Existing Information Systems Assessment

Project: [Project Name]

Project Number: [Project #]

Author:
Creation date:
Last updated:
Document number:
Version:

Approvals:

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1 Introduction

Guideline 2
The Introduction section provides an overview of the Assessment Document. It is not necessary to enter any particular information at this point.

1.1 Purpose of this document
Describe what are the purpose and the scope of the assessment. Declare out-of-scope activities, if any.

Guideline 2.1
The purpose of this document is usually to provide a systematic approach in performing existing systems assessment. The results of this assessment may serve to identify weaknesses of the existing systems and initiate improvement activities.

Define:
- The context of the study (Master Plan, Feasibility Study etc) and the purpose of the assessment.
- The systems to be assessed.
- Relevant objectives and goals as precisely as possible.

1.2 Audience
Describe the primary and secondary audiences of the assessment.

1.3 References
List any documents referenced to create this Assessment document.

Guideline 2.3
Usually these documents include:
- Any document about the Organization’s structure and functions.
- Any document about the Organization’s Information System strategy.
- Any existing documentation about hardware / software / data / telecommunications inventory.

<Refer to “ICT – Maintenance” document for a discussion about hardware / software / telecommunications inventory>

1.4 Overview of Document
Describe what the document contains and how it is organized.

Guideline 2.4
The minimum contents of the Assessment document are:
- Assessment of Current Applications.
- Assessment of Current Data Collections.
- Assessment of Current Information Technology
- Conclusions
- Short-term IS Improvement Plan
1.5 Preparing for the Assessment

Before starting the Assessment task, it is recommended to do the following:

- Gather information about the Organization. Obtain an organization chart (and, if possible, a detailed one for the IS unit).
- Ask for the Organization's master Plan (if any).
- Ask for the IS Master Plan (if any).
- Ask for any existing inventories (software, hardware, data collections, and telecoms).
## 2 Current Applications Overview and Assessment

### Guideline 3

The Current Applications Assessment section provides:
- An overview of the current Applications.
- The Assessment of them.

It is not necessary to enter any particular information at this point.

## 2.1 Overview of current Applications

### 2.1.1 Current applications identification

Provide a list of the major applications.

### Guideline 3.1.1

The list should not be limited to applications developed and managed by the IS directorate/department. User-developed applications usually indicate information requirements that cannot be met by production systems. Consider applications under development, in production, and those developed by users as the current application list is compiled.

### 2.1.2 Current applications definition

Describe the major characteristics of each application including purpose, scope, and status.

### Guideline 3.1.2

Use available documentation to define as many of these properties as possible, but at a minimum, define the following:
- The scope of the application
- The application's purpose
- The security features of the application
- The key persons responsible for the use and maintenance of the application
- The applications status in production and development
- A preliminary assessment of the available documentation
- The age of the application
- The obsolescence or immaturity of the application's supporting technology (if appropriate)

Some of the information above should be present in the Software Inventory.  
<Refer to “ICT – Maintenance” document for a discussion about software inventory>

### 2.1.3 Current Applications associations

Develop association matrices to describe the users and locations of these applications and their relationship with data collections.

### Guideline 3.1.3

Develop the following associations:
- Application-to-Organizational Unit
- Application-to-Geographical Location
- Current Application-to-Current Data Collection
- Current Application-to-Functional Area

These matrices are essential as migration strategies are developed.
## 2.2 Current Applications’ Quality Features

### Guideline 3.2

This section provides an overview of the Applications quality features
It is not necessary to enter any information at this point

### 2.2.1 History

#### Guideline 3.2.1

Address the following:
- Is the original analysis/design/programming team still available or involved with the support of the application?
- When was the application first requested, by whom, and with what justification or intent?
- When was the application first installed, and when did it reach its current level of use?
- What is the coverage in terms of both location and function?

### 2.2.2 Potential future development

#### Guideline 3.2.2

Address the following:
- What growth pattern exists for the system, and what is being done to react to this?
- What major and minor enhancements are planned for the application, and when is the next release scheduled?
- What justification or reason was put forward with each enhancement request?

### 2.2.3 Stability/reliability

#### Guideline 3.2.3

Address the following:
- What has been the maintenance and enhancement history of the application, and where are the change history records for it?
- What justification or reason was put forward with each enhancement request?
- What problems has the application encountered since it was installed?

### 2.2.4 Maintainability / Enhancements

#### Guideline 3.2.4

Address the following:
- Does the application have modular design?
- Are modules cohesive, with low coupling?
- Is the documentation complete and up to date?
- Is expertise available in-house to support the solution?
2.2.5 Technological Obsolescence Assessment

**Guideline 3.2.4**

Address the following:

- Is the application technologically current?
- If not, what problems does this create?
- When is a replacement for the application planned?

