# A.I.D. INFORMATION MANAGEMENT

# STRATEGIC PLANNING PROJECT

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# A.I.D. INFORMATION MANAGEMENT STRATEGIC PLANNING PROJECT

## OBJECTIVE

To formulate an Agency-wide information technology (IT) strategic plan with a five year horizon.

## ASSUMPTIONS

The plan will reflect the concerns of all parties with an interest in the issue. The plan will include the IMC agenda, A.I.D. senior management concerns, as well as those of IRM.

The IT strategic plan is not static, but dynamic. That is, it will be updated every year in response to changes in the forces and issues impacting A.I.D.

The work will be performed, under the direction of IRM, by an outside consulting firm which will be selected through full and open competition.

## CONSTRAINTS

Since A.I.D is in transition and lacks, at the present time, a clear strategic business plan, the project will have to assume some business goals as a point of departure. These goals will, of course, be cleared by Management and updated as soon as we have a well defined business plan.

Since we lack a methodology for IT strategic planning, we must allow a certain flexibility to the consulting firm while assuring they meet our needs and satisfy OMB requirements.

## ORGANIZATIONAL IMPACT

For the IT strategic plan to be a useful tool, its formulation must have active cooperation from both senior-level managers and also from mid-level staff, both in AID/W as well as some Missions (about 6).

In addition to the need for a steering committee, such as the IMC, active participation by key line staff who understand the business processes of their respective units is essential.

Parallel to the planning steering committee, the creation of a data committee to guide the formulation of the data architecture is recommended by most planning methodologies.

## BACKGROUND

Within the last years (1988-89) A.I.D. began an earnest reexamination of both its program goals and strategies, as well as its administrative "modus operandi". As a result of this endeavor a radical shift in program philosophy has emerged. The conceptual shift has been manifested in a change from functional input modalities to output/impact objectives, both at the sector level as well as the country/regional level. In addition to this general shift, senior management has determined that a specific need exists to resolve certain problems in present financial information systems, and as a consequence, significantly improve program management systems in order to satisfy OMB requirements.

These forces (when combined with the fact that one of the major vendors we have relied upon as a cornerstone in our present information architecture has found its future in jeopardy) have had a significant impact on the 1988 IRM strategic information plan. The impact has been evident in the negation of some of the premises underlying the plan, as well as key implementation strategies. Furthermore, contemporary issues also affect the plan; the recent PDC study highlights the need to reexamine some management practices, tools, and resources, required to manage information in A.I.D..

Thus, it has become critical that we reformulate a strategic information plan which would serve A.I.D. management as a blueprint in guiding a significant investment in information technology through the 1990's.

## SCOPE OF WORK

In order to respond adequately to the challenge of formulating a strategic IM plan with a five year horizon, and assure an ROI with a five to seven year life span, we propose that a broad based scope of work is essential. This proposal consists of two distinct but essential components. Part I of the plan deals with the resources, management infrastructure and practices, and, tools and methods required to properly manage information/data as a corporate resource. Thus, it has been named "Information Resources Planning".

Part II will prescribe the overall information architecture required to serve those management information needs deemed as <u>essential</u> to the proper planning, control, and operation of A.I.D. programs. It has been entitled "Information/Data Planning". Eventhough several unique methodologies have been promulgated to formulate the information architecture of an enterprise, the proposed outline is general in nature and does not advocate any particular methodology.

Underlying this approach is the premise that both parts, although congruent, can be carried on as parallel tasks. Furthermore, Part I can be sized adequately, since the scope can be well defined. To assist in properly sizing this effort we have provided an outline of those major points to be covered by the study. In addition, we have included in pages 8-20 a detailed list of issues, to which we expect specific and prescriptive answers.

Critical to the usefulness of, and our ability to size Part II, is the degree of resolution expected from a detailed information architecture. Once that a "macro-view" of key subject databases (e.g. budget, personnel, etc.), and associated business processes, functions and organizations are mapped, detailed data models for each of them must be formulated. This process can require a substantial amount of time and resource-consuming effort, which would inevitably impact our ability to formulate a strategic plan by June 1990.

Thus, it is imprerative that parameters be established with respect to the level of detail expected from the data architecture effort. Hence, our suggestion is to focus on one critical business function or process, dependent on one single subject database (this to be determined by the IMC), and develop a detailed data model. This effort would then serve as a method for future applications development systems, and as a path finder.

For the sake of comprehensiveness we have included a section on security. This effort is being undertaken in an independent study by DOD/NSA, and will not be included in the scope of work.

