Institutional and Sector Modernisation Facility

ICT Standards

ICT Feasibility Study

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1 Document control

1.1 List of Abbreviations

Abbreviation	Description
HR	Human Resources
ISMF	Institutional and Sector Modernisation Facility
MoCT	Ministry of Communications and Technology

1.2 Purpose of this Document

This document aims at defining the structure and contents of ICT Feasibility Studies for the introduction of new ICT systems within a well-defined framework.

2 Introduction

After presenting the Purpose of the document, the Audience to which it is addressed and the documents referenced within it, a brief overview and rationale of the subjects dealt with in the Feasibility Study presented:

- Project description;
- Assessment criteria;
- Feasibility ranking;

Guideline 2
The Introduction should stress the point that the Feasibility Study provides strong – but not irrefutable – indication on the appropriateness of the assumptions and approaches proposed in the ICT project under consideration and may highlight project planning areas that need further elaboration.
Since a Feasibility Study could need a considerable amount of time to be elaborated (e.g. six months), it tends to be a project by itself, so it must be carefully prepared and organized in terms of cost and resources needed. The Project Manager should also decide about the competence of the resources needed (e.g. Security Expert, Financial Expert, Statistician etc).

Note: Pre-Feasibility Study

A pre-feasibility study may be conducted first to help establish relevant scenarios. Before proceeding with detailed feasibility study, one may want to do some rough pre-feasibility analysis. If it indicates early-on that the proposed business idea is not feasible, it will save everyone time and money. If the findings justify the full feasibility study, this preliminary work may have resolved some basic issues.
The pre-feasibility study must ensure that a plan is presented to the management for decision on the need and resources – budget availability to perform the Feasibility Study.

2.1 Purpose of this document

Describe what are the purpose and the scope of the ICT Feasibility Study.

Guideline 2.1
The purpose of a Feasibility Study is to provide the decision-making authority of an Organisation with the necessary documentation from which it can be safely deduced that the ICT project being considered can indeed be implemented, financed and operated (over a specified time-horizon) as planned.
Conducting a feasibility study can be an expensive and time consuming process. Of course, not doing a feasibility analysis can be even more expensive in terms of mistaken decisions and ensuing costs. However, before deciding on the conduction of a feasibility study, it is important to have a clearly defined outline of one or more alternative models or scenarios that must be explored. Sufficient initial investigation of these alternatives must have been conducted to determine if they have the potential of being viable, in order to avoid the cost and delay of investigating ideas that may be determined as not feasible by a few simple considerations.
A useful feasibility study is one that: - Is understandable and easy to read,

Guideline 2.1
❑ Addresses all of the relevant issues and questions, ❑ Lists and discusses all of the underlying assumptions of the project analysis, ❑ Meets the expectations of the project committee, ❑ Is logically consistent within sections and among sections, ❑ Is thoroughly researched using good research techniques, ❑ Contains all of the relevant information, and ❑ Meets the conditions of the consulting contract (when it is assigned to an external consultant).

2.2 Audience

Describe the primary and secondary audiences of the ICT FS.

2.3 References

List any documents referenced to create this ICT FS document.

Guideline 2.3
Usually these documents include: ❑ The ICT Master Plan of the Organisation, in which the needs to be covered by the projected ICT system will be defined. ❑ The Business Plan of the Organisation, for information concerning the available financial and HR resources over time. ❑ Any macroeconomic documents that help define the wider economic context of the project, such as expected inflation rate, cost of money etc. ❑ Any studies about the areas of the business to be automated.

2.4 Overview of Document

Describe what the document contains and how it is organised.

Guideline 2.4
Define: ❑ The functional dimension of the project (needs that the project intends to cover) ❑ The technical dimension of the project (technologies and approach used) ❑ Two distinct phases: Implementation and Operation. For each, first state the expected duration (i.e. time needed to implement the project and expected useful life-time), then consider: a. The financial dimension (cost of implementation, expected benefits and costs over the specified time-period) b. The operational dimension (availability of required pre-requisites, expected perturbation of the operation of the Organisation during the project implementation and until its full integration) c. Business benefits for automation d. The organisational dimension (special organisational needs for each phase)

Guideline 2.4
e. The HR dimension (people, know-how and skills needed for each phase). f. The business benefits vs. financial costs
In accordance with the above, the minimum contents of the ICT FS document are (beyond the Executive Summary): ❑ Problem Statement ❑ Requirements Statement ❑ Project description ❑ Available alternatives (if applicable, at least two options should be presented) ❑ Feasibility Assessment ❑ Appendix
<*Justify any deviations of the above contents as appropriate*>

3 Executive Summary

This chapter is intended to give a rapid understanding of the main points of the ICT FS document. It should contain a very brief description of the Problem (or Opportunity) Statement plus a list of the reasons justifying the adopted choices (or the recommendations for alternative choices) in the functional, technical, financial, organisational and HR domains.

