**SERIS**

Solar Energy Research Institute Singapore



Cloud Based Real-time Analytical Monitoring of Photovoltaic Systems and Weather Parameters Project

Risk Management Plan

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# Introduction

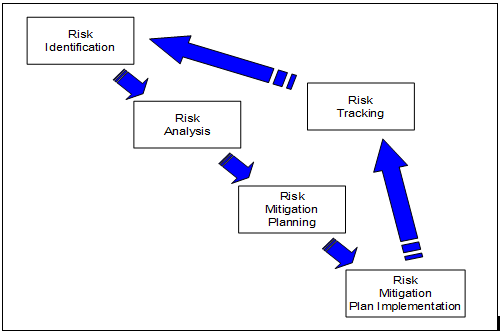
Risk can be associated with all aspects of a software development project (e.g., threat, technology maturity, product capability, design maturation, performance against plan) as these aspects relate across the Work Breakdown Structure (WBS) and Project Plan. Risk addresses the potential variation in the planned approach and its expected outcome.

Risk management is a continuous process that is accomplished throughout the life cycle of software development. It is an organized methodology for continuously identifying and measuring the unknowns; developing mitigation options; selecting, planning, and implementing appropriate risk mitigations; and tracking the implementation to ensure successful risk reduction

## Overview

We are adapting to the following ‘Risk Management Model’ for this project. The risk management process model (see figure) includes the following key activities, performed on a continuous basis:

* Risk Assessment
  + Risk Identification 🡺 Risk Analysis 🡺 Risk Prioritization
* Risk Control / Mitigation
  + Risk Planning 🡺 Risk Resolution 🡺 Risk Monitoring

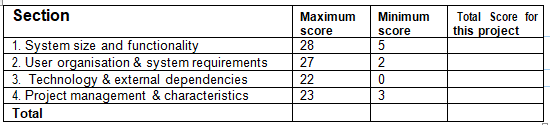


# Risk Assessment

The primary objective of performing risk assessment is to identify and analyse the risks. We are using the attached ‘Risk Assessment Questionnaire’ for an initial assessment of the risks associated with the project. The Questionnaire is organized in to four sections

1. System Size & Functionality
2. User organization and Systems requirements
3. Technology & external dependencies
4. Project management & Characteristics

After carrying out the risk assessment we are able have quantitate assessment on the risks associated with each section and a summary score for the project itself.

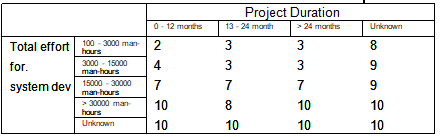


## Risk Assessment Questionnaire

The detailed risk assessment questionnaire filled-in with relevant scores for the project

#### System Size & Functionality

1. Total effort and duration for systems development  **2 .**



1. Number of sub-projects within the project  **1 .**

* None or one 1
* Two 2
* > Two 3

1. Number of user departments involved with the project  **1 .**

* None or one 1
* Two 2
* > Two 3

1. Number of user personnel (both end-users, and user IT staff) required to operate system after installation  **1** .

* < 20 1
* 20 - 50 2
* > 50 3
* Unknown 2

1. Number of different geographical locations that will be encompassed by the system  **0** .

* One 0
* Two - three 1
* > Three 2
* Unknown 2

1. Number of existing systems that the new system must interface with  **2** .

* None 0
* One 1
* Two 2
* > Two 3
* Unknown 2

1. Technical complexity of system  **2** .

* Straightforward 0
* Average 1
* Complex 2
* Very complex 4
* Unknown 3

#### User organisation and Systems requirements

1. The system may be best described as:  **2** .

* Totally new system 2
* Replacement of an existing computerised system 1
* Enhancement of an existing computerised system 0

1. How well understood are the User requirements by  **2** .

* the development team 0
* Well understood, only minor uncertainties 1
* Mostly understood, but one or two uncertainties 2
* Major areas of uncertainty 4

1. Real-time performance of the system is  **3** .

* Not critical 0
* Critical due to throughput 1
* Critical due to response time 3
* Critical due to availability 3
* Unknown 2

1. Does the User organization and/or procedures have to change to meet the requirements of the new system?  **1 .**

* No 0
* Minimal changes 1
* Major changes 2
* Unknown 1

1. What degree of flexibility and judgment can be exercised by the Development team in modifying the user requirements  **1** .