Finally, the strategic plan will serve an essential role as an agent of change. That role is to develop and establish a "lingua franca" (or common language) among all the players (users, management, and IRM) who have a critical interest in formulating a rational strategy for an information architecture which will serve A.I.D. well, throughout this new decade.

Following are: outline of scope of work (pp. 4-6); detailed list of strategic issues grouped by categories (pp. 8-20); and, deliverables and suggested level of effort (pp. 21-22).

# A.I.D. INFORMATION MANAGEMENT STRATEGIC PLAN
# PROPOSED OUTLINE FOR SCOPE OF WORK

## PART I

## Information Resources Planning

1. Identify A.I.D. Goals and Strategies.

   a. Program Goals and Strategies
   b. Administrative Goals and Strategies
      AID/W
      Large Missions (one in each region)
      Small Missions (small sample)
   c. Identify in AID/W Key Sub-Organizations
      Admin. Goals/Strategies

2. Assess Environment.

   a. Internal
      Review IRM Charter
      IRM Capabilities, Skills Assessment
      Current Technology in A.I.D.
      Current Portofolio of Applications
      IG & NSA Recommendations
      Stage of IM Maturity

   b. External
      Assess Information Technology in the 1990's
         Major Vendor's Future
         Where is IT Going?
         (hardware,software,communications)
      Federal IT policies, Guidelines, Strategies
         OMB, GSA, GAO
      Other Agencies
         State, USIA, USDA, Commerce
      Private sector
         Two Multinationals working with LDCs

3. IM Policies/Goals/Strategies.

   a. Organizational
      Institutional Culture
      Organization
      Human Resources
      Security

   b. IT Management Processes
      Methodologies
      Change Management
      Quality Assurance

   c. Technology Focus
      Data
      Office Automation
      Decision Support Systems and Productivity Tools
      Hardware
      Software
      Communications

   d. Resources
      Mapping Strategic Plan to Tactical Plans
      Staffing
      Budgeting within an MBO Management Style

## PART II

## Information/Data Planning

1. Taxonomy of A.I.D.
   - Organization Structure
   - Locations
   - Goals and Strategies of Each Key Sub-Organization Division or Branch?

2. Business Model of A.I.D.
   - Major Activity Areas
   - Business Functions and Sub-Functions
   - Function/Organization Analysis
   - Problems

3. Information Architecture
   - Define Information Requirements
   - Identify Subject Databases
   - Entity Model for Each Subject Database
   - Key Standard Identifier
   - Key Entity Relations
   - Data Distribution (physical)

4. Business Information Model
   - Map Business Function to Data
   - Map Organization to Data
   - Descriptive Business Information Model
   - Prescriptive Business Information Model
   - Suggest any Required Changes to Present Processes

5. Application Systems Architecture
   - Identify Obsolete, Useless Applications
   - Identify Major Modifications/Migrations of Existing Applications
   - New Applications
   - Implications to Hardware/Software/Communications Infrastructure
   - Identify Infrastructure Projects

6. Evaluation of Projects
   - Sequencing of Projects due to Architectural Imperatives
   - Sizing of Projects (cost and time)
   - End User Cost (staffing, training, quipment, mntc.)
   - Cost/Benefit Analysis
   - Multiyear Scheduling
   - Inpact to Organization

7. Management Issues.

# A.I.D. INFORMATION TECHNOLOGY STRATEGIC PLAN

## DETAILED OUTLINE

## PART I, SECTION 3

## INSTITUTIONAL CULTURE

### DRIVING FORCE

A.I.D. senior management has determined that information technology plays a critical role in supporting the planning, implementation and oversight of the Agency's operations. This notion, when combined with the demand of the user community for both accurate and timely information dictates the need for a radical change in the manner in which data and information, in electronic form, is viewed and treated throughout all levels of the organization.

### GOAL

To institutionalize the notion that data is a corporate resource and must be managed as such.

### STRATEGIC ISSUES

# Within the organization as a whole, what are the specific cultural obstacles which act to impede the organizational acceptance of data as a corporate resource?

# What linkages can be either discerned or created between data integrity and timeliness, and an individual's or division's performance in relation to that data?

# How can A.I.D. institutionalize the concept of either personal or divisional "accountability" for data?

# What checks and balances must be implemented in the existing organization if data is to be held as a corporate resource?

# How do we implement data quality control?

# With the advent of electronic mail, FAX and other forms of "paperless" communication, what changes in existing processes must occur to maximize the use of this technology?

# With new channels of communications, how do we treat informal versus formal communications, between individuals and organizations (ie., clearance-level issues)?

## ORGANIZATION

### DRIVING FORCE

Recent changes and shifts in A.I.D. program goals and strategies, combined with rapid changes in the management of information technology, generate the need for greater participation, accountability, and responsibility at all levels of the organization.