Guideline 3
The Executive Summary should discuss the 'why' of a proposed choice only if it is different from the initial planning. Otherwise, it should confirm, preferably in a quantitative way, the suitability of the choices in the various domains, eventually pointing out major risks or areas of doubt.

3.1 Problem or Opportunity Statement

Guideline 3.1
State what is the situation or event and outline the particular reasons that triggered the project under consideration (e.g. urgent need to establish effective control over the financial data of the Organisation, or approval of a long-term development programme). Define the planning period (the overall period over which al kinds of benefits and costs are evaluated).

3.2 Functional Desirability and Feasibility

List the main functionality that the new ICT system is expected to offer, correlating it with the Problem Statement above. Mention the features of the system that make such functionality possible (e.g. the use of a high-speed Wide Area Network (WAN) will allow on-line sharing of data).

3.3 Technical feasibility

Show that the main technical features of the system (architecture, total processing power, total storage space, type and number of workstations, operating environment, user interface etc) can, in principle, provide the desired functionality and are within the current possibilities of the market (i.e. they can be implemented through components that either exist already, or are expected to be available very soon).
List also the constraints of the required systems in terms of:

- Time to market;
- Critical success factors;

Guideline 3.3
The purpose of this section is to guarantee that the design of the system is realistic and not based upon vague notions of components that are not yet fully developed.

3.4 Financial feasibility

State the expected cost of the implementation of the system (procurement of equipment, procurement or development of software applications, installation / activation of telecommunication lines, possibly computer room configuration, training etc) and the spread of payments over time (usually there is an initial down payment, while the remaining amount is paid in ore or more instalments associated with specific project milestones).

Guideline 3.4
List the expected cost of operation over the whole planning period, plus the expected financial benefits from the system's operation and calculate the present value of the system. If additional external revenues are needed, describe the probable sources.

3.5 Operational feasibility

List the required conditions that must be satisfied for the system to be implemented and for its activation.

Guideline 3.5
Normally, prerequisites for operation are more demanding than the ones for implementation. Typical **implementation phase** prerequisites might be: ❑ Legal framework: Are there any new laws that need to be established, in order to allow the development of the system? ❑ Regulatory framework: Are there any regulations, internal to the Organisation, that need to be amended in order e.g. to allow the personnel to participate in workgroups that may be needed in the various sub-phases of the implementation (specification of needs, system testing, pilot operation,…)? ❑ Physical site arrangements: Are the sites where the system units shall be installed ready to receive them? Is there enough space? Are the environmental conditions appropriate? Is there enough power available? Are there communication lines of sufficient capacity? Has cabling been installed to cover the local communication needs? On the other hand, typical **operation phase** prerequisites often include: ❑ Legal framework: Are there any new laws or regulations that need to be established, in order to allow the operation of the system? ❑ Regulatory framework: Are there any amendments to internal regulations needed e.g. in order to enhance the capability of the IT department so as to effectively manage the new system? ❑ Contractual obligations: Are there any existing contracts that need to be terminated before the new system's kick-off? ❑ Operational prerequisites: Are there initial data to be loaded before actual system start-up? Will a period of 'parallel operation' (new system and procedures alongside the existing ones) be needed? If the new system fails, is there a contingency plan that allows rolling back to the previous state of affairs? Is it possible to train the prospective users in such a way that the operation of the Organisation will not suffer appreciably? Who will provide users with assistance?

3.6 Organisational feasibility

State the organisational changes that will be needed during each of the two main phases of the project (Implementation / Operation).

Guideline 3.6
More specifically, during the Implementation phase a project management scheme will be needed, in order to monitor and control the project's execution and to provide the contractor with any information required for the design and development of the system. During the operation phase, an appropriate organisational structure must exist, which will have the responsibility for the operation, administration and technical support of the system. In many cases this structure is based on an already existing ICT department, which however will often need some enhancement, especially if the new system is significantly larger and more complex than existing ones.
Refer to "ICT Project Management" document and "ICT Introductory document" for a detailed description of the project management schemes.

