ASIAN DEVELOPMENT BANK

INFORMATION TECHNOLOGY STRATEGY

AND

CAPITAL EXPENDITURE REQUIREMENTS: 2004–2009

June 2004

ABBREVIATIONS

ADB	–	Asian Development Bank
BPMSD	–	Budget, Personnel and Management Systems Department
COSO	–	Central Operations Services Office
CSP	–	Country Strategy and Programs
DMC	–	developing member country
EBRD	–	European Bank for Reconstruction and Development
E-mail	–	electronic mail
IFC	–	International Finance Corporation
IMF	–	International Monetary Fund
ISTS	–	Information Systems and Technology Strategy (1998–2002)
ISTS II	–	Information Systems and Technology Strategy (2004–2009)
IT	–	information technology
ITC	–	Information Technology Committee
LIBOR	–	London interbank offered rate
LTSF	–	long term strategic framework
MDG	–	Millennium Development Goal
MTS	–	medium term strategy
OIST	–	Office of Information Systems and Technology
RSDD	–	Regional and Sustainable Development Department
SPD	–	Strategic and Policy Department
SWIFT	–	Society for Worldwide Interbank Financial Telecommunications
TA	–	Technical Assistance
TRMS	–	Treasury Risk Management System
UNDP	–	United Nations Development Programme
UPS	–	uninterrupted power supply

GLOSSARY

Business Case	–	Represents a process of analyzing a variety of alternatives for meeting specific needs and determination of the optional solution. The business case compares the cost of the investment with the expected benefits.
Business Ownership	–	Information systems are owned by Departments/Offices responsible for defining and implementing the key business processes for which the information system provides support. "Ownership" implies responsibility for determining the scope, objectives and specific design parameters of an information system as well as responsibility for defining and entering data and content resident in the information system.
Business Sponsor	–	A department/office that plans and carries out an information technology project on behalf of all owners. The business sponsor is a Department/Office responsible for defining and/or implementing the business processes associated with the project.
Enterprise Architecture	–	An integrating framework, that incorporates business strategy, governance, organization and processes; data and information architecture; systems architecture; and information technology architecture.
Enterprise software, portal, data store	–	Enterprise is a term used to define any organization that uses computers. Enterprise software, systems, portals and data stores are used across the various functional units within an enterprise. For example, NotesMail is ADB's enterprise electronic mail system.
Environment	–	A collection of hardware, software network communications and procedures within a computer or group of computers designated for a specific task. In other words, the training environment would hold copies of computer programs and test data specifically for training purposes but would not interact with the production, or "live" computer system operations.
Intranet	–	A network based on internet standards belonging to an organization, usually a corporation, accessible only by the organization's members, employees, or others with appropriate authorization. An intranet's Web sites look and act just like any other Web sites, but a security structure fends off unauthorized access. Intranets are used to share information.
Information Technology Governance	–	A structure of relationships and processes that ensure alignment between information technology and the business objectives, balancing risk and return from information technology investments and operations.

Knowledge Management	–	A concept in which an organization consciously and comprehensively gathers, organizes, shares and analyzes its knowledge in terms of resources, documents and people skills.
Platform	–	In computers, a “platform” is an underlying computer system on which applications can run. It consists of an operating system and the hardware that performs logic operations and manages data movement in the computer. In broader terms, a platform is any base of technologies on which other technologies or processes are built.
Portal	–	A set of technology tools that allows access to information through a personalized web page using a single user name and password from any computer connected to the Internet.
Web	–	Also known as the world wide web, a common interface and supporting protocols within the Internet that allow content providers and users to display data in the form of text, graphics, and sound, all combined to make the information easy to view and use.

CONTENTS

EXECUTIVE SUMMARY

The vision of the Asian Development Bank (ADB) for its information technology (IT) is to provide access to knowledge and information any time, any place, in support of ADB goals. ADB will use IT to improve productivity, efficiency, and effectiveness in its fight against poverty in Asia and the Pacific.

ADB's vision of an Asia and Pacific region free of poverty and the new global agenda on managing for development results and effectiveness provide the context for the Information Systems and Technology Strategy for 2004–2009 (ISTS II). The objectives of the strategy are to provide information systems that support ADB's core business activities, deliver a knowledge management framework, institutionalize the partnership between ADB operations and IT, and develop IT services that are secure and reliable. The following principles were adopted to help ensure that the vision is realized and the objectives met: an internal sponsor will be required for all IT projects, every IT investment will be based on the outcome of a business process review and proper justification, and systems will be developed with due regard to the public communications policy.

The ISTS II was formulated with guidance from the IT Steering Committee, chaired by the vice-president (finance and administration). The IT Committee, a subcommittee of the Knowledge Management Committee, monitored the development of the strategy and determined priorities. A working group with representatives from all departments and offices provided requirements and participated in strategy formulation. The identified business requirements focus on operations, knowledge sharing, and IT governance. Inputs were sought from other stakeholders, including the Board, and incorporated in the paper.

The action plan includes a number of initiatives to implement the strategy, including three major information systems initiatives: (i) knowledge management, (ii) project processing and portfolio management, and (iii) program resource management. The knowledge management information systems include a document repository, a skills knowledge base, and systems for sector and thematic committees and networks. Information systems in the operations area include a project processing management system and a portfolio monitoring and management system that will emphasize reporting on performance. A program resource management system will be developed to link work programs and resources. These initiatives will be implemented within the overall framework of an ADB-wide architecture that will ensure a smooth interface among the various systems.

Technology infrastructure initiatives include improving data networks, consolidating and upgrading servers, and enhancing telecommunications networks. IT governance initiatives call for the establishment of a program office to direct the implementation, address ADB-wide change management issues, and assess the security issues associated with providing increased access to information systems for staff and external stakeholders.

The total cost of the ISTS II is $55 million. The net capital expenditure budget being requested is $49 million, as $1 million was approved as part of the 2004 annual capital budget and $5 million will be funded from the capital budget approved in March 2002 for the loan accounting system. The first part, amounting to $29 million will be available for immediate use, while the use of the remaining $20 million will be subject to management approval after a review of the accomplishments and a reassessment of ADB's business requirements. The cost estimates include provisions for fixed-term professional staff positions, consultants and contractors, procurement of hardware and software, training, and contingencies.

During implementation, the IT Steering Committee will review the progress at least annually, while the IT Committee will meet quarterly to review the progress of implementation, and prioritize activities and projects. Internal sponsors who will take responsibility from a business perspective have been identified for each project. Project committees chaired by the head of the sponsoring departments will be responsible for the effective implementation of the projects. At the working level, project teams will comprise a functional lead from the sponsoring department and a technical lead from the Office of Information Systems and Technology to manage the day-to-day implementation of the projects. The sponsors will ensure that business requirement changes related to new policies or initiatives are incorporated in the systems as soon as the requirements can be formulated. Recommendations from an independent validation and verification program will be considered at each stage and implemented as appropriate during the period.

The lessons of success and failure, both within ADB and in comparator organizations, have been analyzed with the help of external experts. The risks associated with the implementation of the ISTS II have been analyzed and mitigation measures identified. The primary mitigation measure is the implementation of the IT governance initiative, and in particular the establishment of a program management office responsible for monitoring the performance of each project, ensuring sound financial controls, and reporting regularly to the IT Committee and Management on progress and implementation.

The implementation of the strategy will bring major benefits in operational effectiveness, internal efficiency, services to developing member countries and other external stakeholders, and the effective alignment of IT resources with business requirements. The ISTS II will provide collaborative tools to help create, cultivate, and disseminate knowledge across ADB departments and offices and between ADB and its external stakeholders. The data, information, and knowledge will be easily accessible to all. Processes associated with loan procurement and disbursement activities will be enhanced and streamlined to enable the provision of information that is crucial to monitoring and managing for better development results. The document repository will increase the ability of ADB's stakeholders to easily search across the repository and retrieve required documents and relevant information.

A project management system based on a complete project lifecycle will allow systematic management and tracking of ADB projects and enable faster and more effective transformation of accumulated data into quality information for better operating decisions. The program resource management system will improve linkages between strategic objectives, work programs, and resources, which will increase the reliability of planning and management. The new systems will lead to stronger cross-departmental collaboration and will enhance ADB's ability to incorporate lessons learned and experience shared into its assistance programs. Internal efficiency will be maximized to provide more time for staff to analyze data and information. Obtaining relevant documents and information for operations, which currently needs time, energy, and resources, will become more straightforward and intuitive.

ADB needs to build on the accomplishments of the first ISTS and equip itself to face the challenges of moving the poverty reduction agenda forward. The information systems and technology infrastructure must be improved to support the results-based agenda and the knowledge management framework, and to align the systems with the new organizational structure. The ISTS II will take into consideration the trends and opportunities in the IT industry, and is vital to ADB's continued operational efficiency and cost-effectiveness.

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I. INTRODUCTION AND BACKGROUND

1. Work started in 2002 to develop the Information Systems and Technology Strategy for 2004–2009 (ISTS II). The strategy was formulated under the guidance of the Information Technology (IT) Steering Committee, a committee consisting of department heads chaired by the vice-president (finance and administration). The Information Technology Committee (ITC), a subcommittee of the Knowledge Management Committee, monitored the development of the strategy and discussed priorities. Initial requirements were assembled by a working group comprising representatives from all departments and offices. The approach taken to data collection and verification included surveys, interviews, presentations, participatory workshops, and videoconferences. Drafts of the strategy document and costs were reviewed by external consultants and by peers in the World Bank and the International Monetary Fund. Inputs from the Board's Budget Review Committee were sought and incorporated in the preparation of this paper, particularly in the areas of governance, controls, and benefits.

2. The previous information systems and technology strategy (ISTS), for 1998–2002, was supported by an investment program of $29.8 million.[1] The ISTS put in place new information systems, strengthened the technology infrastructure, and improved production and delivery of information materials. A midterm review was presented to the Board in May 2001.[2] The review provided the status of all projects and indicated areas where adjustments were made to the strategy to accommodate new ADB policies and technology changes. The implementation of the ISTS will be completed in 2004 and its original objectives have generally been achieved, except in the project processing and portfolio management area.

3. Core financial and human resource management systems were implemented through the INTEGRA project. The electronic funds system was upgraded to increase integrity and security and a treasury risk management system (TRMS) will be operating in 2004 to provide ADB with improved analytical capability to efficiently measure risk positions. Small-scale document repository systems were implemented to allow electronic access to Board documents, project papers, and administrative documents. New servers provided necessary capacity and increased reliability for electronic mail (E-mail) and Internet traffic and for new systems. Information dissemination initiatives included installing multimedia equipment, renovating the briefing theater, revamping the ADB web site, upgrading the public information centers, and establishing a media briefing center.

4. Following the midterm review, the lessons learned from the INTEGRA project were analyzed in order to plan for the next steps. The results were presented to the Board's Budget Review Committee in May 2002 and formed the basis for Management deciding to proceed with an IT strategic planning process, formalize IT governance processes, and develop the next IT strategy with a focus on operations requirements.

II. INFORMATION SYSTEMS AND TECHNOLOGY IN ADB TODAY

5. The IT environment in ADB consists of data and information, information systems, technology infrastructure, and management and organization structures that support the delivery of IT services. The following assessment of the current IT environment is based on

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1 ADB. 1998. *Information Systems and Technology Strategy and Capital Expenditure Requirements: 1998–2002.* Manila.

2 ADB. 2001. *Information Systems and Technology Strategy and Capital Expenditure Requirements (1998–2002) Midterm Review.* Manila.

interviews with members of the ITC, designated representatives from all departments, and the Office of Information Systems and Technology (OIST) staff; a review of leading practices in comparator institutions; and an analysis of lessons learned during ISTS implementation.

A. Strengths

6. ADB has numerous information systems that were developed gradually during the past 20 years and cover all functional areas of the organization. Financial and human resource information systems using Oracle application software were recently added with the implementation of the INTEGRA project, the TRMS is expected to be operational in 2004, and a new loan accounting system needed to handle the new London interbank offered rate (LIBOR)-based loan products is being implemented. In addition to the financial and operations data stored in information systems, a significant amount of information is contained in documents. A number of document repository systems are accessible from ADB's internal network (intranet). A powerful facility allows users to search for information on the intranet and across all document repositories. Document repositories currently available to staff include project-specific documents such as project appraisal, project completion, project performance audit, and environment impact assessment reports; policy papers; and administrative documents.

7. The official ADB web site has a consistent "look and feel" and is extensively used, with about 400,000 visits per month. Its main emphasis is on information content with the main function being cross-referencing of documents and a search capability. Significant progress in intranet development and improving the management and coordination of this function has been made over the past 2 years. OIST has developed standards for future web development and all systems currently under development adhere to these standards.

8. The technology infrastructure in place in ADB consists of (i) servers, which are computers that run information systems, databases, and related utility software; (ii) personal computers and peripherals; (iii) the data network, consisting of cables, shared printers, and network equipment; and (iv) the telecommunications network. With the recently introduced regular replacement scheme funded out of the annual capital budget, ADB staff are provided with reliable desktop and notebook computers, with a variety of options available depending on business requirements. Desktop and network printers are being replaced as they become obsolete. In addition, work stations equipped with specialized peripherals such as scanners, business card readers, and compact disk writers are available in each division. Newly established contractual arrangements allow for the fast delivery of needed equipment.

9. The data network represents a key component of the technology infrastructure as it enables access to all information systems and information. The primary network infrastructure in the headquarters building was replaced in 1999 with up-to-date, high performance optical fiber vertical cables and with reliable network equipment to support requirements. The horizontal cables linking all work stations to network equipment known as switches are currently being replaced.[3] This project is expected to be completed in 2004. Telecommunications facilities include telephone exchanges and lines at the headquarters and in field offices, videoconferencing equipment, links between the headquarters and field offices, links to the Internet, and facilities for access by traveling staff. Large resident missions and all representative offices are linked through satellite or leased lines, while smaller resident missions connect to headquarters through the Internet using a technology called virtual private

[3] ADB. 2002. *Special Capital Budget Proposal Replacement of ADB Headquarters Horizontal Cabling*. Manila.

network. Videoconferencing facilities are being expanded as the need is increasing in headquarters and in field offices.

