Software Application Development
Procedures, Templates and Forms

Completing a Feasibility Study

<table>
<thead>
<tr>
<th>Prepared by:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorised by:</td>
<td>Date:</td>
</tr>
</tbody>
</table>
1. Purpose
The purpose of this document is to provide guidelines in preparing a feasibility study.

2. Scope
This document applies to all feasibility studies for projects prepared within the Department of Land and Water Conservation (DLWC) for development and implementation by Information Management & Technology (IM&T) or an independent third party.

3. References
1. Assessing Project Risk
2. Risk Assessment Checklist
3. Selecting a Project Development Strategy
4. Determining Project Sizing/Estimates

4. Definitions
Feasibility study: This study is an initial assessment, usually costing about 1% to 5% of the entire project budget, with the purpose of making a ‘go or no-go’ decision as to whether to actually commit significant resources and funding to start the project in earnest.

5. Feasibility Review Checklist
The feasibility study is the first line of defence in defect prevention on a systems project. Questions to be considered at this stage are:
1. What is the problem? What would we like to do?
2. Is the problem we are trying to solve clearly understood? Are there any unseen dimensions?
3. Why are we doing this? Who will benefit; how will they benefit and to what extent?
4. Who will be affected by the project?
5. Who will be involved, at all stages and all levels?
6. What are the critical success factors for this project and the delivered project? What constraints are there on the project and product? Can these be reasonably managed?
7. What are the second-order, unintended consequences of the proposed solution? (There are always some!)
8. Are the costs, risks and resource demands clearly understood and justified?
9. Is this the best use of the resource at this time?
10. Is the proposed solution technically feasible?
11. Do the users support this project? Will the proposed solution fit into their existing culture and business operation?
12. What risks are there that the system pay off will not occur as anticipated?
13. Should we be undertaking this project at all or at least as it is currently presented?

Having given consideration to the above questions, compile and present the information using the following template. The size and content of the document will depend upon the complexity of the proposed project.
6. How to write a Feasibility Study

6.1 Responsibilities

1. The Business Analyst/Project Manager is responsible for preparing the feasibility study.
2. The Project Sponsor/Development Manager is responsible for reviewing and signing-off on the feasibility study.

6.2 Elements of a Feasibility Study

6.2.1 Introduction
Include a brief statement describing:
⇒ the purpose of the document
⇒ what the project will do and how it will benefit the organisation
⇒ what is contained in the report eg. a brief summary of the project background, the preliminary findings concerning the project, a recommendation of the next action to take and a plan for carrying out the recommendation.

6.2.2 Project objectives
Describe what the project aims to deliver.

6.2.3 Recommendations
Detail proposed solution and why the solution is the preferred option.

6.2.4 Project scope and constraints
Clearly define the boundaries of the project, detailing what is included and what is excluded.
If the project is proposed to be multi-phased, include details of all phases.

6.2.5 Critical success factors
List all the factors that are required for the project to be successful.

6.2.6 Risk analysis
Refer to Assessing Project risk for guidelines. The complexity and detail of the risk analysis should be in proportion to the size and complexity of the project. Examine the various options and assess the technical and economic feasibility of implementing the options.

6.2.7 Cost benefit analysis
Provide detail of all once-off capital costs and any recurring costs such as system maintenance and data update.

6.2.8 Stakeholders
List all parties, and their respective roles, who have an interest in the successful implementation of the project.

6.2.9 Related projects and services
List all projects which may be impacted by or have an impact on the new project.
6.2.10 High level system analysis and design
Provide a preliminary analysis and design of the proposed solution.

Discuss any other alternatives that were considered and why they were discarded in favour of the preferred option.