3.7 HR feasibility

Are there any needs for additional personnel?
Is there a need to upgrade the level of knowledge and skills of the existing personnel, in order to guarantee smooth system operation?
Are there any internal HR movements that have to be initiated in due time, so that the right people will be where needed, when needed?

4 Problem Statement

First, describe the business environment which contains the business problem (or opportunity).

Guideline 4
Take into account: ❑ the external environment (e.g. products and services available, technology and commercial or operational trends, statutory or legislative changes); ❑ the business vision, strategy or objectives; ❑ the business organisation (e.g. units relevant to this project, internal communication lines), and ❑ the business processes (e.g. procurement, supply chain management, IT systems, HR management, strategic planning, finance/accounting, manufacturing/logistics, engineering). Then: ❑ provide a full description of the core problem (or opportunity); ❑ refer to the reasons why the problem exists (or provide support evidence that the opportunity exists); ❑ describe the impact it is having on the business (or the positive impact that the realisation of the opportunity will have); ❑ state the timeframes within which it must be resolved (or for which the opportunity will likely exist); ❑ Refer to the financial impact;

5 Requirements Statement

List the key business drivers for this project (e.g. changes to legislative framework, a particular citizens' need that must be covered within a certain period, limited timeframe for the absorption of external funds). For each business problem (or opportunity), describe the detailed business requirements (e.g. training of employees in the new procedures, establishment of a new business unit, 20% increase in the existing capacity of the national data transmission network, etc).

6 Project description

Provide a detailed description of the project under consideration. The description should include at least the following:

❑ The specific project objectives.

Guideline 6.1
Project objectives should be aligned to the general strategic goals of the Organisation. Ii addition, if the project is to be funded within the framework of a more general programme, its objectives should comply to those of the programme

❑ The project scope and main activities

Guideline 6.2

Guideline 6.2
The project may include the procurement of goods and/or the provision of services and/or the construction of works. Each component should be clearly stated, in order to provide a full picture of what is intended to be done. In case of provision of services, the description of activities should include the expected end products or deliverables of each activity.

- Time frame: When is the project scheduled to start, when it should be completed and eventual intermediate milestones.

Guideline 6.3
A graphic representation (Gantt chart) is very useful to provide a concise representation of the temporal dimension of a project. In addition, it offers an easy and intuitive depiction of most common dependencies between internal project tasks as well as from and to external events and conditions. Only the main tasks and events should appear in this section. Too many details are not needed at this point and will only create clutter and confusion. Since the starting date of a project may not be definitive at this point, it might be useful to present the Gantt chart in relative terms (e.g. in months from project start, instead of absolute dates).

- Cost elements: What is the project budget, how it is expected to be spread over the project's duration (e.g. partial payments after the certified achievement of each milestone), what are the available funding sources.

Guideline 6.4
Payment dates should appear as milestones, either in tabular form, or, if a graphic representation is used, as appropriate marks on the Gantt chart. Partial payments are often expressed as percentages of the total project budget. This gives a feeling of easier control of their fair distribution over time, which should more or less correspond to the overall project progress. A final payment should be scheduled after the contracting authority takes definitive delivery of the system, so that the contractor is not tempted to change course before the project completion.

7 Available alternatives

A Feasibility Study does not aim to propose and evaluate alternative solutions to the main problem being solved by the project under consideration. This selection should have taken place in an earlier phase. Yet, other possible approaches that have been examined and rejected should be briefly reviewed, in order to:

- Confirm the superiority of the selected solution to the alternatives available and
- Offer the possibility to fine tune some minor points of the project. If the feasibility study reveals some design weaknesses, alternative approaches may provide ideas for improvement.

Each solution option must be presented using the same general structure, but more briefly than the actual proposed project, along with a short description of their strong and weak points.

Guideline 7
Instead of presenting the Project and the alternative solutions in separate chapters, it is also acceptable to combine the descriptions component by component: In this case the proposed solution by component is first presented, followed by the available alternative solutions and a comparison of the pros and cons of each, justifying the proposed choice.
You could also identify quick hit projects (which allow for more impact in less time).

8 Feasibility Assessment

8.1 Definition of Criteria

List the criteria used to judge the feasibility of the project.