10. The ISTS II was formulated under a new IT governance model established in 2002. At the ADB management level, IT governance is provided in two ways. The IT Steering Committee, chaired by the vice-president (finance and administration) and comprising heads of all departments and offices, ensures alignment with the corporate strategy, and endorses the strategy and related investments. The ITC is responsible for (i) reviewing IT requests and setting priorities for IT investments, (ii) ensuring that cross-departmental business processes are supported, and (iii) periodically reviewing progress on implementation of IT projects. At the working level, representatives from departments and offices formulate the requirements and work closely with OIST in formulating and implementing IT projects.

B. Weaknesses

11. A key dimension of an IT environment concerns the manner in which data are structured; how they are defined; how data and information flow through an organization; and how the interrelationship between data, information, and business processes is established. Except for the financial and human resource information system, ADB's information systems have been developed to support specific functions and business processes for one department rather than with an ADB-wide perspective in mind. As a result, while ADB has undertaken an ambitious agenda to ensure better measuring, monitoring, and managing for development results, its current IT environment is not capable of providing the needed supportive information and data flows. Currently, business data reside on various systems and storage media and few standards are established for data definition and structure. While a number of document repositories are accessible from the intranet, other document repositories are not, and a large number of other important documents are not digitized and therefore not accessible by electronic means. Important information resides in the memory of staff members and is not captured in any form. The disparity in the way information systems deal with data means that it is difficult to use and analyze business information, and support new knowledge management initiatives. This problem has implications for the effectiveness of ADB as an institution, and points to the need to establish a central database within a single technology architecture.

12. Given the numerous types of hardware and software (known as platforms), developers need to deal with multiple programming languages and development environments, as well as issues related to the communication between different platforms. The oldest platform is the mainframe computer used for some of the systems that support the lending and technical assistance (TA) operations and were first developed in the early 1980s. These systems are not flexible and cannot be enhanced to support the new organization and business processes. The "buy versus build" approach adopted during the past 5 years for major systems, such as the TRMS, has provided advantages in terms of speed of deployment, but has exacerbated the platform complexity issue. In addition, the diversity of information systems platforms makes information difficult to access for ADB staff as they need to learn how to use different systems and memorize several passwords. To illustrate, Appendix 1 provides a list of major information systems, the year of first implementation, and the replacement status.

13. ADB currently produces more than 2,000 reports, some of which are automatically generated by existing information systems while other are prepared manually. The nature and extent of ad hoc reporting and the lack of easy access to critical data and information result in excessive effort being expended to meet basic reporting needs. The limited reporting capability and lack of access to data and analytical tools also limit the ability to quickly analyze historical

data or project future trends. Few tools are available to support teamwork and collaboration, and staff lack awareness of what is available and how best to use it in support of work processes. Data cannot be automatically moved from existing information systems to the ADB web site, due in part to the design structure of the web site but also to the lack of cohesive ADB-wide standards for information structures. As ADB moves to more public disclosure and access to external stakeholders, the need to make more analytical data accessible from the ADB web site makes it urgent to address this issue.

14. ADB has more than 100 servers running a variety of software, and a mainframe computer. While many servers have been consolidated, some servers have been added during the last 5 years. Further consolidation is warranted to reduce complexity, improve efficiency, and reduce the cost of maintenance and support. ADB does not have a uniform set of standards with which all technology must comply. This lack of standards contributed to the proliferation of hardware and software platforms and the subsequent problems users have in learning new systems and accessing data. ADB has no established program for the regular replacement of servers, network, and telecommunication equipment. Telecommunication services are provided by too many different contractors for effective management and least-cost pricing. Access to services for traveling staff is essential and needs to be expanded, and more secure and reliable services are needed.

15. ADB has a growing multiplatform technical environment, an increasing number of information systems, newly introduced technologies, and an increasing number of resident missions. This increasingly complex environment is straining OIST's resources. As new platforms and systems are introduced, skills required to implement, manage, and support these systems must be acquired. At the same time, the older systems require continuing support and maintenance, and focused efforts are needed to eventually discontinue them. A review of existing work programs indicates that OIST staff spend a high percentage of their time dealing with maintenance or immediate problems as well as procurement activities. This leaves less time for staff to coordinate requirements, and design and develop new systems, but also for the less critical but equally important tasks of improving standards, system and change documentation, planning, and routine maintenance procedures. Overall, ADB's capacity to carry out new large IT projects is limited, both in terms of staff resources and management capacity.

C. Business Continuity

16. ADB's current disaster recovery plan details procedures for problem determination and off-site recovery of selected information system operations in two alternate locations, one in Manila and one in Hong Kong. ADB staff are dispatched to test the recovery procedures yearly in both locations. The procedures were extended in 2002 to include the Oracle applications. However, the plans focus on the recovery of specific systems and their associated data. The plans lack integration with other facilities such as E-mail and telecommunications, and with overall ADB concerns and new perceptions of threats from outside. A formal structure has been established to prepare an ADB-wide business continuity plan that will include IT service continuity as a component of the overall plan. Under this initiative, a business impact analysis was conducted to identify critical systems and their infrastructure dependencies, relative priorities, risks to the systems, acceptable risk levels, and required recovery time and back up needs for the critical systems. The continuity plan is expected to cover a comprehensive set of actions to be taken before, during, and after a disaster to ensure that ADB personnel can communicate and continue to carry on business activities. Separate approval and funding will be sought for the plan, and its requirements are therefore not covered in this paper.

D. Lessons Learned

17. ISTS accomplishments are described in Appendix 2. An assessment of the lessons learned from the implementation of the ISTS was a key element of the preparatory work for the ISTS II. The flexibility in adjusting project scope and reallocating funds between projects allowed OIST to adapt to new technology that was not foreseen when the strategy was formulated. The technology infrastructure improvement projects were implemented smoothly and successfully, building on the investments made during the previous IT strategy period. Internet and intranet facilities have been vastly improved and some document repositories have been established. However, information system projects have encountered difficulties. The scope of the INTEGRA project had to be revised when it became apparent that the software package could not meet the business requirements of the operations departments within the budget. In the end, the Oracle applications implemented to support the finance and human resources areas provide a solid software platform on which to build new integrated information systems. With regard to the TRMS, funds had to be reallocated to accommodate the requirements. While the initial scope of the TRMS envisioned an integration with the back-office, the final scope focused on treasury risk management due to the complexity of the back-office integration.

18. With regards to INTEGRA, the original project design assumed that the organization was ready for the introduction of substantial business process changes that would be required to implement a packaged, versus custom-built, information system. This has turned out not to be the case. There was no detailed needs assessment in the operations area and therefore the fit between the package and the requirements was misjudged. The resulting additional cost involved in reconciling package and requirements combined with a lack of ownership resulted in the operations module being dropped. An overall review of the ISTS projects indicates that the likelihood of success is also related to the size and complexity of the projects. INTEGRA, the largest project in the ISTS, experienced significant reductions in scope and implementation problems. Finally the procurement processes were not suitable to procuring IT goods and services. Lengthy and costly contract negotiations affected most ISTS projects.

19. There are five key lessons learned from the ISTS which have been incorporated in the formulation of the ISTS II. The lessons are elaborated below:

(i) Select IT projects that provide business value to ADB. A highly participatory process was followed in the formulation of the ISTS II, with an interdepartmental working group and the active participation of operations departments. The business requirements were then reviewed and prioritized by the ITC and endorsed by the IT Steering Committee, resulting in a set of projects that truly reflect ADB's needs.

(ii) Establish appropriate and effective institutional mechanisms, including business sponsorship. The identification of sponsors for information system projects was an integral part of the formulation of the ISTS II. The sponsors have committed the time and resources that will be necessary for successful implementation. For each project, project committees and functional teams from the sponsoring department will be established with representation from all concerned departments and offices.

(iii) Identify projects with manageable size and scope, and with efficient procurement packages. System components will be made available at regular intervals of around six months. In this way, benefits will be realized throughout the implementation period. Projects and procurement packages will be of a manageable size with greater flexibility to adjust and manage project scope, and to adapt to change. The IT procurement processes will be streamlined with due regard for transparency and fairness.

(iv) Develop mechanisms to deal with and manage changes in project scope. A program management office will be established within OIST under the normal chain of command. The office will provide regular reports; and work closely with the Budget, Personnel and Management Systems Department (BPMSD). The office will be required to recommend canceling or deferring projects that encounter implementation problems. Appropriate mechanisms for such action have been incorporated in the internal guidelines and financial controls instituted. The program will be reviewed regularly, in consultation with all concerned, and with inputs from the independent validation and verification. Under this framework, the ITC will be responsible for ensuring that issues are resolved between stakeholders and providing clear direction with respect to requirements and scope to OIST.

(v) Follow sound program and project management methodologies to ensure delivery on time and within budget. The principal accountability for the delivery of the ISTS II will rest with OIST. In addition, a governance framework has been established to ensure the effective implementation of the ISTS II. BPMSD will closely monitor the utilization of funds. This will strengthen the accountability for ISTS II implementation and the ability of the office to raise and resolve implementation issues in a timely and effective manner. The Office of the Auditor General will oversee audit arrangements and an independent validation and verification program.

E. Summary of Current Issues

20. The assessment of the status of information systems and technology in ADB has highlighted a number of issues that need to be addressed. They are as follows:

(i) An ADB-wide view of data and information is needed.
(ii) Staff need easy access to data and transaction processes from various systems and storage media.
(iii) Access to documents is needed in line with the knowledge management framework.
(iv) Information systems need to be aligned with the new organization structure.
(v) Tools are needed to manage for results.
(vi) Information systems supporting the operations areas are old and no longer meet needs.
(vii) Reporting and analytical capabilities need to be provided.
(viii) Tools to support teamwork and collaboration need to be introduced.
(ix) Data flow between the Internet web site and intranet needs to be improved.
(x) Network management tools and redundancy are needed to strengthen the telecommunications network and support the resident mission policy, developing member countries (DMCs), and remote users.

(xi) Programs are needed for the regular replacement of servers, and network and telecommunication equipment.
(xii) Additional OIST resources and skills are needed for new initiatives.
(xiii) IT governance processes need to be developed and implemented to ensure the business value of IT projects.
(xiv) Business continuity and external threats need to be assessed.

F. Information Technology in ADB's Comparators

21. ADB is in regular contact with the chief information officers of major international development institutions. In February 2003, a meeting was held in Washington to improve knowledge exchange, discuss IT strategies, and share information on new initiatives. Meeting participants included ADB, and African Development Bank, European Bank for Reconstruction and Development (EBRD), Inter-American Development Bank (IDB), International Monetary Fund (IMF), International Finance Corporation (IFC), United Nations Development Programme (UNDP), and the World Bank.

22. Of particular note is the approach to planning, financing, and execution of IT-related investments. All comparators develop multiyear strategies with corresponding capital budgets. Given the long-term nature of IT development, the multiyear approach, averaging 3–5 years, provides an assured source of funds and enables effective planning and the timely and efficient implementation of IT investments.

23. A common theme among IT strategies of the comparators is the linkage between IT investment and operational strategies and work programs. This is essential to provide improved resource management and decision support. Knowledge management initiatives gain prominence in international development, and supportive technology is crucial for the collection, cultivation, and dissemination of knowledge. Knowledge management is a key theme in the IT strategies of comparators, in particular IDB, IMF, and the World Bank.

24. While the World Bank strategy took the approach of building up integrated systems and then supplying a user interface, IFC has provided the user interfaces to access existing information, while gradually replacing the older mainframe transaction processing systems. IDB has developed facilities using portal technology to provide access to many disparate systems, and the World Bank uses similar facilities for information and communications technology development and sharing of information with member countries. ADB's initial portal applications are designed to support the Regional and Sustainable Development Department (RSDD) and provide access to knowledge management applications for sector and thematic networks.

25. Three key success factors have contributed to the effective implementation of comparator IT strategies that were implemented on time and within budget. First is an emphasis on IT governance. Representatives from throughout the organization are part of formal IT committees that prioritize requirements and review development and implementation. Management review committees at the vice president level endorse the IT strategies before board approval. Second, the IT requirements are gathered from throughout the organization with a focus on IT for business value. The active involvement of the operations departments has been valuable in ensuring that priorities are broadly supported and in ensuring that the scope of the projects remains under control. The business units are responsible for making the decisions associated with analyzing cost versus benefit. Third is the emphasis placed on training and customer support. A unit within the IT organization provides for change management and new systems are only activated when users have completed the required

training program. The follow-on customer support during implementation and operations of the systems is essential and contributes to staff understanding and the ultimate success of the strategic initiatives.

III. THE STRATEGY

A. Context and Vision

26. The strategic context for ISTS II is provided by ADB's vision of an Asia and Pacific region free of poverty and the new global agenda on results and effectiveness. The Long-Term Strategic Framework (LTSF),[4] the Medium-Term Strategy (MTS),[5] the report on the Reorganization of ADB,[6] the report on Knowledge Management in ADB,[7] and the new agenda and action plan for managing for development results provide the following guidance in formulating an IT vision and strategic objectives and directions.

(i) ADB will need to better measure, monitor, and manage the development impact of its operations. IT should enhance the ability to monitor performance against LTSF objectives by providing the capacity to review project processing and portfolio performance by core strategic areas (sustainable economic growth, inclusive social development, and governance) and by crosscutting strategic themes (private sector development, regional cooperation, and environmental sustainability).

(ii) ADB has endorsed the Millennium Development Goals (MDGs). IT should provide enhanced capacity to track macroeconomic indicators in member countries and monitor performance against MDGs, and should allow monitoring of projects and the extent to which they address the MDGs and the poverty reduction objectives of ADB.