### GOAL

To establish organizational structures, information management practices, and controls which would maximize return on information technology (IT) investment and increase user participation.

### STRATEGIC ISSUES

# Could IRM be organized differently in order to optimize available resource utilization and maximize the delivery of services and support? If so, how?

# What should be the division of responsibilities, practical roles and foci of the user community and IRM in AID/W and overseas posts (ie., relating to data, hardware, software, staffing)?

# In an information architecture environment that stresses a certain degree of decentralization, which positions should be directly under IRM headcount, and which ones under bureaus, offices or missions?

# What steps and organizational changes, if any, should the offices, bureaus, and missions take to increase their benefits from information technology?

# What changes in administrative practices must take place?

## HUMAN RESOURCES

### DRIVING FORCE

Demands for expanded and comprehensive services from IRM, when coupled with the inherent general unfamiliarity of new/changing technology, create the need to increase the technical capabilities of I.R.M and core contractor staff.

### GOAL

To attract, train and retain qualified IRM personnel and long-term contractors.

### STRATEGIC ISSUES

# What programs should A.I.D. pursue in order to develop, train, and retain the required qualified personnel and contractors to meet IT requirements?

# What training programs should A.I.D. implement with respect to the general user community both in Washington and overseas?

# How should A.I.D. ensure that core contractors develop and implement the necessary training programs for their personnel assigned to us ?

# What role should IRM and Personnel Management play in training the user in new technologies both in AID/W as well as overseas?

# What skill sets or qualifications are needed to effectively incorporate and manage future technological systems used by A.I.D.?

## SECURITY *

### DRIVING FORCE

A.I.D., in addition to being a development agency, is essentially an instrument of U.S. foreign policy. The principal component of this instrument is financial; policy goals are pursued or attained through financial investment. A tumultuous global environment increases the sensitivity of much of the data about which A.I.D. is primarily concerned.

### GOAL

To ensure the integrity of those processes dedicated to capturing, storing and delivering corporate data, and minimize risks associated with destruction, unauthorized access and normal use of data

### STRATEGIC ISSUES

# What specific risks exist with regard to A.I.D. systems and data in A.I.D./W as well as those overseas?

# What security measures would be best suited to the A.I.D. environment, and would best protect data, systems, and telecommunications?

# How should A.I.D. properly integrate auditability into existing financial systems?

# What changes, if any, should be taken with regard to personnel in order to minimize any risk to systems?

# What disaster recovery procedures and/or plans must be devised to protect systems and data-both in A.I.D./W and overseas-from disasters?

* A separate security study is to be conducted by DOD/NSA.

# METHODOLOGY

## DRIVING FORCE

A need exists to reduce both development and maintenance costs, and the time lag on our applications. In addition, the clarity of documentation on our data recources and key applications is less than optimal. This, combined with the fact that most of our applications are developed by different contracting firms in the absence of any unambiguous standards or methodology, has contributed to a lack of systems integration, and, duplicate and inaccurate data.

## GOAL

To adopt and strictly adhere to a set of methodologies in all phases of the life cycle when planning and developing applications whose domain of information is a subset of the corporate data.

## STRATEGIC ISSUES

# What should be our methodology for strategic planning?

# What should be our methodology for information architecture?

# What should be our methodology for systems develpment?

# To what extend do we use automated tools (e.g. CASE)

# What contracting mechanisms do we use to assure than present as well as future contractors adhere to our methodologies and standards?

# To what extend do we enforce missions to adhere to our methodologies when developping their applications in the field?

# How do we manage pilot applications?

## CHANGE MANAGEMENT

### DRIVING FORCE

A.I.D. finds itself in a critical phase of change, not only from a programmatic point of view, but also in a reexamination of its present information architecture and its information management philosophy.

### GOAL

To effectively manage on-going organizational change.

### STRATEGIC ISSUES

# How do we develop a corp of analysts with a strong service orientation?

# How do we educate management, IRM and the user community on change management ?

# What processes, working groups and organizational techniques should we implement to manage change in IT?

# Changes in IT may require changes in processes outside the IRM domain; how should these be accomplished?

# How do we resolve conflicts?

# How do we manage the development of large application systems whose domain of information crosses organizational boundaries?

# Should we use matrix management as a tool to manage large IT projects? Other management methodologies?

# QUALITY ASSURANCE

## DRIVING FORCE

A demand by the user community for more accurate information and information systems more responsive to their needs has generated a requirement to build strong quality control mechanisms in all future automation activities.