Guideline 8.1.A
In case where alternative options are examined, list the criteria used to rank them. Some criteria will be of the on/off type, i.e. if the criterion is not satisfied then the solution should be rejected. This is often the case of criteria having to do with system implementation financing or HR availability. Failure to satisfy these will normally 'kill' a project before it even starts. However, normally such fundamental issues should have been detected and settled before a formal feasibility study is conducted, so in the following we consider that criteria are only of the 'gradable' type (i.e. they can be graded on a suitable scale, usually from 0 to 100). In any case, some criteria will be more important than others. This is reflected in a 'relative weight' that is assigned to each.

In the following, we first examine several types (or classes) of feasibility criteria, while in the next paragraph (8.2) we take a closer look at the procedure of evaluating, or grading, the feasibility of a project.

Guideline 8.1.B
Although several evaluation criteria are generic, i.e. they can be applied to a variety of projects, it is often possible to 'customise' them, i.e. to adapt them to the particular conditions prevailing in the case under study. This will clearly provide a much more realistic evaluation for the specific situation and project being examined.

8.1.1 Functional Desirability and Feasibility

- Does the project offer functionality that covers the stated needs of the Organisation?
  a. What percentage of functions will be supported by the system?
     i. Core functions
     ii. Auxiliary functions
  b. What is the degree of support offered?
     i. Full automation – the operator needs only to provide the minimum necessary input and the system carries on the whole function
     ii. Critical support – the system executes the main/most difficult steps, freeing the user from tedious tasks such as searching into archive material or performing complicated calculations
     iii. 'Secretarial support' – e.g. the system prints empty or filled-in forms

c. What ‘nice-to-have’ features will also be offered?
    i. Data validation upon entry may be viewed either as an essential requirement, or as a desirable help and be graded accordingly.
    ii. Some security checks may also be offered beyond the absolutely necessary ones.

- ❑ Is the user interface well adapted to the environment of the Organisation?
    d. Compatibility of the user interface with eventual earlier applications in use in the Organisation is a plus that can significantly ease the introduction and acceptance of the system by the users.
    e. Compatibility with other applications being implemented within the Organisation or installed in external agencies with which there is frequent exchange of information may also be helpful
- ❑ How is the system expected to respond to future challenges:
    f. Architecture: Is it sufficiently flexible to accommodate possible future needs that differ from today’s?
    g. Hardware: Can the processing power, storage space etc be increased to handle increased requirements?
    h. System software: Is it sufficiently up-to-date to reasonably ensure that it will be supported during the project’s whole lifetime?
    i. Application software: Have measures been taken to make it maintainable? (use of structured development methods, availability of source documents,…)

Summarize the business benefits.

8.1.2 Technical feasibility

This section should try to answer convincingly the question: ‘Can it be built?’. The following more specific questions may help in this direction.

- ❑ Are the technologies proposed commercially available? If not, when are they expected to be? With what degree of certainty? How safe is it considered to use them?
- ❑ Does the system use any proprietary technologies? If so, how critical is the ensuing dependence from a specific manufacturer?
- ❑ Are the components needed to build the system commercially available?
- ❑ Does the know-how required to implement and operate the system exist on the local market?
- ❑ Are there any features of the system that are not suited to the particular requirements of the project? (e.g. if 24 hours operation is needed, can the system function properly? If the system needs precisely controlled environmental conditions, can these be secured?)
- ❑ Is the infrastructure appropriate to support the system operation (e.g. are the communication lines of sufficient capacity to carry the data traffic at the required speed and quality levels?)

8.1.3 Financial feasibility

This section should try to answer convincingly the question: ‘Will there be enough money through the system’s lifetime?’. The following more specific questions may help in this direction.

- ❑ What is the cost of implementation of the system?
- ❑ What is the annual cost of operation of the system?
- ❑ What are the expected financial benefits from the system operation (direct and indirect)?

- Have the financial resources needed to implement the project been found?
- How will the eventual difference (cost – benefit) be financed after the system is in operation?
- If the cost goes up during implementation (a quite common phenomenon!) or the available resources 'dry-up', what will happen? Will the project stop? Will it be possible to at least partially exploit the unfinished system? Could additional (back-up) financial resources be found?
- Will the system retain some value after the end of the planning period? How can this be exploited?

The next three paragraphs address important issues related not to the project itself, but rather to the environment into which the system will have to be integrated.