(iii) ADB's result agenda and action plan stress a longer-term view with respect to development. IT systems should facilitate tracking of a series of related activities and investments that together form a single development initiative with measurable and monitorable indicators at each stage of the process.

(iv) The LTSF indicates that new assistance modalities and instruments will be investigated and that regional and subregional activities will have greater visibility. IT solutions need to be flexible enough to provide for the changing processing and reporting requirements.

(v) The LTSF, MTS, and the knowledge management framework stress ADB's transition to a learning organization. IT can provide tools to help create and disseminate knowledge and assist the collaboration among staff.

(vi) ADB's results-based agenda and the action plan stress the need to measure and track performance over time. IT systems will need to provide the tools to report on project performance from concept paper through postevaluation.

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[4] ADB. 2001. *The Long-Term Strategic Framework of the Asian Development Bank (2001–2015).* Manila.
[5] ADB. 2001. *Medium-Term Strategy (2001–2005)*. Manila.
[6] ADB. 2001. *Reorganization of the Asian Development Bank.* Manila.
[7] ADB. 2004. *Knowledge Management in ADB*. Manila.

(vii) ADB's action plans will necessitate the improvement of integrated resource management, particularly for assessing the costs associated with delivery of the country strategies and programs (CSPs) and adequate resourcing of country programs. IT systems should support improved planning, management, and reporting with respect to integrated resource requirements, use, and management.

27. The MTS and the knowledge management framework also promote the use of strategic alliances and partnerships, which suggests the need for knowledge-sharing tools and the ability to provide access to ADB's systems and knowledge bases to external and internal stakeholders with whom ADB collaborates. For example, DMCs need access to financial information and knowledge while all member countries need access to operational and financial performance data of ADB. Civil society will look for accountability, benefits, transparency, and participation. Other development partners are interested in collaboration and harmonization while business partners will look for business opportunities and information on doing business with ADB.

28. An important component of the ISTS II is the formulation of an IT vision for ADB to provide a link between its strategic objectives and the IT strategy. A workshop was held in 2002 with the participation of ITC members, senior staff, and consultants to formulate a vision. The IT vision statement, which was reviewed and endorsed by the IT Steering Committee, is as follows.

> The ADB IT vision is to provide access to knowledge and information any time, any place in support of ADB goals. ADB will use IT to improve productivity, efficiency, and effectiveness in its fight against poverty in Asia Pacific.

B. Business Requirements

29. The IT vision provides an indication of the business requirements and the overall objectives of the strategy. With the IT vision as a reference, the business requirements for the ISTS II were derived through a series of interviews with senior ADB staff and participatory workshops with departmental representatives and OIST, in keeping with an IT governance model that recognizes that IT should provide business value. The business requirements are summarized in the following paragraphs.

30. **Focus on Operations**. Most of ADB's current information systems have been developed to support financial and administrative transactions, with limited support available for the primary business processes associated with CSPs, and project processing and portfolio management and administration. Furthermore, the existing systems do not support the new organization structure, particularly in the area of knowledge products and services and private sector processing and administration, nor do they support the new results-based agenda. Lessons learned and analyzed through project completion and evaluation activities should be available and accessible in preparing CSPs and new loans and TAs. There is a clear need to track project activities and their corresponding financing modalities (loans, TAs, private sector investments, and knowledge products and services), from the time they are identified in the CSPs until they have been completed and evaluated. There is also a need for tools to manage for results at the strategic level; to measure and monitor indicators above the project level, at the level of countries, regions, and sectors; and to provide thematic information including information related to capacity building and economic and sector work. These processes will need to involve ADB customers such as executing agencies in DMCs.

31. **Maximize Knowledge Sharing**. The LTSF and MTS refer to ADB as a learning organization. The knowledge management framework also emphasizes the need for ADB to provide knowledge services to external clients and development partners, as well as managing knowledge more effectively internally to improve the quality of development products and increase efficiency. This requirement emphasizes the need for systems that facilitate the creation, capture, and dissemination of ADB information and for tools that enable collaborative work practices. Better tools should be provided to support teamwork and collaboration in support of knowledge management. This focus also extends to external stakeholders, including DMC governments, development partners, business partners, and the public.

32. **Improve Information Management**. All information should be treated as an ADB-wide resource, and systems are to be developed to take an ADB-wide view, rather than a departmental or functional view. The management reporting environment should be easy to use and provide timely and accurate data. The ability to analyze business information has been identified as a critical requirement, which means developing flexible and powerful analytical and reporting tools and systems to facilitate regular and ad hoc reporting requests and to ensure that these systems are available to staff regardless of their physical location. A set of common, accurate, and integrated data structures are to be developed. This requires standard ADB-wide definitions and terminology.

33. **Improve IT Governance.** IT investments must be justified on business terms. To improve value for investment, ADB must develop a business and IT partnership model to ensure adequate levels of sponsorship by operations departments and to improve the identification, prioritization, planning, and implementation of IT projects. This requires an IT office that proactively develops partnerships with other departments and is able to adjust to changing business priorities and expectations while maintaining consistency with the IT vision. OIST's ability to advise others on the best possible use and leverage of technology is a critical success factor. OIST also needs to build internal capability to effectively use and manage IT resources. Solid program and project management, high-standard design and development methodologies, implementation guidelines and financial controls, and an independent validation and verification program should be introduced to ensure that IT projects are delivered on time and within budget. These initiatives as well as stringent project monitoring and control mechanisms are needed to strengthen ADB's ability to deliver systems that meet the requirements, and to mitigate some of the technological uncertainties that are inherent in IT solution development. An IT risk management capability should also be developed to allow ADB to effectively scrutinize technology-related IT risks and opportunities and choose those technologies that provide substantial added value to the business.

34. **Provide IT Systems and Access on Demand.** ADB has a diverse range of business operations and activities across its member countries. At any given time, several hundred staff members are working from remote locations, at home, in resident missions, or while traveling. A key need identified by staff is to ensure appropriate levels of access to information systems and services by staff at all times and from many types of locations. Comprehensive, disciplined, and proactive capabilities should be established to ensure that adequate levels of IT service are delivered in accordance with business priorities and at an acceptable cost. As ADB comes to rely more heavily on databases and knowledge management systems, a comprehensive disaster recovery plan should be integrated into the ADB business continuity plan to provide ADB with a measure of operational contingency that is not available today.

35. **Simplify the IT Systems and Service Environment**. The complexity of the information systems and technology environment needs to be reduced through standardized tools and platforms. This will increase the resources available to support and enhance individual systems and lead to better efficiency of IT operations. A systematic technology planning discipline is needed to ensure that ADB adopts appropriate technologies in a timely fashion. The telecommunications network must be optimized through consolidation of carriers, least-cost pricing, and implementation of performance guarantees and other management tools. The ISTS II should incorporate flexibilities to adjust for business changes, market development, and new products.

C. Objectives of the Strategy and Guiding Principles

36. The strategy was designed to meet the requirements; realize the vision of providing access to knowledge and information any time, any place; and improve productivity, efficiency, and effectiveness, all within an appropriate budgetary framework. Therefore the strategy has the following objectives: (i) provide systems and data that support ADB's results-based agenda and action plan on managing for development results, (ii) deliver a framework for knowledge management solutions that provides for internal and external exchange of information, (iii) institutionalize the business and IT partnership to foster the appropriate degree of ownership and direction, and (iv) develop an enabling IT infrastructure and services that are secure, available, responsive, and reliable.

37. Guiding principles have been adopted to help ensure that the vision is realized, and the objectives of the strategy are met. They reflect the leading industry practices and lessons learned from comparators and the ISTS. The principles will be used in the overall design and delivery of information systems, reporting solutions, technology, and IT management systems. The guiding principles are as follows:

(i) A business sponsor will be required for all IT projects to ensure that IT solutions meet the priority needs of ADB and that departments have an appropriate level of business ownership for all IT projects. Sponsors will be responsible for setting broad directions and making key decisions with respect to project design, development, and implementation; ensuring that appropriate resources are available for the project; communicating project objectives and status to the ITC and Management; and resolving major issues as they arise, particularly crossdepartmental issues.

(ii) Every IT investment will be based on a business case that will be developed prior to the start of every component and that will clearly lay out the investment and recurring costs and associated benefits. This will help to focus on high value-added investment and an effective use of IT resources.

(iii) All future system design will start with a business process review. Based on the review a redesign of businesses process may be required prior to automation. Business processes should be optimized and streamlined to reduce administrative overhead and contain the cost of new systems.

(iv) Information systems and their data are seen as an ADB asset. Adherence to this principle will ensure that data is stored, verified, and accessible by all users across ADB as well as external parties where applicable. All information systems will be developed with due regard to the public communications policy.

(v) The primary interface between the user and all new systems will be the standard interface used to access the Internet (a web browser) on personal computers. This will facilitate the "any time, anywhere" aspect of the IT vision and will support collaboration with external stakeholders.

(vi) Initiatives will be implemented within the framework of an "enterprise architecture," which is a set of guidelines, concepts, principles, rules, patterns, interfaces, and standards to be followed when building a new IT capability or enhancing an existing IT facility.

(vii) Users must have access to information and systems any time and anywhere. IT solutions and services must be delivered in the most secure, efficient, and cost-effective manner.

IV. INITIATIVES

38. During the formulation of the ISTS II, key business processes were reviewed and the quality of system support for these processes was assessed. The cost of maintenance and stability of existing technology and information systems was assessed. The ITC considered different scenarios and established priorities. This process resulted in a series of initiatives required to address the business requirements and meet the objectives of the strategy. The initiatives can be grouped into three major components: (i) the development of high priority information systems needed to meet the business requirements, (ii) the implementation of the underlying technology infrastructure necessary to run the systems, and (iii) the IT governance required to implement the strategy. An indicative schedule for implementation of all initiatives is presented in Appendix 3.

A. Information Systems Initiatives

39. The needs to be addressed in relation to ADB's current portfolio of information systems include ADB's approach to managing for development results, the changes resulting from the reorganization, the increased focus on knowledge management, the age of the software (with many systems approaching the end of their useful life), and technology platform complexity. Six initiatives were identified during strategy formulation on the basis of current business requirements and an assessment as to how the existing systems are meeting those business requirements. The initiatives are:

(i) knowledge management systems,
(ii) project processing and portfolio management systems,
(iii) resource management systems,
(iv) other financial and administrative systems
(v) hardware and software for information systems, and
(vi) enterprise architecture.

1. Knowledge Management

40. The components of the knowledge management initiative are aimed at improving ADB's ability to capture, store, access, and disseminate knowledge internally and externally. The initiative responds directly to new business requirements, and supports the proposed knowledge management framework and the objectives of the reorganization. As such, this

high-priority initiative is a key element of the strategy. Existing knowledge management systems, such as statistical databases and geographic information systems, will continue to be supported and enhanced and will be integrated with the new systems as applicable. Specific components of this initiative include the following:

(i) **Document Repository**. ADB has several disparate electronic document repositories. This component, to be sponsored by one of the regional departments, will bring the repositories together into one common, easily accessible repository with processes for capturing, search, and retrieval and with an ADB-wide classification structure. The component includes the design and development of a common ADB-wide taxonomy for systematically capturing relevant information. This repository will include documents such as the report and recommendation of the President, CSP, project completion report, TA consultant report, and back-to-office report.

(ii) **Smart Templates**. These tools combine the features of a form and a document template, and enable the automatic preparation of parts of reports by drawing data from information systems and document repositories. They will be developed for project documents such as the concept paper, CSP, report and recommendation of the President and TA paper. The use of smart templates, which will improve subsequent search and retrieval processes, will also facilitate automatic capture of key information into document and data repositories. The project will be sponsored by one of the regional departments.

(iii) **Skills Knowledge Base**. This system will provide easy access to a database of skills available from consultants and consulting firms and informal information about the skills, experience, and interests of ADB staff. It will replace existing systems used for registering consultants and generating shortlists. This project will be sponsored by the Central Operations Services Office (COSO).

(iv) **Communities of Practice**. Knowledge systems will be developed to support the sector and thematic committees and networks. “Communities of practice” is a collective term for the people and processes necessary to facilitate knowledge sharing within teams and with external stakeholders. Information provided will be a combination of text, documents, figures, statistics, and transactional data. Small-scale knowledge management applications were developed in 2003 for six sector and thematic committees as a preparation for the full development of the systems for all communities of practice. The project will be sponsored by RSDD.

(v) **Internet and Intranet Harmonization**. Under this component, to be sponsored by the Office of External Relations, the ADB Internet web site and the intranet site will be moved to a common technology platform that will allow content sharing and unified content management across both sites. This will be essential as the ADB web site evolves to provide more statistical and transactional information, such as poverty data and project information, that reside in databases that cannot be readily accessed from the ADB web site. Content sharing between the two sites will be regulated by guidelines to be established as part of the initiative.

2. Project Processing and Portfolio Management

41. The business processes related to ADB's project processing and portfolio management operate at two levels. The first level is the strategic planning process, which involves the preparation of CSPs and CSP updates with reference to LTSF, MTS, and MDGs, and that culminates in the 3 year work program and budget framework for ADB as a whole. The second level is the project cycle, which flows from project identification during the CSP process, through project preparation, implementation, completion, and finally postevaluation. The main objective of the initiative is to support the new agenda and action plan for managing for development results by providing the tools necessary throughout the organization. The initiative will support the strategic planning process and the tracking of operations activities and information throughout the project life cycle. The initiative will replace information systems rendered obsolete by the reorganization. During detailed design, the components will be further broken down into distinct projects that will be implemented incrementally. All components, except the first one, will be sponsored by one of the regional departments, with active participation of other concerned departments and offices. The components are as follows:

(i) **Management Information System**. The existing system, used for preparing the quarterly operations review meetings and for management reporting, is obsolete and fails to meet the current business requirements. This component is to be sponsored by the Strategy and Policy Department (SPD) and will develop a new system initially, drawing on the existing databases. The component will help validate some of the requirements for the other components and ensure the early realization of some of the benefits of the project processing and portfolio management initiative.

