

Team 16

NGO Information Management Suite 1.0

Risk Monitoring, Mitigation and Management Plan

**Overview:**

Risk Monitoring, Mitigation and Management Plan for NGO Information Management Suite.

**Intended Audience:**

NIMS Stakeholders (NGO actors):

- Employees who work for the NGO i.e.; the coordinators collecting data for the NGO from villages and communities.
- Administrator staff that accesses and analysis the database and all the information maintained on server-side.
- Donors who are directly or indirectly related to the working of the NGO.
- This also includes the investors if any for the project.

NIMS development staff:

- This includes the whole TEAM-16 of batch 2009 of DA-IICT institute working on the project and responsible for the maintenance of the project product: the software platform.

**Revision History:**

Version	Primary Author(s)	Reviewed By	Date Completed
2.0	Surbhi Jatan Jesal	Parth, Aakash	7 <sup>th</sup> April 2012
1.0	Surbhi Jatan Jesal	Parth	2 <sup>nd</sup> April 2012

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# **1. Introduction:**

## **1.1. PURPOSE:**

As organizations begin new projects they begin operating in an area of uncertainty that comes along with developing new and unique products or services. By doing so, these organizations take chances which results in risk playing a significant part in any project. The purpose of risk management is to identify potential problems before they occur so that risk-handling activities may be planned and invoked as needed across the life of the product or project to mitigate adverse impacts on achieving objectives.

The purpose of this plan is to determine risk sources and categories, analyze and categorize risks and to strategize our risk management of our project. The risk management plan is to establish the framework in which the project team will identify risks and develop strategies to mitigate or avoid those risks. However, before risks can be identified and managed, there are preliminary project elements which must be completed. These elements are outlined in the risk management approach.

However the primary purposes of this document are:

1. Risk Identification
2. Risk Analysis
3. Risk Management and Mitigation
4. Risk Review and Monitoring

## **1.2. INTENDED AUDIENCE:**

Generally, the Risk Management Plan applies to everyone on the project, including the users and stakeholders.

NIMS Stakeholders (NGO actors):

- Employees who work for the NGO i.e.; the coordinators collecting data for the NGO from villages and communities.
- Administrator staff that accesses and analysis the database and all the information maintained on server-side.
- Donors who are directly or indirectly related to the working of the NGO.
- This also includes the investors if any for the project.

NIMS development staff:

- This includes the whole TEAM-16 of batch 2009 of DA-IICT institute working on the project and responsible for the maintenance of the project product: the software.

## 1.3 Risk Management Approach:

### 1.3.1 Risk identification:

Risks are about events that, when triggered, cause problems. Hence, risk identification can start with the source of problems, or with the problem itself.

- **Source analysis:** Risk sources may be internal or external to the system that is the target of risk management.
- **Problem analysis:** Risks are related to the identified threats.

### 1.3.2 Risk Analysis:

Risk analysis is highly essential in software development projects. No software development life cycle is said to be complete unless it has passed through rigorous and active consideration of the several types of risk associated with the development of the software. During risk analysis, the **value of opportunities to pursue** vs. **threats to avoid** and the **opportunities to ignore** vs. **threats to accept** are assessed. Risk analysis involves:

- assigning each risk with its probability of occurrence
- estimating the impact of each risk

Risk analysis helps in preparing a contingency plan to contain the risk effects.

### 1.3.3 Response Planning:

Response planning is aimed at determining options and actions to reduce the likelihood or consequences of risk impact on the project's objectives or progress. During response planning, risk management and contingency plans are developed that describe the action to be taken to mitigate each risk and the action to be taken when this risk event occurs. Response planning also involves assigning responsibilities for each agreed response. Response tracking is maintaining required documents that state necessary conclusions throughout the software development life cycle.

### 1.3.4 Risk Monitoring and Control:

Risk monitoring and control is highly important for avoiding the occurrence of a risk event. It involves the development, implementation and monitoring of corrective action plans that help in avoiding risk.

## 2. ROLES AND RESPONSIBILITIES:

In our project there are different roles assigned and undertaken by different group members and sub-groups related to the risk management and mitigation for the project.