8.1.4 Operational feasibility

It is useful to consider separately the operational requirements of the implementation and the operation phase.
Typical **implementation phase** prerequisites might be:

- Legal framework: Are there any new laws that need to be established, in order to allow the development of the system?
- Regulatory framework: Are there any regulations, internal to the Organisation, that need to be amended in order e.g. to allow the personnel to participate in workgroups that may be needed in the various sub-phases of the implementation (specification of needs, system testing, pilot operation,…)?
- What level of participation from the Organisation's personnel is expected during the implementation phase? How seriously will the Organisation's normal functioning be impaired by the decrease in employee time available for the usual operations?
- Are there any preparation activities needed during the implementation phase? Will these too interfere with 'normal business'? consider for instance the necessary physical site arrangements: Are the sites where the system units shall be installed ready to receive them? Is there enough space? Are the environmental conditions appropriate? Is there enough power available? Are there communication lines of sufficient capacity? Has cabling been installed to cover the local communication needs?
- Can the training of the users be conducted in such a way as not to excessively drain the different organisational units from employees for long time periods? Would it be possible or preferable to temporarily close-down some units during training time instead of having them operate at fractional capacity?

On the other hand, typical **operation phase** prerequisites often include:

- Legal framework: Are there any new laws or regulations that need to be established, in order to allow the operation of the system?
- Regulatory framework: Are there any amendments to internal regulations needed e.g. in order to enhance the capability of the IT department so as to effectively manage the new system?
- Contractual obligations: Are there any existing contracts that need to be terminated before the new system's kick-off?
- Operational prerequisites:
    j. Are there initial data to be loaded before actual system start-up? Can its total volume be estimated? In what form is it available? (electronic, paper,…). How reliable, complete and retrievable is it? (e.g. is it stored in old paper documents possibly partly

destroyed or made illegible by age?) Who is expected to plan, perform, monitor and verify this data migration operation?

k. Will a period of 'parallel operation' (new system and procedures alongside the existing ones) be needed? If the new system fails, is there a contingency plan that allows rolling back to the previous state of affairs? I

l. Who will provide users with assistance?

- Will it be possible / advisable to have a 'parallel run' period after the initial system start-up or will the new system immediately replace the old one? If major trouble arises from the application of the new system, will it be possible to roll-it back and revert to the previous state of affairs?
- How is the new system expected to be introduced? Will the total system functionality be available from the beginning to all users? Will there be a functional and/or 'geographical' gradual roll-out? Does the system structure (both hardware and application architectures) allow/dictate such a phased activation of functions? Is it desirable?
- Data entry: Will extensive data entry be needed during normal system operation? (i.e. beyond the initial phase-in period). What is the expected volume of data entry? Who is going to perform it? Have the cost and time needed been calculated?
- Data retention requirements, information storage and retrieval procedures. Can the system respect the functional and quantitative requirements concerning archival data?

8.1.5 Organisational feasibility

- Is the current organisational structure able to provide the necessary support during the implementation phase? How can a managing scheme for the project be crafted out of this structure and effectively interface with it?
- Will the system's introduction create new needs that cannot be accommodated by the current organisational structure?
- Is it possible to plan and implement all needed organisational changes in time, so as not to delay the system's implementation and operation?

8.1.6 HR feasibility

- What are the HR requirements during the two main phases (implementation and operation)? Is considerable HR involvement needed, or will the system be implemented and operated with minimal participation of the Organisation's personnel?
- Is it possible to find the necessary people at the various phases of the project: to provide information and know-how during the design phase, to test and approve the solution when completed, to operate the system when installed and put in operation? What is the upgrading of current knowledge and skills that is expected to be needed, both in terms of 'quantity' (number of people in various categories) and 'quality' (types of new skills to be acquired)?
- Are there any administrative obstacles expected to the needed interventions at HR level? If yes, what approaches – if any – can be used to overcome them?

8.1.7 Risks

A brief Risk Analysis should be included in a Feasibility Study, since a project might be feasible, and yet its implementation and/or operation might face so serious risks that it would

be better to avoid the 'adventure' in spite of the benefits that it might generate if successfully completed. Therefore the question 'What are the risks for each of the points dealt with in the above analysis? ' is crucial and should be carefully examined.
Risks must be roughly quantified by assigning them 1) a probability of occurrence and 2) a probable cost if they occur. The total level of risk associated with the project (and its alternative solutions) may be assessed by adding the products of these quantities over all risks considered.
The risk considerations may be integrated in the feasibility assessment of the project, or be presented as a separate item.

8.2 Application of Criteria

Guideline 8.2
This section may be omitted in case where no alternative options are considered.