(ii) **Project Processing Management System**. The system will (a) record and report on the CSP processes and on projects identified in the CSPs up to the approval stage, with links to related documents; and (b) provide the ability to access the information by country, region, subregion, sector, theme, MDG, financing source, and other classification criteria. Support will be provided to programming and processing activities in the regional departments. The system will also provide information on funding sources, fund utilization status, and indicative planning figures. More generally, it will allow ADB to monitor progress in achieving strategic priorities and toward the MDGs. The system will need to be flexible enough to address future changes.

(iii) **Portfolio Monitoring and Management System**. This system will provide tools to track projects from approval to completion, including evaluation, and to monitor project milestones, compliance with covenants, social and environmental issues, benefits, and lessons learned. The system will facilitate preparation of reports such as project performance reports, and will combine and replace a number of systems with related functions into a single ADB-wide system.

(iv) **Portfolio Administration System**. This system will integrate all data related to loans, TAs, and private sector investments, including loan and TA details, subloans, profiles, milestones, cancellations, amortization schedules, and aggregated procurement and disbursement status. The system will be the main tool used by regional departments for loan and TA administration and will be designed to meet ADB-wide reporting requirements. The system will replace

several aging systems that have been operating for about 20 years and will be tightly integrated with the new loan accounting system currently being developed.

(v) **Procurement Management System**. This system will improve the ability to manage the procurement processes associated with lending operations. When business processes are reviewed and streamlined, the new system is expected to improve efficiency and provide expanded services to executing agencies, e.g., through the Internet for submission of contract data. The system will also provide enhanced report generation capabilities for procurement statistics and monitoring.

3. Resource Management

42. ADB's capacity to effectively manage and allocate internal resources in response to operations priorities has been the focus of the MTS, Management, and external stakeholders. A number of resource management information systems are needed to meet these requirements. Four components have been identified.

(i) **Program Resource Management System.** A new system for program resource management will help strengthen the linkage between strategic objectives, work programs, and resources, and provide a more systematic and quantified approach to resource planning and management. Regional departments have developed different ad hoc approaches involving manual processes and spreadsheets as the existing system is outdated and does not meet business needs. A management accounting function will also be developed to better capture costs for key activities and measure resource use linking to a range of outputs to facilitate results-based monitoring and analysis.

(ii) **Budget Management System.** An improved budget system will replace legacy systems and support budget preparation, monitoring, and management. For example, all departments, resident missions, and representative offices will have access to current and timely budget data for expense categories under their control, such as travel, consultants, and representation. The system will allow for automatic consolidation and segregation of information by any type of budget category and will replace numerous manual processes.

(iii) **Travel System.** The system will support travel administration and accounting, including mission and travel requests, itineraries, advances, and claims. Although the existing travel system generally meets the business requirements, it runs on the mainframe computer and is closely linked to the budget system. A new system will link with the other resource management components and to allow the eventual decommissioning of the mainframe computer.

(iv) **Consultant Contract Management System.** A new system is required to support the selection, recruitment, and contracting arrangements for TA and staff consultants. An important element of loan and TA administration consists of contract and procurement management activities. The business processes for these activities have undergone a number of changes and the existing systems are difficult to modify to fit the new requirements.

43. Resource management is a priority area. However, the implementation of some initiatives will be deferred due to ADB's limited capacity to absorb many changes at the same time, and insufficient staff resources and management capacity in business units and in OIST to carry out all the projects within a 5-year period. In determining priorities, the need to focus on knowledge management and operations was taken into consideration. Furthermore, additional analysis is required to define and institutionalize the resource management processes. Only the program resource management system is scheduled and funded as part of the ISTS II. The system will be sponsored by the Budget, Personnel and Management Systems Department (BPMSD). The other three components will be considered for scheduling during the latter part of the ISTS II period, when the associated business processes have been defined and the capacity issue reassessed. The delayed implementation of these components will not reduce the benefits of the scheduled and funded components of the ISTS II.

4. Other Financial and Administrative Systems

44. The primary focus of the information system initiatives is to support ADB's knowledge management and operations activities. However, adequate levels of support to financial and administrative activities must also be maintained, and provisions are needed to replace smaller financial or administrative systems, which are at the end of their useful life and for which maintenance requirements exceed the benefits provided by the systems. Examples of areas that will be included in this initiative are (i) resident mission and representative office accounting, (ii) staff benefits administration, and (iii) commissary and food services support. Some smaller systems, such as the shipment monitoring system will need to be replaced in order to reduce the number of platforms being supported, and other specific requirements will be identified from time to time. A pool of funds will be allocated to these projects and priorities will be established on an annual basis. The scheduling and implementation of projects under this category will be judged based on a business case, the capacity within OIST and the user departments to implement the projects, and the expected level of effort required.

5. Hardware and Software for Information Systems

45. This initiative provides for the acquisition and installation of hardware and software required to implement the new information systems. Separate environments will be provided for system development, testing, training, and actual use. This will ensure that the systems will be isolated from the potential impacts of problems that can occur during development and testing, and enable simulation of the systems in a test environment. Although the specific hardware and software requirements have been estimated separately for each information system initiative, they will be managed as one consolidated initiative to insure adherence to standards, reduce the number of servers, and realize economies of scale.

6. Enterprise Architecture

46. An "enterprise architecture" provides a framework for decision making and a blue print for the design and development of information systems and technology infrastructure. The architecture comprises design guidelines and technical choices that evolve over time as priorities change. A good enterprise architecture model will depict the organization as it is today and as it is envisioned in the future, and will map business perspectives and technical perspectives. Maintaining an enterprise architecture is a continuing endeavor. To enable ADB to deliver a 5-year strategy in discrete projects with a mix of packages and custom-developed systems, an enterprise architecture must be in place before the start of any major system development activity. The components of this initiative are the development of the architecture

and the implementation of two essential building blocks of the architecture: an enterprise portal and an operational data store.

(i) **Enterprise Architecture Development.** This project will involve (a) developing, publishing, and enforcing standards for how systems and technologies will communicate with each other; and (b) defining standard technical specifications. Common definitions for key elements of information and data will be determined. Interface software will be acquired and installed to allow communication between systems running on different hardware and software platforms within the architecture. Initial research activities were carried out in OIST to improve awareness of the issues and considerations needed when embarking on the development of an enterprise architecture. An initial architecture framework and a compliance process were implemented in 2003 with assistance from consultants as a first step toward introducing and enforcing standards, and better controlling the cost of infrastructure. Provision will be made to improve OIST's ability to monitor and review emerging technologies and test their applicability to ADB.

(ii) **Enterprise Portal.** An enterprise portal is a set of technology tools that allows access to information through a personalized web page using a single user name and password from any computer connected to the Internet anywhere in the world. A small project has been implemented in one department to validate requirements and to provide users and OIST staff with the technical skills to facilitate subsequent ADB-wide deployment. The enterprise portal project will involve assessing the lessons learned during the small project and the gradual deployment of the portal across ADB. Access by external stakeholders can also be provided in conjunction with the development of the necessary technical architecture and with due consideration to appropriate security measures. The portal will make it easier to provide the tools necessary to implement results-based management and will satisfy future requirements by facilitating the presentation of information tailored to specific users such as member countries.

(iii) **Operational Data Store.** An operational data store is a common, easily accessible database that integrates information from different systems, mixing data from old and new systems and from systems running on different platforms. It uses special software to extract, transform, and load data from the disparate databases. It also uses reporting tools to generate pre-defined reports and powerful report generation tools to allow business units to prepare their own ad hoc reports. One of the IT issues facing ADB is that reconciliation of data often involves cumbersome processes. For example, the preparation of annual report tables requires the extract and reconciliation of data from the project processing, loan administration, loan accounting, treasury, human resources, and other systems, a difficult and time-consuming exercise. The design and implementation of an operational data store will improve access to and consistency of data and information. The value of the operational data store will depend to a large extent on the active involvement of ADB users.

B. Technology Infrastructure Initiatives

47. The network and computing environment must be upgraded to continue to support the current IT infrastructure during the ISTS II period. While the network equipment and computing

platforms installed during the ISTS period are significant improvements, further investments are required to improve resilience to hardware and software failure, and achieve security needed to support the current and future requirements. The IT infrastructure must be made more adaptive and agile if information delivery systems are to respond adequately to emerging technologies and changes in business requirements. The following three infrastructure initiatives have been identified: (i) improving the data network, (ii) consolidating and upgrading servers, and (iii) improving the telecommunications network.

1. Data Network Improvement

48. The data network improvement initiative is designed to strengthen the infrastructure and improve the network management capacity at headquarters and the monitoring and trouble shooting capabilities for resident mission and representative office networks.

(i) **Network Management**. This project will involve implementing network and server monitoring software for existing servers not covered by the current network management system, for new servers to be installed as part of the ISTS II, and for all resident mission and representative office networks and servers. Critical points of failure in the network will be eliminated. A network test environment will be provided. The quality of the tools used to manage and monitor the network and servers will be improved and network security will be upgraded.

(ii) **Wireless Network.** This project will involve the testing and limited deployment of wireless technology in several meeting rooms at the headquarters. The use of wireless technology will improve the flexibility to install connections to selected areas.

2. Server Consolidation and Upgrade

49. To support the requirement of access any time and anywhere, the servers must be adequately managed and platforms further consolidated in line with the enterprise architecture and technology standards. This initiative is required to ensure that OIST staff can detect, predict, and report on server problems and monitor performance. The components of this initiative are as follows:

(i) **E-Mail Server Upgrades.** This component will include upgrading the electronic mail servers that will be required to increase functionality, capacity, performance, and reliability.

(ii) **Server Upgrades and Consolidation.** This component will include installing monitoring systems for human resources and financial information systems and diagnostic software to support the operational data store. The component will standardize and further consolidate server platforms in line with the enterprise architecture. Because the mainframe computer does not use the latest software, an upgrade may be necessary to maintain compatibility with other systems. The issue of upgrading the mainframe computer, which may be a relatively large undertaking, will be reassessed at the appropriate stage as part of the project risk mitigation exercise. Adequate funds have therefore been provided but the need for, and timing of, the upgrade is yet to be determined.

3. Telecommunications Network Improvement

50. The telecommunications network includes telephone services, Internet access, videoconferencing facilities, infrastructure for communication with resident missions and representative offices, and services provided to external stakeholders and traveling staff. This initiative is required to address the growing demands of resident mission and representative offices for increased capacity, reliability, and availability of IT services, and the rising costs associated with telecommunications. The components are as follows:

(i) **Telecommunications Contracts and Procedures.** Primarily aimed at improved governance of telecommunications, this component involves (a) the preparation of technical specifications for a set of consolidated contracts, and (b) the evaluation and eventual negotiation with the successful bidders. The component will involve the development of standard operating procedures to govern provision of telecommunications services within ADB and the implementation of more comprehensive backup and redundancy measures. It will also provide for the increase in capacity of the telecommunications links and the conversion of some of the links to use more cost-effective technology.

(ii) **Telephone and Videoconferencing Equipment Upgrades.** This component will provide for the replacement of obsolete telephone exchange systems in some resident missions and the upgrade of selected telecommunication equipment to support the upgraded telecommunication links. The component will also provide (a) new videoconferencing equipment in sites at the headquarters and in some resident missions that are not currently equipped with it, and (b) the upgrade of equipment to support new technology during the 5 year period.

C. Information Technology Governance Initiatives

51. The set of initiatives identified in the information systems and technology infrastructure areas is an ambitious program that will require strong IT governance to manage the projects and ensure ADB staff can absorb changes and new systems. Project management skills and new technical skills will be needed to oversee the strategy and lead project teams.

1. Program and Project Management

52. Given the number and complexity of the initiatives, effective program and project management capability within OIST and project sponsoring units is required to improve effectiveness and reduce implementation risk associated with the ISTS II. This initiative will involve establishing a program management office within OIST to manage the ISTS II at a program level and facilitate the achievement of business benefits. The initiative will include implementing a project management methodology and design and development standards, and introducing new procurement and contractual approaches and arrangements to support project implementation. Preliminary activities in 2003 included the finalization of the internal structure of the program management office and project reporting responsibilities, the preparation of job descriptions and terms of reference for staff and consultants, and a market review of currently available project management methodologies and software tools. The proposed structure will augment the current organization, establish clear lines of communication and reporting responsibilities, and create an organization that can respond quickly to internal business changes and market and technological advances, assuring that the most appropriate and effective solutions are developed. The development of an enterprise architecture will

necessitate improved cross-functional communication and a closer relationship between the information systems developers and the infrastructure managers. The initiative will involve determining an appropriate organization structure and standard operating procedures for OIST, and developing a plan to assist with the transition to the proposed structure.

53. Staff training and development is an essential aspect of the ISTS II and will be coordinated by the program management office. Significant training components are incorporated in all initiatives, including technical training for members of the project teams, and training for users of the systems or facilities. Training will be scheduled so as to ensure efficient use of the systems as they become operational. Such training will focus on the introduction of new technologies to ensure that staff understand the advantages and adopt them. In addition to specific training related to ISTS II projects, efforts will be made to provide staff with more job-specific training and guidance on how to make the best use of systems and facilities available, to ensure the maximum gain in efficiency and effectiveness resulting from IT solutions. Change management issues are closely related to training and have been assessed and covered within each of the initiatives. Added emphasis will be given to support for all postimplementation activities.

2. IT Security

54. The IT security policy includes basic security principles, including administration of protection servers known as “firewalls”, intrusion detection systems, computer virus protection software, and procedures for physical security of IT assets. Implicit in all ISTS II initiatives is adherence to the security goals and objectives expressed in the IT security policy. Several ISTS II initiatives include provision for strengthening standards and systems to ensure privacy, data integrity, and prevention of unauthorized access. In addition, the review of the IT organization structure will assess the need to establish a centralized IT security function within OIST.

