D would be performed to develop new measures and approaches. Some measures might be developed and evaluated with a sample of the ODP customer base.

Time Requirement:

Continuing.

Background/R&D History/References:

This is a new problem statement.

Benefits/Description of Output:

If such measures were available, they could be used to guide ODP managers in resource investment decisions. They could, at least in theory, if used as a management tool, result in better quality of ADP service at the same or less cost. The goal is to develop a methodology such that user satisfaction could be continuously monitored by ODP as part of its overall management.

Policy Basis/Justification:

ODP has the responsibility for maintaining a state-of-the-art computer facility for use by Agency components.

Contact: [redacted] STAT

~~Administrative~~ - Internal Use Only

Problem Number_____ Rank____ of 9

Office: ODP

Title: Management of Large Software Development Contracts

Problem Description:

R&D should be performed which would have as its end result a recommended methodology for the management of large software development contracts. This methodology should be a tool to assist Agency project management offices in delivering software developed under contract, that satisfies Agency requirements and is on time and within cost.

Time Requirement:

Continuing.

Background/R&D History/References:

This is a new problem statement.

Benefits/Description of Output:

The execution of large software development contracts in CIA is becoming increasingly more commonplace (e.g., SAFE, CAMS2, NDP). The successful completion of these projects is imperative. The Agency, like most outside organizations, has had only limited success in this area. Any improvement through the use of standardized management approaches, tools, and training etc, would be of great benefit both in terms of cost and operational impact.

It is envisioned that this R&D project would initially be a review of key Agency software development contract experience, a review of similar outside experience and a survey of available management methodologies. New methodologies would be developed if required.

Policy Basis/Justification:

ODP has the responsibility for maintaining a state-of-the-art computer facility for use by Agency components.

Contact: STAT

~~Administrative~~ - Internal Use Only

Problem Number_____ Rank____ of 9

Office: ODP

Title: Approaches to Requirements Analysis and Definition

Problem Description:

The design and construction of information systems is a complex process, often characterized by misunderstood requirements and expectations, underestimated costs and schedules, and systems which are difficult to change. Progress is being made on several fronts based on increased understanding of the basis for requirements analysis. Some steps of the design process are being codified and languages are being proposed for more precise communications among designers and between designers and requirements analysts.

Time Requirement:

Continuing.

Background/R&D History/References:

This is a new problem statement.

Benefits/Description of Output:

Any advance in training, tools or techniques would improve the productivity of staff and the quality of the software product.

Policy Basis/Justification:

ODP has the responsibility for maintaining a state-of-the-art computer facility for use by Agency components.

Contact: Name _____
Off. Designator/Location ODP
Telephone (Black) [redacted] STAT