The following general approach can be used to calculate an overall feasibility rating for the project and its alternatives:

- Criteria are grouped, in the classes outlined in the previous paragraph (8.1).
- To each class a relative **Class Weight** is assigned, so that the sum of class weights adds up to 100.
- Within each class, a relative **criterion weight** is attached to each individual criterion, again adding up to 100. Thus, each criterion contributes an amount equal to its grade (which should be on a scale of 0-100) multiplied by its relative weight. The sum of the individual amounts is then multiplied by the class weight and added to the corresponding weighted sums of all other classes, resulting in a final 'feasibility grade'.

The above procedure is illustrated below. All weights and grades are arbitrarily assigned, only for the sake of clarifying the example with specific numbers.

Class 1: Functionality feasibility criteria Class weight 30%

	Criterion	Rel. weight (w)	Grade (g)	Product (w) X (g)
1.1	Coverage of needs	25%	100	25
1.2	….	20%	80	16
1.3	….	17%	50	8,5
1.4	….	23%	60	13,8
1.n	Application software maintainability	15%	80	12
	Class grade (Sum of Products)			75,3
	Weighted Class grade (Class weight X Class grade)			**22,6**

Class 2: Technical feasibility criteria Class weight 25%

	Criterion	Rel. weight (w)	Grade (g)	Product (w) X (g)
2.1	Commercial availability of technologies	40%	80	32
2.2	….	10%	80	8
2.3	….	15%	60	9
2.4	….	15%	60	9
2.n	Fitness of infrastructure	20%	90	18
	Class grade (Sum of Products)			76
	Weighted Class grade (Class weight X Class grade)			**19**

Class k: HR feasibility criteria Class weight 28%

	Criterion	Rel. weight (w)	Grade (g)	Product (w) X (g)
k.1	HR requirements	30%	80	24
k.2	HR availability	30%	50	15
k.3	Possibility of Overcoming of Obstacles	40%	40	16
	Class grade (Sum of Products)			55
	Weighted Class grade (Class weight X Class grade)			**15,4**

Total feasibility grade: 22,6 + 19 + ... + 15,4 = 78,5

The same steps are followed for each alternative solution.
If the feasibility grade of the project is higher than or quite close to that of other alternatives, then no further measures need be taken. If, however, it is significantly lower than the alternatives, a project revision should be conducted in order to determine ways to enhance its feasibility. If this fails, more radical measures should be taken, to be determined on a case by case basis.

Guideline 8.2
In spite of the objectivity feeling that all the arithmetic may generate, one must always remember that grading is never free of subjective biases. This subjective dimension can be decreased if a justification is given for each grade assigned, but it can never be totally eliminated. Therefore, the results of this evaluation should always be regarded as indicative and not as some absolute objective truth. Wherever possible, further discussion of issues should be presented, keeping in mind that: ❑ it is best to analyze facts and figures as simply, clearly and concisely as possible and that ❑ opinions should be supported by concrete evidence. A low ranking, especially relative to other solutions, should primarily be used as an opportunity to re-examine assumptions underlying the project and to seek better solutions to specific problems being highlighted.
Using the study results

Guideline 8.2

A feasibility study will probably not provide ‘magic’, clear-cut answers to all vital questions around a project under consideration. So its conclusions must be carefully assessed through rational thinking. Common mistakes to be avoided at this stage are:

- Decisions already taken, totally ignoring the study results
- Tendency to move forward with the project in order to achieve tangible results as quickly as possible, overlooking important aspects and recommendations of the study.
- Excessive caution: If the study results are not fully supportive of the project, more and more information and analysis may be sought, delaying beyond reason whatever decision has to be taken.

9 Appendix A - Documentation

Attach any documentation relative to the study such as: results of a more detailed cost/benefit analysis performed to examine the economic viability of each option, market research documents and statistics, risk assessment reports, detailed feasibility assessment results, etc.

In the following some guidelines on the issues that may be examined within a detailed cost-benefit analysis are offered. Obviously, all these issues must be translated into concrete financial estimates:

Expected Benefits

- Quicker execution of routine tasks (increase of productivity).
  This generates several kinds of financial benefits: If, for example, a task takes 10% less time to complete thanks to the new system, one may consider that the corresponding financial monthly benefit is at least equal to the 10% of the users' salary. If the transaction being accelerated brings revenues to the organisation, these revenues will increase correspondingly due to the increased overall throughput. If the slow execution time until now was the cause of financial claims of the 'customers', these expenses will now be avoided. If increased speed brings new 'customers' to the Organisation, still more revenues may be attributed to it. If, on the other hand, there is no expected increase in the number of transactions, employees' newly freed-up time may be used to perform other tasks, thus reducing the total HR needs of the Organisation or further improving the service level provided etc.