6.2.11 Project development strategy
Refer to the procedure, Selecting a Project Development Strategy for guidelines.

6.2.12 Project plan
Complete a project plan and schedule using MS Project.
1. Detail the organisation of the project, both internal and external; the structure and reporting relationships including any third party suppliers.
2. Detail here the deliverables from each major task.
3. Determine project sizing/estimates.
4. Determine resource requirements

6.2.13 Quality plan
1. Describe briefly all objectives that will need to be met to ensure that the delivered application is fit for its intended use eg. consistent with integration requirements, be fully tested and documented in accordance with the IM&T Quality System etc.
2. Describe the control mechanisms that will be in place to ensure delivery of all quality objectives.
3. Describe how issues will be managed and resolved.
4. Describe any procedures that will be used to keep track of project changes.

6.3 The process of completing a feasibility study

<table>
<thead>
<tr>
<th>WHO IS RESPONSIBLE</th>
<th>ACTIONS</th>
</tr>
</thead>
</table>
| The Business Analyst/Project Manager, in conjunction with the Developer, if appropriate, shall: | prepare the feasibility study:  
⇒ addressing the issues raised in 5. Feasibility Review Checklist and  
⇒ using the template FEASIB.DOT.  
Note: Detail shall be appropriate to the size and complexity of the proposed project  
forward the document to the Development Manager |
| The Project Sponsor/Development Manager shall: | review and discuss the feasibility study sign-off on the document. |

7. Documentation

1. Feasibility Study Example.
<table>
<thead>
<tr>
<th><strong>Project Name:</strong></th>
<th>INRMS FLOODS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Document Title:</strong></td>
<td>Feasibility Study</td>
</tr>
<tr>
<td><strong>Prepared by:</strong></td>
<td>Paul Trundley</td>
</tr>
</tbody>
</table>

**COMMENTS:**

<table>
<thead>
<tr>
<th><strong>Approved:</strong></th>
<th>Signed copy on file</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Authorised by:</strong></td>
<td>Neil Benning</td>
</tr>
<tr>
<td><strong>Date:</strong></td>
<td>1/9/98</td>
</tr>
</tbody>
</table>
INRMS Floods Feasibility Study

Acronym: Floods
Full Name: NSW Floodplain Management Database

Project Proposal

Introduction

The project was initiated within INRMS at the beginning of 1997, although it originated even earlier. User group meetings culminated in a preliminary design delivered July 1997. After delays, a prototype was delivered and accepted in July 1998. The prototype substantially scopes the functionality and data requirements. Much of the information that was previously collected and analysed is incorporated into this document.

The project is required to deliver a centralised on-line application and database which supports the State’s Floodplain Management Program. Its data will be available to all parties involved in floodplain management.

Project Objectives

The project aims to deliver an application and database that supports the business needs which are to:

• record floodplain management related data and be able to access it efficiently, consistently and in good quality.
• be a component of the National Flood Database and contribute to its research and policy development.
• conform to the (late) Australian Water Reform Resources Council recommendations.

Recommendations

We should proceed with the project but on the basis of ‘keep it simple’. There are no risks beyond the limited funding. Given this limitation we must restrict the application to what is essential, retaining further functionality for a possible version 2.

Scope

The essential business scope of Floods is described by the prototype developed as a separate project prior to commencing this project. Any divergence from the content of the prototype must be in accordance with change control procedures.

The application will run on a DLWC LAN accessing a central database.

The application will be designed with the objectives of clarity, simplicity, speed and minimising the hardware requirements.

The application will construct metadata tables as part of its database, defined to the standards supplied by the Metadata project and incorporate their metadata maintenance modules. (The metadata details are not available at the time of writing. If they are not available to be included in the requirements definition they will not be part of the project.

Security is limited to individual users having read only or read/write access. A log will be maintained of all logins.

Training material and user documentation will be developed from the same specifications as the application code and have separate INRMS funding.

Critical success factors
It is essential to this project that there:
• are suitable personnel available to provide details of the business activity.
• is a project manager available to co-ordinate access to users and to assist the technical development personnel in business matters.