2.3 Current Applications Assessment

2.3.1 User assessment and ranking

Summarize the users' perception of each application with respect to ease of use, accessibility, appropriateness, functionality, reliability, and maintainability. Summarize the user's assessment of the likely future prospects for each application.

**Guideline 3.3.1**

The methodology form performing application's survey is described in ANNEX I.

For the users' assessment, indicate if they find the current application:

- Usable as is
- Usable with modification
- Needing replacement
- Usable temporarily

2.3.2 Information needs' assessment

Identify where information needs are not satisfied.

**Guideline 3.3.2**

If time, do this via developing a Current Application-to-Information Need association matrix. Indicate, in the appropriate cells, the degree of support the application provides to the information need.

2.3.3 Applications' security assessment

Assess the security features of the applications by describing the degree to which each application meets a predefined set of security criteria.

**Guideline 3.3.3**

*Refer to “ICT Software Applications” document for a description of the software security features*

2.3.4 Summary Assessment

Develop a summary assessment for each application and/or module.

2.3.5 Overall Applications' Portfolio Assessment
Review the summaries of each application assessment and develop a complete assessment of the enterprise's applications portfolio.

**Guideline 3.3.5**

Consider the age of the portfolio. Develop a functional versus technical satisfaction matrix. If time permits, conduct a survey of similar organizations in the same industry or marketplace to construct a profile of their use of information systems. Compare this profile to the Current Application Portfolio to identify any anomalies that may impact the enterprise. Document any recommendations from the comparison.

### 2.3.6 Current application-related opportunities and problems.

Identify applications that consistently experience problems and develop recommendations concerning their disposition. Identify any mismatches between applications and business processes.

Define the opportunity/problems in the knowledge base and associate them with the application(s) concerned, via the current Application-to-Opportunity/Problem association.

Review the Organization and resources (including Management escalation) responsible for the system support.
3 Current Data Collections Overview and Assessment

Guideline 4
In this section, identify the existing data collections that contain a majority of the critical data. Describe each data collection in terms of associated applications, processor configurations, data management technology, and geographical location usage. Assess each data collection with respect to currency, integrity, completeness, and performance. Develop recommendations for resolving problems and realizing opportunities.

It's not necessary to enter any particular information at this point.

3.1 Data Inventory Overview

3.1.1 Data collections identification.
Identify the major repositories of data.

Guideline 4.1.1
Use the current application profiles and application documentation to assist in this. Do not omit major manual data collections.
Only consider permanent data collections that serve a majority of the information needs. Temporary data sets should be overlooked.

3.1.2 Data collections’ description
Provide a detailed description of the data collection(s)

Guideline 4.1.2
Minimum information includes:
- General Description
- Type of data collection
- Application(s) creating, updating, and reading the data collection
- Interactions with other systems (import – export of data)
- Retention policies
- Backup – restore / offsite remedial
- Security policies
- Storage location(s)
- Data management technology used
- Frequency of use
- Volume of information

This information may be found in a number of places, including:
- Automatic scheduler software
- Production control procedure manual
- Librarian
- Security profiles
- Data model or database design document
- Data dictionaries
- Application specifications
- Disaster recovery plans
### Guideline 4.1.2

**Contingency plans**

### 3.1.3 Entity model views

This section contains (for each data collection) the major entities identification and description, as well as their major attributes (if applicable).

#### Guideline 4.1.3

- Review the file structure of each data collection to identify specific groups of information that qualify as entities.
- Develop an accurate definition for each entity that describes its business purpose, meaning, and policy. List any aliases that may be known.
- Identify and define the major attributes of each entity. At a minimum, define the identifier(s) for each entity.
- Put the information above in an Appendix if voluminous.
- In case that this documentation already exists in updated form (as a result of system design or maintenance activities) you may omit the detailed description and indicate the source of information.

### 3.1.4 Entity – relationship models

Identify the major relationships between entities. Define the option rules and cardinality constraints that apply to each relationship.

Develop an entity model view that illustrates the entities and their relationships for each data collection.

This section is not applicable in case of hardcopies or non-structured data.

#### Guideline 4.1.4

In an ideal world, a data model would be available for each current, automated data collection. However, in practice many data collections do not have such models. This may be because their development predated data modelling concepts, or the original model was not maintained. Or, the data collection may be part of a package, and the vendor has elected not to share such a model with its user base.