55. A working group is currently reassessing the ADB approach to business continuity (para. 16). A key element of the assessment is the identification and mitigation of risks to both data and technology. The first component of the IT security initiative is to identify the IT-related risks currently being assumed by ADB, determine an acceptable risk profile, identify and institutionalize mitigation measures, and develop policies on information security. The result will be an essential input for the business continuity plan. The second component of the initiative is to assess the potential security issues associated with providing increased access to ADB data and information systems through web and portal technologies and to determine the long-term IT security framework needed to support information disclosure to ADB external stakeholders. The exact scope of integrated security measures required at ADB will be studied and is not clear at this time. Funds are therefore provided for implementing integrated security measures, but the extent, timing, and sequencing will be determined based on the findings of the study.

3. IT Service Improvement

56. OIST’s ability to meet expectations for IT services that are secure, available, responsive, and reliable needs to be improved. First, procedures and standards for resource allocation will be designed and implemented for IT service management. In a second stage, an IT service management software package will be considered to automate procedures and standards and to provide tools by which changes to IT infrastructure can be implemented more proactively. The initiative will include the following:

(i) OIST will install an integrated searchable knowledge base of solutions to common problems and frequently occurring errors. Mechanisms for identifying, managing, and monitoring problems until services have been restored will be developed. The mechanisms will include procedures for identifying problems and escalating them to the appropriate group for resolution. OIST's ability to respond quickly to IT service and access problems will be enhanced.

(ii) OIST will implement network and server monitoring systems that will be linked to the IT service management software and will (a) enhance OIST's ability to identify potential problems that can affect IT service delivery including network capacity and availability, and (b) help in the transfer of systems resources to areas of greatest need.

(iii) Standards and procedures to strengthen change and software release management capacity will be developed within OIST to ensure that changes due to the introduction of new technology or information systems and new versions of software can be implemented efficiently and with low risk of service disruption.

(iv) Systems performance measurements will be developed and mechanisms implemented to track and report on performance with respect to IT service delivery.

4. Independent Validation and Verification

57. As part of its responsibility, the Office of the Auditor General will periodically review the implementation of the ISTS II. The review will include an evaluation of (i) the structure and mandate of the program management office and whether it supports the governance and supervision of the project in an effective and efficient manner, thereby enabling the completion of the project on time and within the approved budget, and meeting the expectations of the users; (ii) whether the enterprise architecture being established is scalable and flexible, conforms with the industry standards, and is cost effective; and (iii) whether the critical application systems being developed have requisite internal controls, and provide optimal operations efficiency. An independent validation and verification program has been prepared and endorsed by the external auditors, covering IT governance reviews, system development reviews, and general IT control reviews. The Office of the Auditor General will seek the services of consultants, especially for aspects that need special expertise. The inputs and recommendations of the program will be given due consideration and acted upon as appropriate, and midstream adjustments made as required. In consultation with the ITC, OIST will be responsible for the timely implementation of the recommendations under the program to ensure early and systematic resolution of potential issues and problems identified by the reviews.

D. The ADB Workplace in 2009

58. Once successfully implemented, the ISTS II initiatives will move ADB to the desired IT environment. A glimpse of the ADB workplace envisaged in 2009 is presented in the Box.

The ADB Workplace in 2009

- A single user name and password gives access to all ADB (Asian Development Bank) information services.
- Access to information services is available to authorized users from any computer connected to a telephone link anywhere in the world at any time.
- Information is accessible from an easy-to-use personalized page on a web browser with consistent presentation.
- Instruments, indicators, and trends are available to enable staff to manage for development results.
- A complete view of the portfolio of proposed and approved projects is available, from project identification to project evaluation and full loan repayment, in summary and in detail.
- ADB documents from Board papers to back-to-office reports are accessible through links in project portfolio information systems or a powerful search engine.
- Information is available on-line on skills and expertise of consultants registered with ADB.
- Users generate predefined reports on ADB operations by region, country, sector, or theme, or use powerful report generation tools drawing from a central database.
- Templates are used to prepare documents in a consistent fashion and facilitate subsequent search.
- Resident missions have full data, voice, and videoconference connections to headquarters, and quality support for their equipment, network, and connections.
- Office of Information Systems and Technology service agents provide efficient problem solving and request filling services.
- ADB clients and stakeholders have controlled access through the Internet to ADB information relevant to a responsive and transparent business relationship.
- Executing agencies and other business partners process loan withdrawals and claims using tools on the Internet.

V. BUDGET AND IMPLEMENTATION ARRANGEMENTS

A. Capital Expenditure Requirements

59. The total cost of implementing the proposed ISTS II is $55.47 million. The 2004 annual capital budget included $1 million for priority and essential expenditures required to maintain the current IT infrastructure. An amount of $5.56 million will be funded from the capital budget for the new loan accounting system to handle LIBOR-based loans approved in March 2002[8]. The net capital expenditure budget required is $48.91 million as detailed in Table 1. The cost estimates include provision for fixed-term professional staff positions, international and local consultants and contractors, procurement of hardware and software, and training. A combined price and physical contingency of 10% is included for each initiative, and a general contingency of 10% at the overall ISTS II level. The contingencies are required because ADB and the technology will continue to change during the period. The contingencies will provide for price escalation and unforeseen events, and are in line with industry standards for programs of this nature. The use of program contingencies will be strictly controlled according to implementation guidelines.

[8] ADB. 2002. *Capital Expenditure Proposal for the New Loan Accounting and Asset-Liability Management Systems*. Manila.

Table 1: Cost Estimates and Financing Plan
($ million)

Initiatives	ISTS II Budget Part 1	ISTS II Budget Part 2	ISTS II Budget Total	Loan Accounting Budget	Loan Accounting Total
A. Information Systems Initiatives					
1. Knowledge Management	3.60	1.83	5.43	0.00	5.43
2. Project Processing and Portfolio Management	3.92	0.00	3.92	3.88	7.80
3. Program Resource Management System	0.00	1.32	1.32	0.00	1.32
4. Other Financial and Administrative Systems	0.70	0.00	0.70	0.00	0.70
5. Hardware and Software for Information Systems	2.33	0.64	2.97	1.17	4.14
6. Enterprise Architecture	5.48	2.47	7.95	0.00	7.95
Subtotal (A)	**16.03**	**6.26**	**22.29**	**5.05**	**27.34**
B. Technology Infrastructure Initiatives					
1. Data Network Improvement	2.71	0.99	3.70	0.00	3.70
2. Server Consolidation and Upgrade	2.94	3.51	6.45	0.00	6.45
3. Telecommunications Network Improvement	1.55	0.67	2.22	0.00	2.22
Subtotal (B)	**7.20**	**5.17**	**12.37**	**0.00**	**12.37**
C. Information Technology Governance Initiatives					
1. Program and Project Management	2.70	1.27	3.97	0.00	3.97
2. IT Security	0.21	4.45	4.66	0.00	4.66
3. IT Service Improvement	0.69	0.69	1.38	0.00	1.38
4. Independent Validation and Verification	0.40	0.30	0.70		0.70
Subtotal (C)	**4.00**	**6.71**	**10.71**	**0.00**	**10.71**
Total excluding contingencies	**27.23**	**18.14**	**45.37**	**5.05**	**50.42**
Contingencies	**2.72**	**1.82**	**4.54**	**0.51**	**5.05**
Total	**29.95**	**19.96**	**49.91**	**5.56**	**55.47**
Less amount included in 2004 budget	**1.00**[a]		**1.00**		
Net capital budget requirement	**28.95**	**19.96**	**48.91**		

ISTS II = Information Systems and Technology Strategy (2004–2009)

a The amount is distributed as follows: $300,000 for information systems initiatives, $477,000 for technology infrastructure initiatives, and $223,000 for information technology governance initiatives.

60. The capital expenditure budget will be implemented in two parts to ensure greater internal governance, allow time to build in-house capacity, and provide the opportunity to evaluate progress and reassess and better define the components of the second part. The first part will fund projects that are required at the start of the ISTS II, such as developing and completing the enterprise architecture, establishing the program management office, developing selected information systems, and implementing some of the technology infrastructure. While funding for some risk mitigation activities, such as integrated security management and the upgrade of the mainframe computer, have been included in the second part, these activities may need to be considered at an earlier time as appropriate. The second part will include developing the remaining information systems, including the program resource management system, and implementing the related technology infrastructure. The first part will

require a capital expenditure of $29.95 million (including the $1 million approved as part of the 2004 annual capital budget) and the second part is estimated to be $19.96 million. The use of the second part will be subject to management approval after a comprehensive review of the accomplishments.

61. Two projects will be funded from the capital budget for the loan accounting system: the portfolio administration and the procurement management systems. The projects relate directly to the administration and supervision of loans and TAs and therefore fall within the scope of the systems envisaged under that proposal. The projects are scheduled for implementation in 2007–2009 concurrently with part two projects.

62. Three components of the resource management initiative with a total estimated cost of $5.18 million are not funded under the ISTS II (para. 43): the budget management system ($2 million), the travel system ($0.42 million), and the consultant contract system ($1.5 million), plus the hardware and software cost for these systems ($1.26 million). Funding for these initiatives may be sought after a review of the progress of part one of the ISTS II, a redesign of business processes associated with the systems, and a reassessment of the capacity of ADB to start new projects in parallel with the other projects under implementation.

63. In addition to capital budget requirements, ISTS II investments will have an impact on ADB's annual administrative budget. The largest impact will be the annual depreciation charge (Appendix 4). The information systems will be amortized over 6 years from the date of commissioning while hardware, software, and other related expenses will be amortized over 4 years. Based on the proposed utilization schedule and the amortization rates for the components, the depreciation of ISTS II capital expenditures will have an additional annual resource implication of approximately 1% of the annual internal administrative expense budget. In any given year, the total depreciation charge associated with the ISTS II will not likely exceed 3% of the total projected annual internal administrative expense budget.

64. In addition to depreciation, hardware and software maintenance will be required to support the ISTS II initiatives. Current hardware and software maintenance costs may decrease as platforms are retired and replaced; however, the exact savings cannot be quantified now. While improvements in telecommunications processes and contracting arrangements will reduce the average cost of telecommunications services, such savings are likely to be more than compensated for by increasing demand for capacity.

65. Neither the sponsoring departments nor OIST have the professional staff resources to commit to full-time project management. Fixed-term staff positions, for a total of about 35 staff-years during 2004–2009 will be funded from the ISTS II capital budget. OIST will use 4 staff-years for enterprise architecture initiatives and 15 staff-years for the program management office. Six staff-years will be used as project leads in OIST and sponsoring departments for the knowledge management initiatives, and 10 staff-years for the project processing and portfolio management initiatives. In addition, existing staff members will need to work on the projects in OIST and in sponsoring departments. The cost of the existing staff member time has not been included in the capital cost estimates. The total existing staff time for implementation activities during the period is estimated at approximately 68 staff-years in OIST and 31 staff-years in the user departments.

B. Implementation Arrangements

1. Institutional Arrangements

66. The strategy will be implemented under the guidance of the IT Steering Committee and the ITC. The IT Steering Committee, which has endorsed the ISTS II, will review the strategy at least annually to ensure continued alignment with ADB's strategic objectives. The ITC will review implementation progress, prioritize activities in line with the objectives of the strategy, and provide input to the IT Steering Committee. OIST will be responsible for the delivery of the ISTS II. A program management office will be established in OIST to direct the implementation. The program management office will report to the principal director, OIST, and will coordinate the strategy, monitor the budget utilization and outputs, resolve issues across projects, address ADB-wide change management issues, develop communication plans, prepare periodic status reports, coordinate procurement and sourcing issues, and generally ensure integration of ISTS II projects. OIST and BPMSD will be jointly responsible for the cost effective implementation of the capital expenditure budget under the ISTS in full consultation with the ITC. The program management office will be headed by a director and include a change management officer, an enterprise architect, a technical architect, a data architect, and a budget and administrative officer. To ensure close coordination, the program management office will involve staff of the Knowledge Management Center in RSDD in its activities related to change management issues.

67. Implementation guidelines and financial controls for the ISTS II were prepared in consultation with BPMSD and approved by management. The guidelines incorporate the lessons learned from the ISTS. They provide procedures and approval levels for changes in project scope and cost estimates, budget reallocation, use of savings and contingencies, project addition, cancellation and suspension, procurement, and progress reporting. Flexibility will be built into project design to allow for changes in project scope and implementation arrangements arising from unexpected changes in circumstances during implementation. A change in project scope may require a reallocation of budget or use of contingencies, and involve a redesign or a contract renegotiation. The guidelines require that major changes be approved by the ITC. If cost estimates are revised, the ITC must consider whether the business case justifies the additional expenditure required to complete the project, and whether sufficient funds are available in the program contingency. The use of realized savings and contingencies will be strictly controlled. During project implementation, savings may occur when a project component is canceled or the final cost is lower than the estimates. The reallocation of savings to new or existing projects and the use of program contingencies to fund a cost overrun, a change in project scope, or new projects not envisaged at the time of ISTS II formulation will require the endorsement of the ITC; director general, BPMSD; and principal director, OIST.

68. One of the guiding principles of the strategy is the need for effective business sponsorship for each project. Sponsors have been clearly identified for all ISTS II projects. While OIST has the ultimate responsibility for implementing the ISTS II, the sponsors will take responsibility for the project from a business perspective. In particular, sponsors will be responsible for facilitating ADB-wide concurrence on business processes, data definitions, reporting formats, and other design and functionality issues. The sponsors will manage the process throughout implementation and ensure effective coordination between stakeholders. The sponsors will also ensure that business requirement changes related to new policies or initiatives are incorporated in the systems as soon as the requirements can be formulated. A distinction needs to be made between the sponsor and stakeholders. Stakeholders are

departments that are directly affected by a project, either from the perspective of associated business processes, or the information and reporting requirements.