Risk assessment
This is a small application with a limited cost. The risk analysis on a similar scale.

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Risk</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Identified in Project Proposal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insufficient funding</td>
<td>Medium</td>
<td>Only 21 days for feasibility, requirements spec, func spec and design; 36 days for programming and database build, BUT, 15-20 man days allowed for testing tho mainly a user activity. MUST ‘keep it simple’.</td>
</tr>
<tr>
<td>Funding being withdrawn</td>
<td>Low</td>
<td>This is not normal practice.</td>
</tr>
<tr>
<td>Project Manager or the BA may be moved before end of the project</td>
<td>Medium</td>
<td>Involvement of other personnel and good doco reduces the impact.</td>
</tr>
<tr>
<td>There is an A/P available when required</td>
<td>Low</td>
<td>Could delay the application but not stop it.</td>
</tr>
<tr>
<td>May have to modify if National Floods Database later sets different standards</td>
<td>Low</td>
<td>Does not affect this application but may increase upgrade costs. More likely they will follow us. Not a risk.</td>
</tr>
<tr>
<td><strong>Considered in this study</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business environment and impact on business</td>
<td>Low</td>
<td>Commitment is good, needs are reasonably clear and not overly complex, the only business change needed is this automation.</td>
</tr>
<tr>
<td>Technical environment: general</td>
<td>Low</td>
<td>Standard DLWC MS/ICON environment, similar style to previous applications.</td>
</tr>
<tr>
<td>Development methodology</td>
<td>Low/medium</td>
<td>Standard lifecycle, some fast-track. Some extra complexity from need to comply with integration - manageable</td>
</tr>
<tr>
<td>Size, timescale, costs</td>
<td>Low/medium</td>
<td>Generally a discrete area; short time, funding &amp; time low; return should be high.</td>
</tr>
</tbody>
</table>
Cost benefit analysis

The costs of development from this time are estimated as follows:

Capital cost:
- IM&T development costs: $50k
- IM&T documentation costs: $20k
- ‘Floods’ personnel: $40k opportunity cost
- Data input of historical data: $ Indeterminate, depends on how much is entered

Recurring costs:
- System maintenance and training: $25k pa
- Annual data update: $10k pa

The budgeted benefits of the system were estimated at delivering productivity gains of $250k pa.
Improved flood mitigation is the business deliverable.
The expected benefit to the community is millions of dollars.
DLWC will also be in a better position to participate in research, be more involved in the national water industry and policy, and be able to maintain its leadership in floodplain management.

Stakeholders

The following have an interest in the successful implementation of the Floods application.

<table>
<thead>
<tr>
<th>Role</th>
<th>Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Director, Land &amp; Catchment Management</td>
<td>Mike Geary</td>
</tr>
<tr>
<td>Project Director</td>
<td>Neil Benning</td>
</tr>
<tr>
<td>Range of DLWC sections (eg CNR)</td>
<td></td>
</tr>
<tr>
<td>Regional Directors</td>
<td>8 directors</td>
</tr>
<tr>
<td>Manager, Floods Unit</td>
<td>Jim Bodicott</td>
</tr>
<tr>
<td>Floods Project Manager</td>
<td>Safar Sarmed</td>
</tr>
<tr>
<td>INRMS Project Director</td>
<td>Neil Bennett</td>
</tr>
<tr>
<td>Range of Federal, State and Local Agencies</td>
<td></td>
</tr>
<tr>
<td>Applications Development Manger</td>
<td>Tony Shields</td>
</tr>
</tbody>
</table>

Related projects and services

This project must comply with the INRMS integration objectives. So it is likely to affect or be affected by the requirements of all INRMS applications. One design option is to use the ‘All Sites’ shared table. It achieves part of the integration sought by the Integration project.

No data is transferred automatically to or from any other application.