## GOAL

To institutionalize strong quality control measures within IRM processes

## STRATEGIC ISSUES

# Where in the IRM organization should a quality control unit be created? What should be its mission?

# At what points in an applications development life cycle should we build quality controls.

# How do we implement quality controls for data accuracy?

# How do we involve the user community? To what extent do we define its responsibility?

# What mechanisms do we use to ensure that all critical phases in the development life cycle are well documented?

# DATA

## DRIVING FORCE

A.I.D Management requires better, more accurate, and more timely data to properly plan, control, and implement the programs and projects of the Agency.

## GOAL

To create the proper environment for managing data as any other corporate resource.

## STRATEGIC ISSUES

# What should be the domain of corporate data to best serve A.I.D.?

# How do we determine and implement data ownership and data custodianship?

# What methodology do we use to implement the data base approach?

# How do we institutionalize data standards?

# What tools do we use to capture, house and deliver corporate data?

# How do we insure that independent applications do not undermine a rational data architecture?

# What services and support should IRM provide for non-corporate data?

# To what extent do we adjust our existing portofolio of applications to a data base approach?

# How do we balance the need for subject data base with the need for quick implementation of critical applications?

# To what extent do we attempt integration of systems using the data base approach?

# How much of the corporate data can be disseminated to the individual user's computer for use in decisionmaking?

## OFFICE AUTOMATION

DRIVING FORCE

A convergence of external factors (e.g. paper reduction act, federal budget constraints) and internal factors (e.g. increase productivity, reduction of telephone costs) underline the need to increase the use of IT in the area of office automation.

GOAL

Implement electronic mail (EM) and expand the use of desktop publishing, cd-rom technology for non-volatile information (e.g Agency handbooks), FAX, and word processing.

STRATEGIC ISSUES

# What should be the standard word processing package(s)?

# What kind of EM should be implemented in AID/W?

# What other functions associated with EM (e.g. bulletin boards, calendaring, etc.) should be institutionalized in AID/W?

# Should we view and use EM as a formal or informal channel of communications? And, do we implement EM in the Missions?

# Do we allow individuals in our overseas posts to be able to communicate directly to A.I.D./W? via EM?

# Will the U.S. Ambassador or Mission Director allow it?

# With the advent of EM and FAX, what should be the role of the cable?

# What administrative processes do we modify to take advantage of EM and FAX?

# To what extent do we modify the process of clearance, and signature?

# What kind of information should we allow to be stored in electronic media?

# What changes in records management must take place in a paperless bureaucratic culture?

# How do we transform the traditional secretary in a fully automated office?

## DECISION SUPPORT SYSTEMS AND PRODUCTIVITY TOOLS

### DRIVING FORCE

There is a need to increase the productivity of our program and project officers in the field as well as in AID/W. It is imperative that the array of tools and access to information available to the A.I.D. project officer be expanded.

### GOAL

To provide project officers and other professionals in A.I.D. a portofolio of tools, and access to information required to increase their productivity.

### STRATEGIC ISSUES

# What should be the portofolio of productivity tools in any micro: WP? Spreadsheet? Project management? Others? All of the above?

# Should the laptop be an essential tool for every project officer?

# What other tools should we support (e.g. graphics, statistical packages, desktop publishing)?

# How strict should we be in setting software standards? Should we let one-thousand flowers bloom?

# Institutional memory is an essential resource in the planning and implementation of any project or program- How do we facilitate access to it?

# What other external sources of information are essential for many project officers?

# HARDWARE

## DRIVING FORCE

Although present hardware architecture has served A.I.D. well by introducing automation in a complex and geographically dispersed organization-in many instances under less than optimal environment- a reexamination of this architecture is needed. We must ensure that the hardware architecture we elect will both serve the organization through the 1990's and allow A.I.D. to take advantage of new technological advances.

## GOAL

To implement a hardware architecture which not only serves a physically and organizationally decentralized institution well, but in many instances must survive a hostile environment and assure than the ROI spans at least 5 to 7 years.

## STRATEGIC ISSUES

# Is the present three-tier (mainframe, minicomputers, and microcomputers) architecture optimal for the 90's in A.I.D./W?

# Is the present two-tier architecture (minicomputer, and microcomputers) the right one for our large missions?

# If we view the minicomputer as a repository for a subset of the corporate data, can it be replaced by a local area network of micros?

# What should be our strategy on a multivendor environment? Do we simply replace one of the existing ones by another? Or do we allow more than two?

# To what extent do we distance ourselves from the Department of State architecture and future vendors?

# To what extent do we allow the operating system to be the determining selection criteria?

# What framework should we use to determine obsolescence of equipment?

# SOFTWARE

## DRIVING FORCE

The need to manage data as a corporate resource combined with the need to reduce maintenance costs, and hardware vendor dependancy, make the choice of software tools we are using to manage data, develop applications, and in general, maintain the operating systems environment we work with, a critical selection process.