* Can negotiate changes of >10% of the requirements 0
* Can negotiate changes of 0 - 10% of the requirements 1
* User requirements cannot be changed by the network integrator 3
* Unknown, degree of flexibility not yet determined 2

1. What degree of flexibility and judgment can be exercised by the User in modifying the user requirements  **2** .

* User has considerable flexibility in modifying requirements 4
* User has flexibility in modifying requirements, but will use formal change control 3
* procedures and/or will accept incremental enhancement of system functionality 2
* User requirements cannot be changed by the User after initial agreement in req. analysis 1
* Unknown, degree of flexibility not yet determined 2

1. Is this project dependent upon the output or products of another project?  **0** .

* No 0
* Yes, but the project which this project is dependent on is of low or normal risk 1
* Yes, and the project which this project is 3
* dependent on is high risk Yes, and the project which this project is 3
* dependent on is of unknown risk 2

1. What is the general attitude of the user?  **0** .

* Poor, anti-IT solution 2
* Fair, some reluctance to use IT solution 1
* Good, is eager to adopt & use system 0
* Unknown 1

1. How committed is the user executive management to the project?  **0** .

* Reluctant to commit 2
* Restrained level of commitment 1
* Extremely enthusiastic 0
* Unknown 1

1. How great is the user involvement in the project  **1** .

* No involvement other than formal project/contract management 2
* Part-time user representatives involved in project design reviews, etc 1
* Full-time user representative involved in requirements specification, design team.... 0
* Unknown, commitment not yet made 2

#### Technology & external dependencies

1. Is Hardware required that is new to the developer?  **2** .

* None 0
* Processor 1
* Terminals/PC's 2
* Networking Hardware 3
* Hardware not yet identified 2

1. Is special non-standard hardware required  **0** .

* None 0
* Processor 1
* Terminals/PC's 2
* Networking Hardware 2
* Hardware not yet identified 1

1. What portion of the Software component to be used in the system is to be developed as new  **2** .

* No new software to be developed 0
* 0-25% of the software to be developed as new 1
* 25-50% of the software to be developed as new 2
* 50-75% of the software to be developed as new 3
* >75% of the software to be developed as new 4
* Unknown 4

1. If a significant portion of the Software component to be used in the system consists of existing software products, what familiarity does the developer have with the products?  **3** .

* Developer has no experience of these products 3
* Developer has some experience, or has used similar products 1
* Developer has thorough experience with product 0
* Unknown, not yet identified 2

1. Novelty of proposed development methods & system  **0** .

* First time the proposed development methods have been used by development team 4
* First time the development methods have been used by 50% of the development team 2
* None of the above 0

1. How good is the Hardware vendor/methodology vendor/tools vendor support?  **0** .

* Unknown/Poor 3
* Adequate 1
* Good 0

1. How knowledgeable is the development team in the similar application domains  **1** .

* Limited 3
* Understands concepts, but no experience 1
* Have been involved in similar previous projects 0

#### Project management & Characteristics

1. Project schedule, Major milestones and operational dates are  **2** .

* Flexible ; may be established and adjusted by the project team 1
* Firm; established internally, but thereafter are considered "fixed" by the client 2
* Fixed; established by the client and not easily negotiable 4
* Unknown, not yet discussed or agreed 4

1. Project manager availability, experience & training  **4** .

* Project manager not yet identified 5
* Project manager identified and his experience level can be best described as:
  + Successful recent experience in managing a project similar in size or application, 1
  + Successful recent experience in managing part of a project similar in size or application, or a dissimilar project, 2
  + No recent experience, but has had formal training, 4
  + No recent experience or training 7