69. Sponsors will be supported by project committees chaired by the head of the sponsoring departments and representing stakeholders. The project committee will be responsible for decisions regarding the effective implementation of the project, including reaching agreement on streamlining business processes, final approval of project design, and monitoring and reporting on project performance. For example the director general of one of the regional departments will head the project committee for the document repository project, which will include representatives of the major stakeholders, including the Knowledge Management Center, the Office of Administrative Services and other regional departments. The Knowledge Management Center will provide ADB-wide coordination and guidance to the sponsors of knowledge management initiatives on the minimum standards to be complied with. The project processing and portfolio management initiatives will also be sponsored by one of the regional departments and the project committee will include representatives from SPD, COSO, the Controller's Department and the other regional departments as major stakeholders. Table 2 lists sponsors of information systems projects.

Table 2: Information System Project Sponsors

Initiative		Sponsoring Department
1.	Knowledge Management	
	a. Document Repository	Mekong Department
	b. Smart Templates	Mekong Department
	c. Skills Knowledge Base	Central Operations Services Office
	d. Communities of Practice	Regional and Sustainable Development Department
	e. Internet and Intranet Harmonization	Office of External Relations
2.	Project Processing and Portfolio Management	
	a. Management Information System	Strategy and Policy Department
	b. Project Processing Management System	East and Central Asia Department
	c. Portfolio Monitoring and Management System	East and Central Asia Department
	d. Portfolio Administration System	South Asia and Controller's Departments
	e. Procurement Management System	South East Asia and Controller's Departments
3.	Program Resource Management System	Budget, Personnel and Management Systems Department
4.	Other Financial and Administrative Systems	Various

70. At the working level, project teams will be established comprising a functional lead from the sponsoring department and a technical lead from OIST to manage the day-to-day implementation of the projects. The teams will report on project progress and seek guidance from the project committee as required. The teams for larger projects will be supported by working groups comprising representatives from stakeholder departments. Technical teams consisting of OIST staff and consultants will be responsible for the detailed design, development, testing, and implementation of the systems from the technical perspective. As a rule, the project teams will report to the director of the program management office in OIST. Flexibility will be applied for smaller projects or in cases where the functional lead is not funded from the ISTS II budget. In such cases, the project team may report directly to the head of the sponsoring department.

2. Implementation Plan

71. Factors taken into consideration in determining the timing and sequencing of activities include the need to deliver benefits as quickly as possible, mitigate implementation risks, and spread the level of effort over the implementation period. Some activities need to start immediately and some preliminary work has begun. Efforts during the second half of 2004 will be focused on IT governance initiatives, with the establishment of the program management office in OIST, and the recruitment of fixed-term staff for the office and for other initiatives where provisions have been made for fixed-term staff, both in OIST and sponsoring departments. Program management activities will include a review of OIST procedures, an IT security and risk assessment, and the introduction of appropriate sourcing arrangements. The management information system will be developed under the sponsorship of SPD and work will start on the knowledge management initiative and enterprise architecture.

72. In 2005, immediate benefits will come from some projects. The new management information system will facilitate the preparation of reports for operations review meetings. The skills knowledge base and parts of the document repository will be delivered. The enterprise architecture and many features of the enterprise portal will be in place. The enterprise architecture is required prior to acquisition of any substantial infrastructure and development of major information systems, and will allow the project processing and portfolio management initiative to start. New telecommunication procedures and contractual arrangements will improve connectivity with resident missions, traveling staff, and external stakeholders.

73. In 2006 the project processing management system, the "communities of practice" systems, a more extensive document repository, and the ADB-wide portal will be implemented. Detailed implementation plans for each component of the project processing and portfolio management initiative will be prepared as part of the detailed design, with frequent deliverables and periodic reviews, and with due consideration to alternative sequencing approaches. A wireless network will be installed in selected areas at the headquarters. In 2007, the document repository will be completed, the smart templates and the portfolio monitoring and management systems delivered, and the Internet and intranet harmonization and operational data store projects implemented. The timing of the harmonization project will take into consideration the need for the enterprise architecture and the work program of the Office of External Relations

74. Work on the program resource management system will start when the requirements and associated business processes have been defined; the implementation is tentatively scheduled for 2008. The portfolio administration systems will be implemented in 2008 and the procurement management system in mid-2009. Development of other financial and administrative systems will be scheduled as needed during the period. The technology infrastructure initiatives will be tied mainly to technology developments and gradually implemented during the period. Servers needed for information systems will be acquired in accordance with the system development plans as part of the information system initiatives.

3. Review and monitoring

75. Strict cost control and monitoring mechanisms will be put in place to ensure adequate internal controls and oversight functions while maintaining a certain degree of flexibility in implementation as ADB operates in a dynamic environment with changing business needs. Separate guidelines for the use of the capital expenditure budget under ISTS II were developed to ensure appropriate controls and monitoring of each project component. The program management office to be established in OIST as part of the IT governance initiative will be

responsible for monitoring (i) performance against schedule and budget of all projects; (ii) management of risks, issues, and scope changes; (iii) resource allocation across projects; (iv) dependency between projects; and (v) the timely implementation of the recommendations from the independent validation and verification. Specific performance measures will be developed against which progress will be assessed, and performance will be reported to the IT Steering Committee and the ITC.

76. The ITC will meet as often as required, but at least quarterly. The program management office will provide reports to the ITC on the progress of implementation. OIST will review the ISTS II at the end of part one to assess performance, reconfirm the strategic objectives and priority of projects, obtain endorsement by Management for the use of part two funds, and review the capacity of ADB to absorb additional activities. A progress report at the end of the first part will be submitted to the Board for information.

4. Procurement Arrangements

77. Goods and services financed under the ISTS II will be procured following ADB's *Guidelines for Procurement* and *Guidelines on the Use of Consultants*. Streamlined procurement processes will be developed under the IT governance initiative in close cooperation with Office of Administrative Services and the Office of the General Counsel. The strategy provides for the use of considerable external consultant resources to assist in the implementation of initiatives and to undertake the information system development work. Funds have been allocated to determine the best sourcing approach for engaging external consultant resources.

C. Justification, Benefits, and Risks

1. Justification

78. ISTS II formulation started with an assessment of ADB's IT requirements. Once requirements were defined, several options for meeting the requirements were analyzed. The first option was to maintain the status quo and plan for minimal investments, simply to maintain network stability. This was found to be an unrealistic solution. Many of the older information systems are nearing the end of their useful lives. The systems have been enhanced and patched up many times and staff resources required to maintain them are better used for more productive activities. Moreover, as some of the technology platforms are ageing, maintenance and technical support becomes increasingly costly. Some of the older hardware and software platforms could break down and be difficult to repair. Furthermore, the systems are not meeting the requirements and the platforms on which they have been developed are not flexible enough to enable additional enhancements. Under this option, ADB's ability to track, maintain, and report on operations performance will deteriorate as systems become less adaptable to the changing environment.

79. Because the older, obsolete, and high maintenance systems must be replaced, three scenarios for meeting the ISTS II objectives were developed and analyzed, based on a list of investment projects compiled, evaluated, and prioritized by departments, OIST, and the ITC. The high-end scenario included a number of complex knowledge management systems, such as a full-fledged document management system that would provide collaborative tools for document creation, electronic transfer of documents, and version control. The high scenario included the acquisition of complex analytical and reporting tools. This scenario was rejected because of the perceived risks associated with the highly technical options being considered.

80. A low-cost scenario focused on investing the bare minimum needed to reduce the risks associated with the aging systems, use data integration technologies to integrate information in existing systems, and enhance reporting and analytical capabilities. While this would improve on the existing situation, the benefits would be inadequate to meet requirements, given the limitations of the existing systems. For example, the existing systems do not reflect the need for results-based management, the impact of the new organization structure, proposed changes to loan and TA classifications, and the requirements of the sector and thematic committees and networks. Furthermore, the low scenario did not provide for business process change or enhancements to existing information processing capability. The benefits from the low scenario would not justify the investment in capital and staff resources.

81. The initiatives included in the ISTS II are a mid-level scenario. They have been compiled following a process of prioritization and rationalization. Business needs were weighed against the cost of meeting those needs, the quality of existing systems support, the urgency for enhanced support to operations processes, and the implementation capacity of ADB. The initiatives were further prioritized to develop the implementation schedule. Projects were scheduled taking into consideration financial and capacity constraints; the capacity to manage a large multiyear investment program; and the capacity to design, develop, test, and implement the new systems. Project sponsors, OIST, and the ITC met to review the relative merits and to determine the scheduling priority. During the final prioritization process the decision was made to defer three of the systems related to resource management and to concentrate efforts on the knowledge management and project processing and portfolio management systems, as well as the core program resource management system.

2. Benefits

82. The issues being addressed by the ISTS II were raised by department representatives during the participatory formulation process. They were seen as having a serious impact on the conduct of their tasks and the quality of their output. Examples of current systems and processes that are impeding performance include the following: (i) the management information reporting at the regional department level can take up to 2 staff-days per department and usually involves overtime work by front office staff; (ii) quarterly preparation for the operation review meetings takes approximately 2 staff-months and involves staff from SPD, COSO, and each regional departments; and (iii) some simple inquiries on projects can only be addressed by looking through documents (for example, to list executing agencies for TA projects, one must actually revert to the TA papers). This situation is aggravated by the rigid structure of the existing systems, which means that changes to business processes or assistance modalities are difficult to accommodate. The full extent of changes required to support LIBOR-based loans, TA clusters, and the reorganization have not been possible within the structure of existing systems.

83. Another aspect of benefits is the opportunity cost of not implementing the ISTS II. ADB staff resources, particularly in operations areas, are stretched. The complexity associated with day-to-day business processes continues to increase. Staff members have expressed difficulty in coping with this complexity, particularly given the lack of IT-based tools that enhance productivity. A wealth of knowledge and information resides in ADB and in staff, but access to the information is difficult or nonexistent, particularly from resident missions and remote locations. The ISTS II will provide productivity tools to enable staff to respond to the challenges facing ADB and to continue to provide high quality services to DMCs.

84. During ISTS II formulation, several approaches were tried to establish a methodology to quantify the benefits and undertake a cost-benefit analysis. Industry experts were consulted, the experience of comparable organizations was considered, and ADB's own experience was taken into account. Quantification of benefits at this stage of program formulation would be subjective and would create expectations that may exceed final outcomes. In addition, in ADB's case, the absence of well-developed performance data for operations and IT service delivery further hampers a reliable and precise analysis of benefits. Consequently, possible quantification of benefits has been deferred until the start of each ISTS **I** component. At that stage, a business case will be prepared for the component together with performance measurement tools and techniques to assess the value and the expected benefits of the component. The current linkage exercise to determine resource requirements for ADB activities and the action plan on results will also help in establishing benchmarks against which internal efficiency gains from ISTS II initiatives can be measured.

85. Benefits are anticipated through easier and faster access to information, reduced time to carry out routine tasks and report preparation, further streamlining of business process, and less time for data analysis and disseminations. A detailed assessment of the benefits is presented in the following four areas: (i) services to stakeholders, (ii) effectiveness of operations, (iii) internal efficiency, and (iv) effectiveness of IT support. Qualitative benefits for each ISTS II initiative are also presented in Appendix 5.

86. **Services to Stakeholders.** All ADB stakeholders (including member countries, development and business partners, Management, and staff) need access to quality information. The ISTS II will address the needs of the stakeholders by providing collaborative tools to help create, cultivate, and disseminate knowledge across ADB departments and offices and between ADB and its external stakeholders. The data, information, and knowledge will be easily accessible to all. The ISTS II will increase the ability of ADB stakeholders to tap, exploit, and enrich this knowledge source. Processes associated with loan procurement and disbursement activities will be enhanced and streamlined through Internet-based transactions. The common Internet and intranet infrastructure will ensure maximum usability of ADB internal and external information and knowledge by many audiences. The document repository will increase the ability for ADB's stakeholders to easily search across the repository and retrieve required documents and relevant information. The collaborative solutions within the ISTS II will allow increased exchange of knowledge with other development organizations and will facilitate harmonization efforts.

87. **Operational Effectiveness.** The ISTS II will help ADB become a more results-oriented organization. It will allow for the automation of processes for most operations activities across ADB, based on a centralized database. A project management system based on a complete project lifecycle will allow systematic management and tracking of ADB projects. This new capability will enable faster and more effective transformation of accumulated data into quality information for better operating decisions. The knowledge management initiatives will allow simple and powerful search and retrieval of information by specific criteria through ad-hoc queries. The program resource management system will improve linkages between country programs and individual work programs, which will increase the reliability of planning and scheduling. The new systems will lead to stronger cross-departmental collaboration and will enhance ADB's ability to incorporate lessons learned and experience shared into its assistance programs.

88. **Internal Efficiency**. The ISTS II is not likely to result in savings in staff positions. The primary benefit of the ISTS II will be that less time will be required by staff in mundane tasks

associated with report preparation; research; and data access, entry, and reconciliation. This will provide more time for staff to analyze data and information, with corresponding improvements in effectiveness and quality of the analysis. Obtaining relevant documents and information for operations currently needing time, energy, and resources will become more straightforward and intuitive. The operational data store will allow automation of what is now a primarily manual process. The optimization of telecommunications will also enable more efficient access to information systems by field offices and traveling staff.

89. **IT Support Effectiveness.** As a result of improving effectiveness in OIST, ADB will be in a better position to leverage new technologies to strengthen support to operations. The benefits of the enterprise architecture will be lower costs, improved coordination between systems, and easier system maintenance. The enterprise architecture also promises simplification: multiple databases and information systems complicate life for staff and external stakeholders. The enterprise architecture enables system developers to create systems that work in a consistent manner and that work together effectively. The quality of the systems is increased because developers and users can work to a common business vision and common technical infrastructure. The rationalization of the telecommunications network will help avoid expenses by allowing a significant capacity increase with a minimum cost increase. The new user identification management tools will improve security.