Extracting a data model from a file organization or database schema is not an exact science, since it requires the database design process to be reversed. Use an approach such as the following:

- Consider each file or table to be a candidate entity
- Combine candidate entities whose corresponding files or tables share the same key
- Eliminate candidate entities corresponding to system-related data (e.g., a table of valid users)
- Use foreign key links, or use owner/member pointers in network DBMSs, to infer one-to-many relationships
- Examine screen edit rules to determine business rules, and reflect these rules in entity relationships, where appropriate
Guideline 4.1.4

- Eliminate redundancy in the model by applying the principles of normalization

Put the information above in an Appendix if voluminous.

In case that this documentation already exists in updated form (as a result of system design or maintenance activities) you may omit the detailed description and indicate the source of information.

3.2 Data Collection Portfolio Assessment

Assess each current data collection with respect to data currency, integrity, redundancy, structure completeness, and access performance.

Guideline 4.2

Consider the following:
- **Currency.** How closely does the data held match the real-time, current data?
- **Integrity.** How accurate is the data? Are there any inconsistencies?
- **Redundancy.** Is key enterprise data created and updated by multiple applications? Do user files maintain an inordinate amount of extracted data?
- **Structure.** Is the data normalized?
- **Completeness.** Is the data collection complete in terms of the number of records held?
- **Performance.** Does the mechanism support the users’ efficient access of data?
- ** Appropriateness.** Is the data stored but never used?
- **Accessibility.** Is the data accessible to the users who need it?
- **Security.** Are there sufficient standards and procedures in place to ensure data security?

Not all of the information above is applicable in case of manual or non-structured data.

Develop an assessment of the likely future disposition of each data collection. The data collection may be used:
- As is
- With enhancement
- Needs replacement

If it should be replaced, could it be a source for automated data conversion?

3.3 Data Collection Integration Assessment

Assess the extent of data sharing amongst applications.

Guideline 4.3.A

To do this, review the Application-to-Data Collection association. Is critical enterprise data shared effectively? Effective data management should focus on the 20% of enterprise data used by 80% of the applications.

This section is not applicable in case of manual data
Identify the organizational, procedural, or technological factors that inhibit data sharing in the enterprise.

Assess the adequacy of the physical mechanisms used to share data.

**Guideline 4.3.B**

Various mechanisms may be used to share data amongst applications, such as batch data transfers, use of a common database, re-keying and application program calls to multiple databases. Consider the following as appropriate:

- The timeliness of data transfers, and hence the overall synchronization of data
- The controls that exist to administer and monitor data access across databases
- The recovery mechanisms that exist to cater for failure of data sharing procedures which update multiple physical databases with the same data
- The desirability of mechanisms used (for example is an existing network run more efficiently by using it for file transfers rather than file access)
- The desirability of re-keying and the associated error-rates
- The effective management of data held redundantly to facilitate data sharing
- The extent to which the current application development methodology adequately addresses and encourages the development of a highly data-shared environment

### 3.4 Overall data collection portfolio assessment.

This section contains the summary of the state of the overall data collection portfolio.

**Guideline 4.4**

Consider the age of the portfolio and the individual assessments of each data collection.

### 3.5 Data collection-related opportunities and problems.

Identify opportunities and problems resulting from this analysis and develop recommendations. Associate them with the application(s) concerned.
4 Current Information Technology Overview and Assessment

Guideline 5

In this section, identify existing technology components such as computers, communication networks, hardware components, and related systems software. Assess each component for reliability, performance, upgradeability, and other key measures that may indicate deficiencies in the IS environment. Analyze each assessment to determine its impact on the business unit. Assess IS facilities to determine if they adequately support the IS staff and computer hardware requirements.

It’s not necessary to enter any particular information at this point.

4.1 Information Technology components overview

4.1.1 Hardware Inventory

This section contains an overview of the Hardware Inventory.

Guideline 5.1.1

<Refer to “ICT Maintenance” document for a description of the hardware inventory>

Provide a summarized view of it (e.g. it is not necessary to mention every PC separately, but group them on geographical location, type and characteristics)

Provide additional information about MTBF and costs

Put the information above in an Appendix if voluminous.

In case that this documentation already exists in updated form (as a result of maintenance activities) you may omit the detailed description and indicate the source of information.

4.1.2 Telecommunications Inventory

This section contains an overview of the telecommunications Inventory.

Guideline 5.1.2

<Refer to “ICT Maintenance” document for a description of the telecommunications inventory>.

Provide additional information about MTBF and costs

Put the information above in an Appendix if voluminous.

In case that this documentation already exists in updated form (as a result of maintenance activities) you may omit the detailed description and indicate the source of information.