- More clearly defined working environment plus more automatic controls.
  The installation of an ICT system in an Organisation ensures the uniform application of clear rules that can be easily referenced and invoked. Moreover, numerous automatic controls may usually be applied, both at the level of data entry, and at the level of workflow and processing. Thus, the work of employees is facilitated, resulting in additional gains since:
  a. no time is wasted any more just in order to find out what the correct steps are and
  b. fewer mistakes are made, needing less correction time.

- Direct increase of revenues
  An ICT system will help locate and take care of problematic areas of revenue collection.

- Direct decrease or rationalisation of expenses
  Tighter control of expenses, plus the possibility of economies of scale due, for example, to grouping of supplies will usually result in an appreciable decrease of the overall level of expenses.

- Better planning at the strategic and tactical levels
  The availability of reliable, complete, recent data allows the management to trace a better course for the future, both long and short-term. However, although this is a certain source of financial benefits, it is often rather difficult to quantify them.

- Corruption fighting.
  ICT systems discourage corruption on many levels. Not only is it more difficult to treat cases on an ad hoc basis, but also exceptions have to be justified and documented and

their authors may be traced back. This feature is a frequent cause of reticence to the introduction of such systems in Organisations where ‘underground’ mechanisms are operating.

- Services available to other parties and / or public.
  Modern systems are moving towards of rending services to other stakeholders (ministries, institutions and public) within an e-government framework.

- Fulfilment of legislation and / or regulatory measures
  As legislation and / or regulatory framework changes, information systems must be adapted to these changes.

- Fulfilment of international requirements
  A well designed ICT system may help in the production of various statistical or other reports required on a regular basis by international bodies (e.g. epidemiological data required by the World Health Organisation). Failure or delay to provide the requested data harms the image of the Organisation and the country and may result in fines to be paid.

Expected costs

- Cost of system implementation
  This cost may have several components:
  a. Cost of acquisition of equipment and of procurement or development of the applications
  b. Cost of associated services: Installation, Data migration, Training, Project management, Infrastructure preparation (power and communication lines, space accommodation etc).
  c. Hidden cost of personnel involvement: Several people from within the Organisation will have to dedicate appreciable time to the project, providing information, testing the intermediate products, getting the necessary training, verifying the correct contract execution etc. This time would otherwise be used in the normal operation of the Organisation, thus it can be quantified in terms of direct personnel cost plus transactions missed, opportunities lost etc.
- Cost of system operation
  Here again several components enter into play:
  d. Cost of system administration. This may be done through an external contract or by using internal resources (which may e.g. necessitate the setting up of a new or enhanced organisational unit). It can be usually easily estimated.
  e. Cost of system running, in terms of energy consumption, telecommunication lines leasing, supplies etc.
  f. Cost of system maintenance. Maintenance is a very broad term, that may include, apart from the usual corrective and preventive operations on hardware and software, the upgrading of operating environment (procurement and installation of new versions and releases, fine-tuning of applications to the new environment etc), continuous adaptation of applications to the changing operating conditions of the Organisation, addition of functionality to cover needs not initially included in the system design or gradually arising etc.
  g. Cost of system upgrading and/or expanding. The initial design of the system will usually need some modifications after a while. Processing power may need to be increased because more users gradually log on the system, more storage space

required to accommodate archived material, more workstations for the new users, more peripherals, upgraded security equipment etc etc

h. Cost of continuous users training. Trained users will sooner or later leave the Organisation, or move to a different unit, or need to use different applications. New employees will be hired and will need to learn the system. New applications will be added or older ones will be upgraded. All these reasons create a constant need for training which is translated to a usually moderate yearly cost.
i. Cost of organization change. It often happens that the training of the users is not sufficient for the operation of the new systems. Other measures should also be considered, such as public awareness, one stop shops creation etc.

Calculation of present value

Benefits and costs must be estimated on a yearly basis; expected internal or external funding must be accounted for, then, by using appropriate mathematical formulas the present value of the ICT system considered as an investment must be calculated, in order to have a realistic assessment of its financial viability.