## GOAL

To select and implement a portofolio of software tools, data base management systems, operating systems, programming languages, and system design tools which will maximize productivity and minimize vendor dependence.

## STRATEGIC ISSUES

# Once that a determination is made on which subject data bases will reside on the mainframe and which ones will be distributed, what DBMS should be used to house the corporate data base in the mainframe?

# Which DBMS should be used in the field on both micro and mini-based platforms? Would we be better off with multiple DBMS's?

# Should the DBMS that houses the corporate data be the same one for casual end-users that need to mantain simple files?

# Is MVS the right operating system for the mainframe? If most of the corporate data base in AID/W resides on the mainframe, should we have a user friendly operating system for the end user?

# Is MS/DOS the right operating system for our micros? Should the use of multi-tasking, multi-user operating systems on micros be explored?

# Should we explore using one single operating system that crosses all machines, regardless of size and vendor?

# What programming languages should we use in addition to the DBMS, and COBOL, to implement those applications which feed and maintain our corporate data base?

# What CASE tools should we use?

# If we allow a certain decentralization of applications development, what limits do we impose?

# TELECOMMUNICATIONS

## DRIVING FORCE

The need to reduce time lags in a number of A.I.D. critical processes, combined with the advent of the microcomputer and the concomitant desire to manage data as a corporate resource, has created both a challenge and a window of opportunity to improve organizational telecommunications.

## GOAL

To create a telecommunications infrastructure which will properly and effectively link A.I.D. overseas posts to AID/W, other dispersed locations within AID/W, and open gateways to external sources of information.

## STRATEGIC ISSUES

# What should be the principal domain of telecommunications Data, Voice, Image?

# What of the various critical telecommunication functions and services should A.I.D. have in the 90's?

# To what extent should A.I.D. depend upon the Department o State's data network to link our overseas posts to AID/W?

# To what extent should A.I.D. develop or purchase telecommunication services? What are the alternatives?

# What protocols and network management tools should A.I.D. use for a wide area network linking our locations in AID/W?

# What local area networks should A.I.D. use for inter-building connectivity ?

# How will A.I.D. link a multi-vendor platform?

# To what extent should telecommunications services serve program-funded activities?

**DELIVERABLES**

1. Within 10 working days of initiating work, a detailed outline and work plan must be presented by the selected contractor. The work plan must include resource allocation for all the enumerated tasks, including six (6) TDY's of five working days for three large missions, and three working days for three small missions.

2. Within three (3) months of initiating work, the contractor must be prepared to deliver a first draft of Part I of the Strategic Plan. Within two weeks of receiving comments from IRM and IMC a second draft must be completed. Within two weeks of receiving comments from senior management the final draft shall be due.

3. Contractor project manager must be prepared to deliver bi-weekly progress report, in writing as well as in meetings with project team.

4. Within two (2) months of initiating work, contractor must deliver first draft of section 1,2 and part of 3 of the Information architecture (PART II), including identification of all key subject databases required to support AID/W at the office level.

5. Second draft is due two weeks after receiving comments from IRM, IMC and the Data Committee. At which time a specific subject database will have been identified for detailed entity analysis.

6. Within four (4) months of initiating work a detailed business model and data model, relating to one single subject database, and embracing all processes and functions, regardless of organizational boundaries must be delivered by contractor.

7. Within five (5) months of initiating work contractor must deliver first draft of complete Part II, including sections 5,6 and 7, as outlined in scope of work.

8. In addition, contractor must deliver in machine readable form, all the files produced by the CASE tool used in designing the data models.

9. Three weeks from receiving IRM and and IMC comments final draft of Part II is due.

## SUGGESTED LEVEL OF EFFORT

### A. PART I

A 3-person technical team, composed of one senior management cosultant, a senior information technology consultant, and one senior analyst should be established. The two senior members of the team must have proven experience in formulating strategic information plans in large public sector institutions and/or private multinational enterprise. Duration of effort is estimated to be four months.

### B. PART II

A 4-person technical team, composed of one senior management analyst, one senior data analyst/data modeler, one senior analyst experienced in design of financial systems under a DBMS environment, and one senior analyst with proven experience on the use of CASE tools. The duration of this effort is estimated to be six months

In both cases all clerical, secretarial and logistic support for the effort must be provided by contractor. In the implementation of Part II, however, IRM analysts and user representatives with in-depth knowledge of those specific business functions being modeled will be part of the implementation team.