4.1.3 System Software Inventory

This section contains an overview of the System Software Inventory.

Guideline 5.1.3

<Refer to “ICT Maintenance” document for a description of the software inventory>. This reference includes both application and system software. Distinguish the system software
Guideline 5.1.3

items, such as:
- Operating systems (e.g., Unix, MS Windows xxx, DOS)
- Transaction processing monitors (e.g., IMS/DC, CICS)
- Corporate encyclopaedias or repositories
- Data dictionary packages (e.g., IBM DDD, Data Manager)
- DBMS packages (e.g., IMS/DB, DB2, Oracle)
- Communications software packages (e.g., NetView)
- Utilities
- Language compilers
- Computer-aided software engineering tools
- Virus detection software
- Programmer workbench software etc

Provide additional information about MTBF and costs

Put the information above in an Appendix if voluminous.

In case that this documentation already exists in updated form (as a result of maintenance activities) you may omit the detailed description and indicate the source of information.

4.2 Information Technology Components Assessment

This section contains the assessment of each communications network, hardware component, and system software component.

Guideline 5

Assess each component with respect to:
- Suitability to tasks
- Security
- Reliability
- Performance
- Available capacity
- Upgradeability
- Costs/financial commitment
- Uptime/response time
- Technical obsolescence

Consult with technology experts to gain an appreciation of technology trends affecting the enterprise's industry. Information gained through this type of interaction will usually help the team identify technology solutions that otherwise would have been overlooked.

Consult with the technology component vendors to gain insight into their product directions. Use the vendors supplying the current components (e.g., hardware, system software, communications) to gain insight into their currently available technology and the future direction of their products. Use the resources to educate the team on the trends each vendor identifies.

4.3 Overall Technology Environment Assessment

This section contains the following assessments:
Guideline 5.3A
Identify any significant variations and attempt to explain the reasons for those variations. There may be sound reasons for not having the latest available technology.

Guideline 5.3B
For example, hardware and system deficiencies may affect the performance of the whole processor configuration or communications network; deficiencies or problems in the processor configuration and communications networks may affect the performance of the applications.

4.4 Technology component-related opportunities and problems.
This section contains a concise statement (from the technical perspective) of strengths, weaknesses, and recommendations regarding the technology portfolio.

Guideline 5.4
Review the strengths and weaknesses identified while assessing each major technology component.

Develop a matrix that plots each major component versus its technical obsolescence.

Identify major gaps where the technology does not appear adequate for the needs of the enterprise.
5 Business Evaluation of Current Systems

Guideline 6

This section contains a review of the technology assessment, survey responses, and strategy session feedback packages to identify the impact that current technology and applications are having on the business.

It is not necessary to enter any information at this point.

This section contains a review of the technology assessment, survey responses, and strategy session feedback packages to identify the impact that current technology and applications are having on the business.

5.1 Risks and issues related to the business

This section describes the impact that current technology is having on the business.

Guideline 6.1

Review the technology assessment, survey responses, and strategy session feedback packages.

Review the financial impact revenue - expenditure of each organizational unit within the business.

Document the risks and issues that result from these impacts as they relate to the business.

5.2 Evaluation results

This section contains the final existing Information Systems evaluation results.

Guideline 6.2

Assemble a business evaluation of the current technical environment.

- Review the list of strengths, weaknesses, opportunities, and problems relating to the current technology.
- The survey responses will also help provide the users' perceptions of how well the technology satisfies the business needs.
- Determine what effects these characteristics might have on the missions, goals, objectives, and strategies of the Organization's or business segments. Identify where the current technology portfolio already has a competitive advantage or can be leveraged more effectively.

For example, if every knowledge worker in the Organization has a workstation but cannot effectively use it, proper training may better leverage the technology investment.
6 Short-term IS Improvement Plan

This section contains:

- The description of short-term improvements may be necessary to stabilize the current information system environment.
- The determination of their benefits and costs.

Guideline 7

This section is an optional one. You may omit it if improvement proposals are not in the scope of your assignment.

The section deals only with short term improvements, in order to take a direct advantage of the knowledge acquired by the assessor. Long-term improvements require further planning.

It is not necessary to enter any information at this point.

6.1 Immediate problems description

Guideline 7.1

Identify the immediate opportunity/problems associated with the information systems environment. These problems are usually critical and have a major impact on the business.

Review the opportunity/problems related to technology components, IS management policies and practices, and data collections as well as applications.

Concentrate on urgent fixes. Identify projects that are urgent "fixes"—only those that must be addressed immediately and that can begin immediately.