3. Risks

90. The lessons of success and failure, in ADB and in comparators, have been analyzed. The risks of the proposed ISTS II were carefully reviewed internally and by external experts. The following risks could affect the implementation of the ISTS II:

(i) Although clear project sponsorship was established when the ISTS II was formulated, the commitment of some of the sponsors could wane, resulting in delays or in the cancellation of some projects. During annual reviews, the ITC will need to assess the sponsorship arrangements and take any measures necessary to reschedule projects or reallocate resources.

(ii) Complex project interdependencies could lead to implementation problems, as many of the projects depend on the successful implementation of other projects within the ISTS II. Difficulties with any of the key projects could disrupt the ISTS II implementation, resulting in delays and corresponding cost overruns. To mitigate this risk, the OIST program office will closely monitor implementation and conduct quarterly reviews to determine the need to take early corrective action, and reschedule projects or reallocate resources.

(iii) Some projects might encounter staff resistance to changing business processes, resulting in information systems that merely automate the existing processes and as a result do not meet all their objectives. Project sponsors will need to be aware of such situations and ensure early intervention.

(iv) Lengthy and cumbersome procurement processes could delay some projects. To address this risk, concerned departments will review procurement guidelines for IT equipment and services. The OIST program management office will closely monitor procurement activities to ensure early intervention in case of substantial delay in the procurement process.

(v) The ISTS II has been formulated based on existing technology. The impact of emerging technology over a 5-year period is difficult to predict. Because technology choices will change, annual reviews and reassessment will be needed to ensure that the solutions and prioritization for the following year remain valid.

91. The primary measure for mitigating the risks is the implementation of the IT governance initiative, in particular by establishing a program management office. The office will be responsible for monitoring the performance of each project, preparing reports for the ITC and to Management on the progress and implementation issues as they arise, and ensuring financial controls over expenditures. Should implementation difficulties be encountered by individual projects, they could be canceled or deferred as necessary to preserve the integrity of the program.

VI. CONCLUSION

92. ADB needs to build on the accomplishments of the ISTS and equip itself to face the challenges of the LTSF, the MTS, and the new agenda for managing for development results. The information systems and technology infrastructure must be improved to support the proposed knowledge management framework and to align the systems with the new organization structure. The proposed capital expenditure (i) will take into consideration the trends and opportunities in the IT industry, and (ii) is vital for ADB to continue its operations efficiently and in a cost-effective manner. The implementation of the ISTS II will benefit operational effectiveness, internal efficiency, services to external stakeholders, and the alignment of IT resources with business requirements. The risks associated with its implementation have been analyzed and are considered to be acceptable.

VII. RECOMMENDATION

93. It is recommended that the Board of Directors approve

(i) the proposed information systems and technology strategy for 2004–2009 (para. 26–58), and

(ii) a capital expenditure program amounting to $48.91 million for implementing the strategy (para. 59–65).

LEGACY SYSTEMS AND REPLACEMENT STATUS

Legacy System Name and Year of First Operations	Replacement Status or Plan
A. Project Pipeline And Portfolio	
1. Project Processing Information (1992)	Replacement in ISTS II (2006)
2. Project Administration (1995)	Replacement in ISTS II (2007)
3. Environment and Social Monitoring Information (1998)	Replacement in ISTS II (2006)
4. Post-Evaluation Information (1997)	Replacement in ISTS II (2006)
B. Portfolio Administration	
1. Loan Accounting (1982)	New loan accounting system for LBL (2004)
2. Loan Financial Information (1981)	Replacement in ISTS II (2008)
3. Private Sector (1991)	New loan accounting system for LBL (2004)
4. Technical Assistance Information (1984)	
a. TA portfolio administration	Replacement in ISTS II (2008)
b. TA consultant contract management	Replacement after ISTS II
C. Treasury And Finance	
1. Banking Transaction Processing (1997)	
a. HR and procurement transactions	Replaced with Oracle (2002)
b. Other transactions	Replacement in ISTS II (2008)
2. General Ledger Accounting (1983)	
a. General Ledger, HR and procurement accounts	Replaced with Oracle (2002)
b. Other accounts	Replacement in ISTS II (2008)
3. Administrative Expense (1983)	Replacement after ISTS II
4. Resident Mission Accounting (1996)	Replacement in ISTS II (to be scheduled)
D. Resource Management	
1. Budget Monitoring (1991)	Replacement after ISTS II
2. Program Resource Management (1992)	Replacement in ISTS II (2008)
3. Travel (1992)	Replacement after ISTS II
4. Staff Consultant (1984)	Replacement after ISTS II
E. Human Resources	
1. Personnel Management Information (1982)	Replaced with Oracle (2002)
2. Recruitment and Selection (1990)	Replaced with Oracle (2002)
3. Benefit Administration (1983)	Partly replaced with Oracle (2002)
4. Payroll (1989)	Replaced with Oracle (2002)
5. Staff Retirement (1993)	Replaced with Oracle (2002)
6. Leave Administration (1990)	To be replaced with Oracle (2004)
7. Housing Loans (1991)	To be replaced with Oracle (2004)
F. Administration	
1. Property Management (1992)	Replaced with Oracle (2002)
2. Service Contract Administration (1996)	Replaced with Oracle (2002)
3. Shipment Monitoring (1996)	Replacement in ISTS II (to be scheduled)

HR=human resources, ISTS II=Information Systems and Technology Strategy (2004–2009), LBL=LIBOR-based loan, LIBOR=London Interbank offered rate; TA=technical assistance

INFORMATION SYSTEMS AND TECHNOLOGY STRATEGY (1998–2002) ACCOMPLISHMENTS

1. In October 1998, the Board approved the 1998–2002 Information Systems and Technology Strategy (ISTS) supported by a capital expenditure program of $29.8 million. A midterm review of the progress was presented to the Board in May 2001. This appendix describes the accomplishments and lessons learned from implementing the strategy.

A. Financial Status

2. Table A2 summarizes the ISTS components funded under the capital expenditure budget and shows the amounts committed and a brief summary of the status of physical implementation of each component as of 31 March 2004. As of that date, $29.271 million had been disbursed or committed.

B. Accomplishments

1. Information Systems for Operations Needs

3. A number of information systems focused on operations were improved or converted to a more effective client-server platform in 1998–1999, including a management information system for operations review, a project processing information system that manages data on the loan and technical assistance processing cycle, and an environment and social development information system. The original plan was for Office of Information Systems and Technology (OIST) staff to develop a travel system during the ISTS period. However, due to the need for a full review of the related business processes, this project was deferred to a later period.

4. Several document repository systems have been implemented since 1998. Most of these systems are accessible from the intranet. A powerful search facility was acquired for use on the Internet and intranet sites to enable users to search for information across all the document repositories. Document repositories currently available to staff on the intranet include project-specific documents such as project appraisal, project completion, project performance audit, and environment impact assessment reports; and policy papers and administrative documents. A repository of Board documents was made available in electronic format to facilitate the delivery of Board documents under consideration to member countries. A needs assessment and a pilot system for one office were completed to understand ADB's document management requirements. Results from these efforts were used to formulate the knowledge management initiatives of the ISTS II.

Table A2: ISTS Status of Implementation as of 31 March 2004

($ million)

ISTS Initiatives	Budget		Committed	Balance	Status of Implementation
	Initial	Revised			
A. Information Systems for Operations Needs					
1. Systems Under Development					
a. Management Information System	0.000				Completed
b. Project Processing Information	0.000				Completed
c. Environmental and Social Development System	0.000				Completed
d. Travel System	0.000				Deferred
2. New Operations Systems Document Management Systems	0.300	0.300	0.298	0.002	Completed
B. Replacement of Mainframe-based Information Systems					
1. Finance and Human Resources Management Information System (INTEGRA)	14.200	11.251	11.251	0.000	Completed.
2. SWIFT Replacement	0.230	0.230	0.222	0.008	Completed.
3. Treasury Risk Management System	1.400	4.000	4.000	0.000	2004 completion; $600,000 potential funds available
C. Technology Infrastructure					
1. Network Infrastructure	3.006	3.006	3.002	0.004	Completed
2. Network, Security, and Backup Servers	3.581	4.090	4.028	0.062	Completed. Additional servers in 2004
3. Enterprise Server (for INTEGRA)	1.500	1.500	1.500	0.000	Completed
4. Integrated Network Management	2.261	2.261	2.063	0.198	2004 completion
5. Integrated Backup Systems	0.762	0.762	0.761	0.001	Completed
6. Network Security Systems	0.393	0.393	0.392	0.001	Completed
7. Technology Standards and Methods	0.300	0.300	0.290	0.010	Completed
8. Uninterrupted Power Supply	0.470	0.310	0.298	0.012	Completed.
D. Management Infrastructure					
1. Business Continuity Plan	0.600	0.600	0.605	(0.005)	Completed
E. Production and Delivery of Informational Materials					
1. Digital Media System	0.090	0.230	0.230	0.000	Completed
2. Television Studio	0.500	0.100	0.085	0.015	2004 completion
3. Media Archive Systems	0.150	0.070	0.043	0.027	2004 completion
4. Briefing Theater Upgrade	0.100	0.200	0.000	0.200	2004 completion
5. Internet and Intranet	0.000	0.120	0.119	0.001	2004 completion
6. Public Information Center	0.000	0.120	0.084	0.036	2004 completion
Total	**29.843**	**29.843**	**29.271**	**0.572**	

ISTS=Information systems and Technology Strategy (1998-2002), SWIFT= Society for Worldwide Interbank Financial Telecommunications

2. Replacement of Mainframe-Based Information Systems

a. Finance and Human Resources Management Information System

5. The finance and human resources management information system project, also known as the INTEGRA project, was the largest component of the ISTS. The Oracle applications implemented under the project were designed to improve the productivity and quality of information at the Asian Development Bank (ADB), to facilitate the review and redesign of its business processes based on leading practices available with enterprise software, and eventually to replace the legacy systems running on the mainframe platform. The original scope of the project included three integrated modules: a human resources and payroll module, a finance module, and an operations module. The human resource and payroll module supports personnel management, staff training, benefits, payroll, and salary administration. The finance module incorporates core financial activities, internal procurement, treasury and banking, and management reporting. The two modules use commercially available software, with some customization.

6. The functional fit of the operations module was assessed in 2001 to determine the extent to which the Oracle application software could meet ADB's operations requirements. The resulting conclusion was that significantly more customization would be required to ensure that ADB's business requirements would be met, than had been provided for when the contract was signed. The complexity and sophistication of the requirements had not been sufficiently understood at the time the contract was awarded. As a result, the decision was made in 2002 to remove the operations module from INTEGRA.

7. Project implementation was supervised by a project management unit reporting directly to the vice-president (finance and administration). Project guidance was provided by an executive steering committee with representatives of departments affected by the project and a project implementation committee made up of representatives of departments directly involved in project implementation. Oracle's project implementation and management teams worked with the project management unit. A number of ADB working groups were established to help ADB and Oracle implement the project.

8. The contract for software, hardware, and implementation services was awarded in late 1999. Activities in 2000 and 2001 included installing the Oracle application servers, reviewing and designing the new business processes for the three modules, setting up the package to fit the redesigned processes, and developing customized modules to meet unique needs where required. The human resource and payroll and finance modules started operating in June 2002. The Oracle contract was completed in November 2002 after a 6-month post-implementation support period. Activities in 2003 included fixing unresolved problems, enhancing system functionality, and stabilizing system operations.

9. The total amount committed as of 31 March 2004 for the project was $16.1 million. The capital cost for the project during this period was $12.8 million, consisting of $7.5 million for the Oracle package, including licenses and implementation services, $1.6 million for the enterprise server, $2.6 million for the project management staff costs, and $1.1 million for services required after the implementation period and during the system stabilization phase.

b. Electronic Fund Transfer System

10. The Society for Worldwide Interbank Financial Telecommunications (SWIFT) electronic fund transfer system was moved to the new SWIFT Alliance Access software in 2000. This was necessary as SWIFT was about to cease support for the old software and ADB was having difficulty arranging maintenance contracts for the hardware, which was becoming obsolete. As part of the move, new hardware and software was purchased and installed and access security was enhanced. The SWIFT network was connected to the main ADB network and protected to ensure that only authorized users had access. Local and offshore backup sites were upgraded and tested to support the new software. Overall, the move has increased the system's integrity and security and improved staff efficiency by enabling payment instructions to be processed from a single work station.

c. Treasury Risk Management System

11. The objective of the system is to provide ADB with a tool to measure the degree of market, credit, and other risk exposures associated with treasury activities, e.g., investments and borrowings. The system will also help maximize return on investments without exceeding the limit of ADB's aggregate risk tolerance. The following has been completed toward implementing the systems: a request for proposal has been prepared and issued, vendors' responses have been evaluated, the system has been demonstrated, core requirements have been identified and final specifications issued, financial proposals have been evaluated, pilot testing has been done, the software package has been selected, the contract has been signed, work stations have been delivered and installed, and users have been trained. After final testing of the system, integrating the risk management function with the back-office operations proved to be too complex given the resource constraint for regular system support and operation. ADB and the vendor therefore agreed to modify the scope and focus on risk management rather than back-office integration. The system is expected to be operating in 2004.