The Icon LAN upgrade is currently underway. We estimate that the necessary environment will be available from February 1999.
High Level System Analysis and Design

The preliminary design dated July 97 and the prototype accepted by the Project Director August 98 are included as the high level system analysis and design. (Attached as appendices).

Design Alternatives

The two clear options are to build the database and presentation layer:
• along INRMS integration lines, or
• based purely on the needs of the application.

As an INRMS funded project the application must adhere to integration requirements unless we discover in the more detailed design that this presents undue difficulty.

Project Development Strategy

The Project Manager will be responsible for obtaining business or user input from appropriate personnel, though he may organise meetings between users and developers if required. This project will deliver functionality that meets the essential requirements only (and seek further funding for an enhanced version).

Outsourcing the coding of the application will be evaluated.

Test plans will be developed as soon as the design is approved.
Project Plan

Tasks and Deliverables

The tasks are listed in the high level project schedule (in MS Project©). The deliverables from each major task are:

- Feasibility study
- Requirements specification
- Functional specification
- Detailed design
- Program specifications
- Final project plan
- Training plan
- Program code
- Test plan
- Tested program code
- Implementation
- Training

Not all of the tasks will be completed by the core team.
Some tasks are separately funded.

Project Sizing and Cost Estimates

The project has a maximum size set by the prototype which was developed prior to this study. The project is also limited to the allocated funding of $50,000. The project schedule and resource usage has been calculated from these. In order to deliver within budget and on time the scope of the project must be restricted to the essential functionality.

Resource Requirements

The personnel requirements are summarised:

<table>
<thead>
<tr>
<th>Resource</th>
<th>Number</th>
<th>Work Days</th>
<th>Funding Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Manager</td>
<td>1</td>
<td>52</td>
<td>Business area</td>
</tr>
<tr>
<td>Business Analyst</td>
<td>1</td>
<td>40</td>
<td>Project budget</td>
</tr>
<tr>
<td>Analyst Programmer</td>
<td>1</td>
<td>55</td>
<td>Project budget</td>
</tr>
<tr>
<td>Testers</td>
<td>3</td>
<td>9 each</td>
<td>Business area</td>
</tr>
<tr>
<td>User Doco Writer</td>
<td>1</td>
<td>18</td>
<td>Tech writing budget</td>
</tr>
<tr>
<td>Training Doco Writer</td>
<td>1</td>
<td>17</td>
<td>Tech writing budget</td>
</tr>
<tr>
<td>Training (PM and User1)</td>
<td>2</td>
<td>5 each</td>
<td>Business area</td>
</tr>
</tbody>
</table>

The high level schedule (in MS Project©) shows a breakdown of resources required for the major tasks. The Project Manager (PM) is required throughout the project. Once the specifications and design are completed, the PM can take over the residual duties of the BA.
Schedule of Work

A project schedule has been developed in MS Project© which provides an outline schedule of the high level tasks to be undertaken.

In summary:

<table>
<thead>
<tr>
<th>Task</th>
<th>Start</th>
<th>Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasibility Study</td>
<td>10 Aug 98</td>
<td>14 Aug 98</td>
</tr>
<tr>
<td>Requirements</td>
<td>17 Aug 98</td>
<td>04 Sep 98</td>
</tr>
<tr>
<td>Specification</td>
<td>07 Sep 98</td>
<td>22 Oct 98</td>
</tr>
<tr>
<td>Design Details</td>
<td>12 Oct 98</td>
<td>22 Dec 98</td>
</tr>
<tr>
<td>Implementation</td>
<td>01 Feb 99</td>
<td>10 Feb 99</td>
</tr>
</tbody>
</table>

The one month between completion of the build and the implementation allows for an expected non availability of the new LAN environment. As well as being a useful buffer it will also provide an opportunity for users to load data into the database in a limited environment.

Project Organisation

IM&T Application Development provides the technical resources to the project which is owned by Sustainable Land and Coastal Management. Funding is from INRMS whose steering committee is responsible for overseeing that the project meets objectives and is within budget.