This actions may (and actual should) include tasks aiming to improve:

- IS facilities
- IS Unit Management and skills

6.2 Feasibility of short-term actions.

Guideline 7.2

Assess the possibility of short-term actions to address these problems.

Short-term is defined as the next three months. Actions that are too complex to be addressed in this time frame or that may have cost or resource limitations should be addressed in Tactical or Strategic Information Systems Plans.

6.3 Short-term IS improvement projects.

Guideline 5.4

For each project develop:

- A cost estimation
- Resource estimation
- Key issues,
- Major risks’ mitigation techniques
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<td>Prioritize the projects.</td>
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7 Appendices

The following appendixes should be included in the existing systems assessment document:

- **Appendix I**: Applications Inventory
- **Appendix II**: Data Inventory
- **Appendix III**: Hardware Inventory
- **Appendix IV**: Telecommunications Inventory
- **Appendix V**: System Software Inventory

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8 ANNEX I: Sample Applications Survey Methodology

8.1 Determine the questioning style.

Structure questions so that the alternatives provided are meaningful, and so that you can generalize from the number of respondents attracted to each alternative. Consider:

- Using questions which offer yes/no, good/bad, true/false, or right/wrong answers.
- Using multiple-choice questions, which offer fixed alternative answers.
- Presenting a list of items to be ranked by the respondent. For example, the most valued characteristics of an application, such as reliability, output presentation, data security, etc.
- Presenting a collection of paired alternatives and inviting selection. For example: Which do you rely on more, summary reporting or detail reporting?
- Asking for scaled responses. For example: How satisfied are you with the system's ability to meet your needs?
  - 10 - completely satisfied
  - 5 - marginally satisfied
  - 1 - completely dissatisfied

8.2 Develop the user survey.

Develop questions that measure the users' satisfaction with each application. The user survey should be developed to answer at least the following questions about each application:

- **Business impact**: What is the impact of the system to the business in terms of significance, finance, image etc?
- **Ease of Use**: Is the application easy to use, easy to learn, and well-documented?
- **Accessibility**: Is access to the application available to all who need it at the places they need it?
- ** Appropriateness**: Is the application appropriate to the needs of the business process it supports?
- **Availability**: Is the application available when it is needed?
- **Functionality**: Is all the required functionality present, in terms of tasks supported and data items used or available?
- **Reliability**: Is the application reliable, accurate, and current? Is the performance of the application adequate for the use to which it is put?
- ** Maintainability**: Is the application regularly and smoothly enhanced to match changes in the business need? Is there a reliable and familiar way to get help with problems? Is there a reliable and familiar way for users to influence the enhancement and development process?
- **Response time**: Are the users satisfied with the response time they receive at their terminals?

8.3 Identify the users to participate in the survey.

Obtain a list of users for each application (e.g., a password list) and select a sample to participate in the survey. Select users with significant experience with the application and/or business, and include both hands-on users and those who have management responsibility for the area supported by the
application. The size of the sample depends on the complexity of the application and the size of the user population; two to ten may be used as a guide.

8.4 Develop the IS survey.

Develop questions geared to obtaining information about the technical characteristics, history, and likely prospects of applications within the current portfolio. The IS survey should be developed to address at least the following topics concerning each application:

- **Application Overview.** Is the original analysis/design/programming team still available or involved with the support of the application? When was the application first requested, by whom, and with what justification or intent? When was the application first installed, and when did it reach its current level of use? What is the coverage in terms of both location and function?

- **Potential Future Development.** What growth pattern exists for the system, and what is being done to react to this? What major and minor enhancements are planned for the application, and when is the next release scheduled? What justification or reason was put forward with each enhancement request?

- **Stability/Reliability.** What has been the maintenance and enhancement history of the application, and where are the change history records for it? What justification or reason was put forward with each enhancement request? What problems has the application encountered since it was installed?

- **Maintainability/Enhancements.** Does the application have modular design? Are modules cohesive, with low coupling?

- **Technological Obsolescence Assessment.** Is the application technologically current? If not, what problems does this create? When is a replacement for the application planned?

8.5 Identify the IS staff to participate in the survey.

Obtain a list of IS unit staff who have a knowledge of the various applications. The list may include representatives of system development, computer operations, and database administration. Select a small number for each application (two to four, depending on the size of the application) to participate in the survey.

8.6 Distribute the survey.

Send the survey to the appropriate participants or arrange individual interviews. Plan to interview a number of respondents to confirm their replies.

8.7 Gather the survey responses.

Gather the completed surveys or conduct interviews with the participants. Summarize the survey responses and assemble the interview notes.

8.8 Previous / historic surveys.

Make use of the Internet to access survey questionnaires such as Gartner etc.