1. Approved project planning, tracking and reporting techniques are documented and committed to this project  **4** .

* Yes 0
* No 4

1. Key project skill and manning-level requirements can be met by:  **1** .

* Team members within the developers organisation
  + who will be working full-time on the project 1
* Team members within the developers organisation
  + who will be working part-time on the project 3
  + No team members have been formally identified 5

1. A plan for chief architect or centralised technical control is documented and committed for this project  **3** .

* Yes 0
* No 3

### Quantitative Risk Assessment

The quantitative summary for the project is tabled below, which derived from the section scores above. The total risk score for the project is **43** on a scale 10 to 100

|  |  |  |  |
| --- | --- | --- | --- |
| **Section** | **Max. Score** | **Min. Score** | **Total Score for this Project** |
| A. System size and functionality | 28 | 5 | 9 |
| B. User Organization & system requirements | 27 | 2 | 12 |
| C. Technology & external dependencies | 22 | 0 | 8 |
| D. Project management & characteristics | 23 | 3 | 14 |
| **Total** | 100 | 10 | **43** |

### Qualitative Risk Assessment

To arrive at a qualitative risk classification of the project, we have used the following guidelines based on the quantitative score derived for the project, i.e. 43 on a scale of 0 to 10…100

* If score of project is < 30 then project is of **low risk**
* If score of project is > 30 & <50 then project is of **medium risk**
* If score of project is >50 then project is of **high risk**

Since our score for this project is 43, the project can be classified as ‘**Medium Risk** project’ based on the above guide lines.

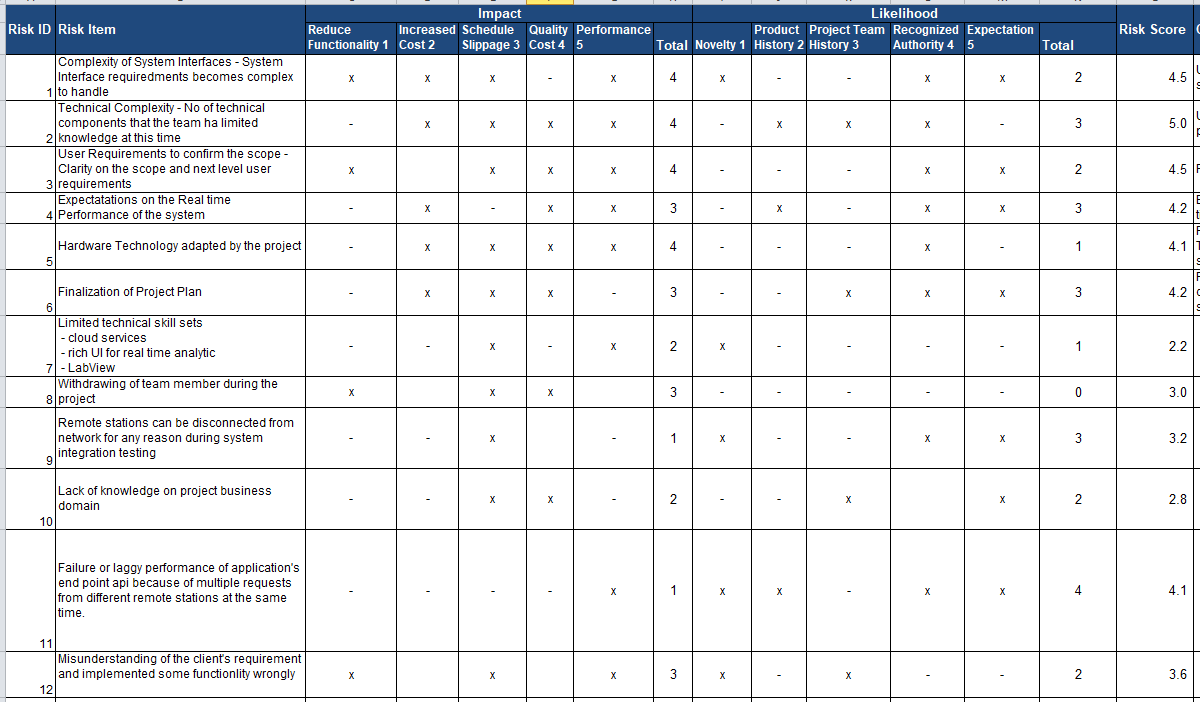
### Identification and Classification of the Risk Items