3. Reliable and Cost-Effective Technology Infrastructure

a. Servers

12. New high-capacity servers were replaced at the headquarters to replace old ones that were obsolete and of insufficient capacity for ADB's needs. The new servers allowed the information systems to be expanded and new Internet, intranet, and Lotus Notes-based applications to be installed. The number of servers used for file and print services, E-mail, and Lotus Notes databases was reduced, thus improving manageability. High capacity servers were also installed for Internet and intranet systems and for Oracle applications. Disk storage capacity was substantially increased to accommodate the increased number of E-mail messages, user files, and document databases.

b. Network Infrastructure

13. The local area network at the headquarters was upgraded with the installation of high-speed vertical fiber optics and faster network equipment. This has allowed the network to accommodate the increase in E-mail and Internet traffic, and will provide adequate capacity for new systems.

c. Network Services

14. Upgraded servers and network infrastructure have allowed ADB to introduce new network services, including Internet access for all staff, backup Internet connections to ensure uninterrupted service, an enhanced new E-mail system, remote and secure network access during mission travel and from homes in Manila, and videoconferencing facilities in the headquarters and in 15 field offices. An integrated network management system will be implemented in 2004 to allow the main components of the network and related IT services to be managed from a central location, thus facilitating improved performance and availability of the network.

d. Uninterrupted Power Supply

15. New uninterrupted power supply (UPS) equipment was acquired. Two large units were installed, tested, and commissioned for the computer center and smaller units for the building's core UPS system. The UPS operates in conjunction with the electrical system to provide backup power protection and power distribution to critical services.

4. Business Continuity Plan

16. As part of the ADB emergency management plan, contingency plans have been in place for years to handle any major disruption of computer services. The contingency plans rely on backup sites in Manila and Hong Kong to restart operations in case of disaster. The plans have been adjusted and expanded to accommodate Oracle applications. While the plans cannot cover all risks, they provide basic relief should the computer center at headquarters become inoperable. In addition, extensive plans were developed and tested and procedures implemented for year 2000 (Y2K) contingencies. Two projects were completed to enhance the business continuity plan. The first was the development of a strategy for ADB's telecommunications facilities that would provide for alternative routing of telecommunications between resident missions and headquarters and protect against the failure of individual links. The second was acquisition of hardware and software for a pilot information portal. A portal is a set of technology tools that allows access to information services through an easy-to-use personalized intranet page on a web browser with consistent presentation interfaces, using a single user name and password, and from any computer connected to the Internet anywhere in the world.

5. Preparation and Dissemination of Information Materials

17. ADB's proactive media outreach strategy was supported by initiatives such as the on-line media briefing center and the enhancement of the ADB web site and public information centers. The ISTS projects were realigned to support these initiatives and take advantage of technological advances. New digital cameras and video editing and photographic equipment were acquired to support multimedia production, and print and electronic publication. A digital media archive system was developed. The briefing theater is being renovated into a modern facility for delivering high quality presentations supported by multimedia.

18. New systems for video projection, audio, lighting, videoconferencing, and automated controls were acquired to improve the quality and delivery of the presentations. The ADB website was revamped with new hardware and software and now has about 400,000 visits per month. A new web server and multimedia work station will be installed in 2004 to upgrade the technical infrastructure to support web site content management and operations. The public

information centers in headquarters and in selected resident missions and representative offices are being upgraded with new work stations that will function as multimedia information kiosks. An Internet-based media briefing center will be established to support ADB's media outreach strategy and provide a fast, timely, and cost-effective way to package and distribute news about ADB.

C. Benefits

19. The ISTS has resulted in qualitative and productivity improvements. Full and fast Internet access by staff has significantly broadened the information base used for research. Better and faster communication links with resident missions and representative offices have increased their capability to disseminate information about ADB. The ADB web site has allowed ADB to promote its strategic objectives and its image as a key tool for economic development in the region, by providing up-to-date information to the public and marketing ADB publications. General productivity gains have also resulted from a range of new facilities such as faster computers; better peripherals such as printers, scanners, and storage devices; document repository systems; the intranet; videoconferencing; new productivity tools; and remote access to the network during missions.

20. As a result of the INTEGRA project, business processes have been streamlined in the human resources, payroll, and internal administrative expense accounting areas. Oracle applications for these areas have provided more efficient formats of data entry and retrieval, and easier access to relevant data than the previous systems. As the system is fully integrated with a central database architecture, human resource and financial data are captured into the applications only once, at the source, which ensures integrity and consistency, and facilitates consolidated data analysis and reporting. The self-service and workflow technologies of the applications facilitate automation of business processes such as routing of transactions for review and approval without paper copies. The ad-hoc reporting tools empower users to be self-sufficient in generating accurate information in a timely manner, and the analytical tools enable users to perform faster and more sophisticated analysis of data than was previously possible. Further improvements in productivity and quality of information will be realized gradually, as the newly implemented applications stabilize and users become more familiar with the new systems and related business processes. In the end, the Oracle applications implemented to support the finance and human resources areas provide a solid software platform on which to built new integrated information systems.

INDICATIVE IMPLEMENTATION SCHEDULE

Initiatives and Components	Budget $ million	2004		2005				2006				2007				2008				2009	
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
A. Information Systems Initiatives																					
1. Knowledge Management							↑				↑										
a. Document Repository	2.230																				
b. Smart Templates	0.400																				
c. Skills Knowledge Base	0.260																				
d. Communities of Practice	1.110																				
e. Internet and Intranet Harmonization	1.430																				
2. Project Processing and Portfolio Management																					
a. Management Information	0.250																				
b. Project Processing Management	1.570																				
c. Portfolio Monitoring and Management	2.100																				
d. Portfolio Administration	1.590																				
e. Procurement Management	2.290																				
3. Program Resource Management System	1.320																				
4. Other Financial and Administrative Systems	0.700																				
5. Hardware and Software for Information Systems	4.140																				
Summary of delivered systems by year				Management information system; document repository I; skills knowledge base;				Document repository II communities of practice; project processing management				Final document repository; smart templates; portfolio monitoring and management; Internet and intranet harmonization				Portfolio administration; resource program management				Procurement management	

Legend: Planning, preparation, and acquision; Development, implementation and execution; Post implementation support; Interim delivery ↑

Initiatives and Components	Budget $ million	2004		2005				2006				2007				2008				2009	
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
6. Enterprise Architecture																					
a. Enterprise Architecture Development	2.990																				
b. Enterprise Portal	3.490																				
c. Operational Data Store	1.470																				
B. Technology Infrastructure Initiatives																					
1. Data Network Improvement																					
a. Network Management	3.310																				
b. Wireless Network	0.390																				
2. Server Consolidation and Upgrade																					
a. E-mail Server Upgrades	1.400																				
b. Server Upgrades and Consolidation	5.050																				
3. Telecommunications Network Improvement																					
a. Telecommunications Contracts and Procedures	0.880																				
b. Telephone and Videoconferencing Equipment Upgrade	1.340																				
C. Information Technology Governance Initiatives																					
1. Program and Project Management	3.970																				
2. Information Technology Security	4.660																				
3. Information Technology Service Improvement	1.380																				
4. Independent Validation and Verification	0.700																				
Program Contingency	5.040																				
Total	**55.460**																				
		Program management office in place; security scope study		Enterprise architecture in place; new telecommunications arrangements				Enterprise portal; wireless network in selected areas; information technology service improvements in place				Operational data store; e-mail servers upgraded; improved network management				Servers upgraded and consolidated; telephone equipment upgraded					

Legend: Planning, preparation, and acquision; Development, implementation and execution; Post implementation support

DEPRECIATION SCHEDULE

A. Assumptions

1. The major impact of the Information Systems and Technology Strategy (2004-2009) on the administrative budget will be through projected increases in the annual depreciation. The assumptions considered in the projection of the depreciation impact are:

(i) the major initiatives were grouped into five depreciation categories, Information Systems, Information System Hardware, Enterprise Architecture, Technology Infrastructure, and Information Technology Governance;

(ii) information systems are depreciated on a straight line basis over a 6-year period; the remaining depreciation categories are depreciated on a straight line basis over a 4-year period; and

(iii) assets will be transferred to fixed assets gradually, as new systems are implemented and technologies deployed: the projected capitalization pattern (based on expenditure and commissioning of assets) is provided in Table A4.1.

Table A4.1: Asset Capitalization
($ million)

Initiatives	2004	2005	2006	2007	2008	2009	Total
Information systems	1.16	2.32	2.32	2.32	1.74	1.74	11.60
Information systems hardware	0.42	0.84	0.84	0.84	0.63	0.63	4.20
Enterprise architecture	1.75	2.18	2.18	1.75	0.87	0.00	8.73
Technology infrastructure	1.36	2.72	2.72	2.72	2.04	2.04	13.60
Information technology governance	2.90	2.35	2.36	2.36	1.25	0.56	11.78
Total	**7.59**	**10.41**	**10.42**	**9.99**	**6.53**	**4.97**	**49.91**

B. Depreciation Schedule

2. Based on the assumptions, the projected impact on the annual depreciation charge is shown in Table A4.2.

Table A4.2: Projected Depreciation
($ million)

Initiatives	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Systems	0.19	0.58	0.97	1.35	1.64	1.93	1.74	1.35	0.97	0.58	0.30	11.60
Hardware	0.11	0.32	0.53	0.74	0.79	0.74	0.53	0.32	0.12	0.00	0.00	4.20
Architecture	0.44	0.98	1.53	1.97	1.75	1.20	0.66	0.20	0.00	0.00	0.00	8.73
Infrastructure	0.34	1.02	1.70	2.38	2.55	2.38	1.70	1.02	0.51	0.00	0.00	13.60
Governance	0.74	1.31	1.90	2.49	2.08	1.63	1.04	0.45	0.14	0.00	0.00	11.78
Total	**1.82**	**4.21**	**6.63**	**8.93**	**8.81**	**7.88**	**5.67**	**3.34**	**1.74**	**0.58**	**0.30**	**49.91**

SUMMARY OF BENEFITS

Initiatives And Components	Benefits
A. Information Systems Initiatives	
1. Knowledge Management	Support for the implementation of the knowledge management framework and the public communications policy Help introduce a knowledge sharing culture and making the Asian Development Bank (ADB) a learning organization
a. Document Repository	Straightforward and intuitive facility to search across a large number of documents and retrieve relevant information, resulting in increased efficiency for staff and external stakeholders Better quality of research due to improved access to relevant data (e.g., technical assistance consultant and back-to-office reports) Ability to electronically share documents with stakeholders Improved service to developing member countries
b. Smart Templates	Improved consistency and quality of reports and documents produced by ADB Efficient search and retrieval of information, leading to staff time savings
c. Skills Knowledge Base	Access to available skills resulting in reduced project processing time and faster implementation
d. Communities of Practice	Required by the new thematic committees and networks created as a result of the reorganization Mechanisms to share and disseminate information within ADB and between ADB and external stakeholders Increased participation of stakeholders such as nongovernment organizations Enhanced transparency and accountability
e. Internet and Intranet Harmonization	Reduce significantly time spent for transferring documents and information among internal and external websites Efficient electronic publication of documents and information with unified content management Increased exchange of knowledge and collaboration with other organizations
2. Project Processing and Portfolio Management	Improved quality, accuracy, and timeliness of information System-generated indicators for results-based management Avoidance of high cost of maintenance for aging systems currently in use
a. Management Information System	More efficient and timely preparation of reports for quarterly operations review meetings
b. Project Processing Management System	Reduced time spent by staff for data access, entry and reconciliation, and generation of reports
c. Portfolio Monitoring and Management System	More systematic management and tracking of ADB projects Generation of results-based performance indicators

Initiatives And Components	Benefits
d. Portfolio Administration System	Enhanced loan administration and disbursement processes through internet-based transactions, resulting in higher efficiencies for executing agencies, regional departments, and Controller's Department Efficient and timely preparation of relevant reports by users
e. Procurement Management System	Enhanced procurement approval processes through internet-based transactions, resulting in higher efficiency of executing agencies, regional departments, Central Operations Services Office, and Controller's Department Efficient preparation of relevant reports by users
3. Program Resource Management System	Better linkage between inputs and outputs resulting in more efficient resource management and allocation Generation of indicators for result-based management and organizational performance
4. Other Financial and Administrative Systems	Benefits to be identified as specific projects are formulated
5. Hardware and Software for Information Systems	See items A1-3
6. Enterprise Architecture	More effective management of information technology (IT) resources
a. Enterprise Architecture Development	Reduced resource requirements for systems support and maintenance through standardization Simplification and harmonization of the systems Improved communication among sponsors and developers, resulting in better quality systems Better control of IT infrastructure cost
b. Enterprise Portal	Access to relevant information anytime, anywhere by staff and external stakeholders such as member countries, executing agencies, development and business partners, and nongovernmental organizations Efficient and secure information access with the use of a single password and personalized user interface Increased flexibility in introducing new systems and services
c. Operational Data Store	Consistent information available to staff and stakeholders Effective transformation of accumulated data into quality information
B. Technology Infrastructure Initiatives	Reduced cost of maintenance of aging equipment Reduced downtime due to potential equipment breakdown Enhanced reliability of IT services Elimination of obsolete equipment that are no longer serviceable
1. Data Network Improvement	Enhanced network efficiency and security Improved network flexibility in selected areas through the use of wireless technology

Initiatives And Components	Benefits
2. Server Consolidation and Upgrade	Efficient and secure computer equipment necessary to run systems in headquarters and resident missions Support and maintenance cost reduced due to fewer IT platforms
3. Telecommunications Network Improvement	Improved access to ADB information by resident missions, traveling staff, and external stakeholders More reliable videoconference links Significant additional capacity with minimal increase of cost
C. Information Technology Governance Initiatives	
1. Program and Project Management	Increased focus on results and business value of IT initiatives through stringent controls Consistent reviews, monitoring, change management, and reporting procedures during implementation Improved coordination and communication between sponsors and the Office of Information Systems and Technology, resulting in better decision-making Timely identification, coordination and escalation of issues to the appropriate level, as needed
2. Information Technology Security	Improved protection of ADB information assets from external threats Improved defense against computer virus attacks, malicious intrusion, and offensive e-mail
3. Information Technology Service Improvement	Responsive and reliable IT services through the introduction of service level agreements Established IT performance measurement and reporting Better leveraging of new technologies to strengthen IT support to ADB operations
4. Independent Validation and Verification	External review resulting in improved IT governance and program management Early identification and escalation of potential issues and problems leading to timely corrective actions