Quality Plan

A fast track feature is included. The Project Director has agreed to review work as we progress. Project tasks do not need to wait for a review to complete.
The Quality Objectives

The delivered application will:
- accept only data which conforms to the agreed specification for that data
- have no loss of meaning of data between storage and retrieval of that data
- provide the functionality which is specified in the final design
- allow access to authorised users on a read only or read/write basis
- be consistent with integration requirements
- be fully documented in accordance with the IM&T quality system
- be fully tested when delivered to the Project Director
- have a documented procedure for users to notify IM&T of any problems that arise.

This table describes how the quality objectives will be achieved.

<table>
<thead>
<tr>
<th>Quality Objectives</th>
<th>Control Mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accept only data which conforms to the agreed specification for that data</td>
<td>• define precisely</td>
</tr>
<tr>
<td></td>
<td>• test the business rules have been applied</td>
</tr>
<tr>
<td>Have no loss of meaning of data between storage and retrieval of that data</td>
<td>• build database tables that embody the data structures defined in data analysis</td>
</tr>
<tr>
<td></td>
<td>• test the business rules have been applied</td>
</tr>
<tr>
<td>Provide the functionality which is specified in the final design</td>
<td>• define the functionality and business rules precisely</td>
</tr>
<tr>
<td></td>
<td>• have users confirm the functional requirements</td>
</tr>
<tr>
<td></td>
<td>• test the business rules have been applied</td>
</tr>
<tr>
<td>Allow authorised access only</td>
<td>• define authorisation precisely</td>
</tr>
<tr>
<td></td>
<td>• test the business rules have been applied</td>
</tr>
<tr>
<td>Be consistent with integration requirements</td>
<td>• review design with peers and INRMS steering committee</td>
</tr>
<tr>
<td>Be fully documented in accordance with the IM&amp;T quality system</td>
<td>• involve the tech writer early</td>
</tr>
<tr>
<td></td>
<td>• review tech writer’s output as developed</td>
</tr>
<tr>
<td>Be fully tested when delivered to the Project Director</td>
<td>• follow quality system guidelines</td>
</tr>
<tr>
<td></td>
<td>• train users in testing</td>
</tr>
<tr>
<td>Have a documented procedure for users to notify IM&amp;T of any problems that arise.</td>
<td>• modify standard notification document</td>
</tr>
</tbody>
</table>

Review and Audit Schedule

This is included in the MS Project© project schedule, included as an appendix. There are reviews of all plans and specifications immediately after each is completed. The Project Director and the Applications Development Manager will be involved in a continuous work review.

Defect Prevention and Assessment of Work
The Project Manager will review all work while it is being undertaken. At all times he will ensure that it:
• complies with the requirements
• is accurate insofar as it is possible to assess.

To achieve this the Project Manager will conduct a review session with each developer (including the BA) twice a week. The PM will maintain a log of the reviews.

**Issues Management**

An issue exists when a matter cannot be resolved immediately. The Project Manager will keep a log of all issues which are raised.

As the Project Director is keenly involved in this development, issues will be referred to him for his views and possible determination, whenever possible.

**Project Change Control**

The Requirements Specification and the Functional Specifications cannot be delayed beyond the times allocated. During the definition of business and functional specifications the detail will be documented for approval by the Project Director.

Any changes which are outside the agreed scope or which would cause the project to be behind schedule will be subject to formal change control. The Quality System guidelines will apply. Changes will only be permitted if there is funding for the extra resources needed. In all cases both the Project Director and the Applications Development Manager must agree to the changes being accepted into the project.

The Pre-production System Change Request procedures will be followed in all cases where there is a request to make changes to a signed-off requirement. The Project Director’s approval will be mandatory for all but small changes of detail.

**Appendices**

1. Schedule (Gantt chart), PERT chart, Resource Usage table
3. Preliminary Design NSW Flood Database July 1997