From the questionnaire the following risk items have been identified and classified as having relatively larger impact on the project

* Understanding the no of interfaces and the requirements for each of those interface
* Understanding the technical complexity of the project and being able to deliver the project
* Finalization of User requirements
* Expectations on systems performance(Real time)
* Familiarity of the Hardware Technology to be adapted by the proposed system
* Agreed Project Plan with Mile stones and expected deliverables

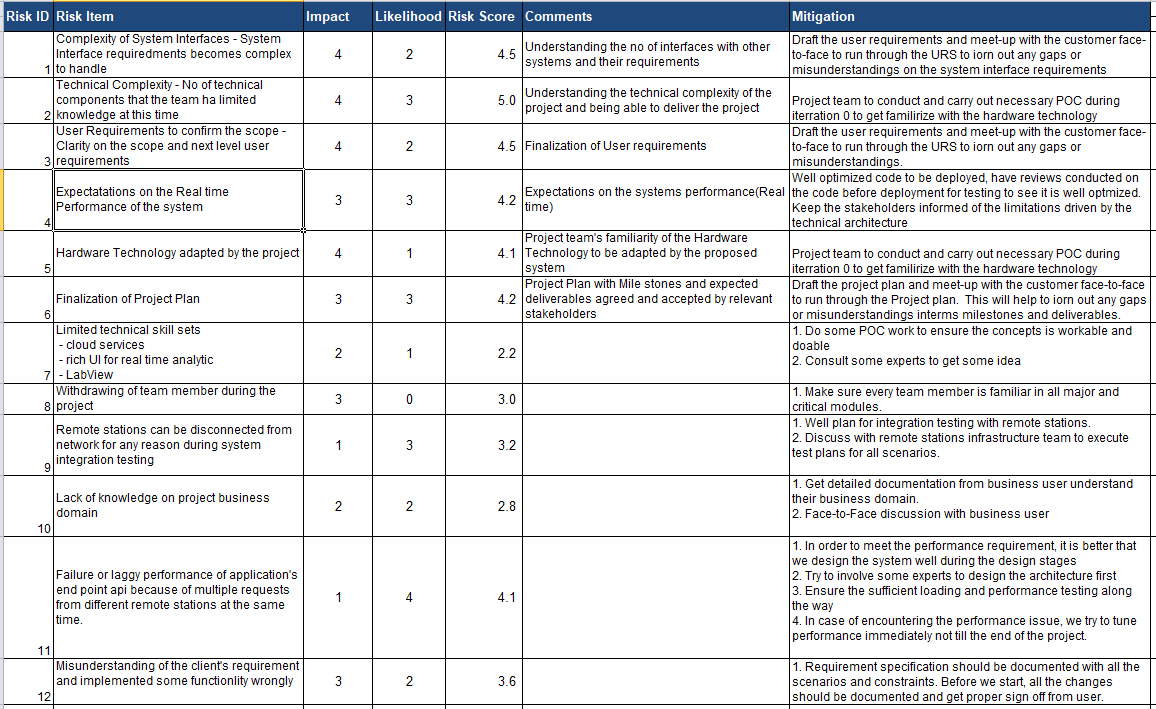
## Risk Check-Box List

The risk ‘check-box’ list with details of impact, likelihood and their calculated Risk Score.



# Risk Register

Based on the outcome of the risk assessment the identified risk are transferred to the risk register for further analysis, tracking and control



# Risk Control and Monitoring

The team has agreed to periodically review the risk register and update it. Similarly the team members are informed to notify the project team in case of new risks arising from their assigned work areas & tasks.

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