These are as follows:

<b>Roles</b>	<b>Responsibilities</b>	<b>Member or group associated</b>
<b>Project manager</b>	The project manager is responsible for approval of the risk management plan (this document), leads and participates in the risk management process, and takes ownership of risk mitigation/contingency planning and execution and regular reporting of the risks to the Steering Committee.	Aakash Solanki
<b>Risk manager</b>	Facilitates the identification, recording, and monitoring of risks and issues in liaison with project personnel, SMEs, and stakeholders, identifies and records new risks and issues from own assessment of project activities, reviews on a regular basis all risks and issues across all work streams with an emphasis on high-risk items, works with risk owners and SMEs on developing risk mitigation strategies and risk treatment plans.	Parth Manvar (Server side) Anshul Agarwal (Client side)
<b>Project team</b>	Project team members (analysts/product managers, developers, testers, and deployment team members) participate in the risk identification process and discuss risk monitoring and mitigation activities at team meetings.	Team 16, Btech 2009
<b>Steering committee</b>	Provide direction on risks and issues that cannot be resolved between the Risk Manager, Project Manager, risk owners, and stakeholders.	Team 16, Btech 2009
<b>Stakeholders</b>	Stakeholders assist in monitoring risk action effectiveness and participate in risk escalation, as necessary.	Investors

<b>Project sponsors</b>	Project sponsors participate in risk identification and risk activities, as necessary. Project sponsors also receive escalated risks and assist with mitigation and contingency actions for escalated risks and cultivate a culture that rewards early identification and treatment of risks and issues.	NGO head
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### 3. RISK IDENTIFICATION

During risk identification potential sources of risk and potential risk events are developed.

<b>RISK AREAS</b>	<b>RISKS IDENTIFIED</b>
Product Size	Indetermination of problem size
Customer Characteristics	Not understanding the exact requirements of the NGO
Process Definition followed	Difficulty in meeting the deadlines
Process Definition followed	Unrealistic deadlines for deliverables
Process Definition followed	Not following the process defined for development
Process Definition followed	Wrong selection of the Software Development Life Cycle to complete the project in the given time and with the given team members
Technology to be built	Lack of experience/training in using software tools and technologies
Business Risk	Timely availability of low cost Android tablet
Technology to be built	Complexity and newness in android application development, social mapping and client-server interface

Staff and Experience	Unavailability of team members
Staff and Experience	Conflict among team members
Staff and Experience	Inconsistent documents and reviews
Staff and Experience	Distribution of work not done according to the skill sets of the team members
Staff and Experience	Inexperience in first hand planning for big software development projects
Development Environment	Incompatibility errors on integration of two different development environments
Performance Risk	Android application crash
Performance Risk	Unavailability of GPS in Android tablet device
Performance Risk	Coordinator not adjustable with the android application and device
Performance Risk	Battery of Android device getting drained quickly

#### 4. RISK ANALYSIS:

After risks are identified and documented, risk analysis is performed to analyze each potential risk event for:

- Probability of Occurrence
- Impact of the risk event if it occurs

The potential likelihood that a given risk will occur is assessed and an appropriate probability of occurrence is selected from the table in tables section.

The potential impact of each risk is analyzed and an appropriate impact level is selected from the **table 1 in the appendix**, the risk probability table.



The risk analysis for our project NIMS suite is as follows:

<b>RISK</b>	<b>PROBABILITY OF OCCURRENCE</b>	<b>IMPACT LEVEL VALUE</b>	<b>TOTAL RISK SCORE</b>	<b>RISK RANK</b>
Indetermination of problem size	Probable – 0.50	High – 0.40	0.200	9
Not understanding the exact requirements of the NGO	Probable – 0.50	Very High – 0.80	0.400	2
Difficulty in meeting the deadlines	High – 0.70	Moderate – 0.20	0.140	14
Unrealistic deadlines for deliverables	Probable – 0.50	High – 0.40	0.200	11
Not following the process defined for development	Low – 0.30	Moderate – 0.20	0.060	16
Wrong selection of the Software Development Life Cycle to complete the project in the given time and with the given team members	Probable – 0.50	Very High – 0.80	0.400	3
Lack of experience/training in using software tools and technologies	Probable – 0.50	High – 0.40	0.200	10
Timely availability of low cost Android device for testing	Probable – 0.50	High – 0.40	0.200	12

Complexity and newness in Android application development, social mapping and client-server interface	Very High – 0.90	Moderate – 0.20	0.180	13
Unavailability of team members	Probable – 0.50	Very Low – 0.05	0.025	20
Conflict among team members	Low – 0.30	Moderate – 0.20	0.060	17
Inconsistent documents and reviews	Very Low – 0.10	High – 0.40	0.040	19
Distribution of work not done according to the skill sets of the team members	Probable – 0.50	High – 0.40	0.200	8
Inexperience in first hand planning for big software development projects	Very High – 0.90	High – 0.40	0.360	4
Incompatibility errors on integration of two different development environments	Probable – 0.50	High – 0.40	0.200	6
Android application crash	Very Low – 0.10	Moderate – 0.20	0.200	7
Unavailability of GPS and GPRS	Probable – 0.50	High – 0.40	0.200	5
Coordinator not adjustable with android application	High – 0.70	Very high – 0.80	0.560	1

and device				
Battery of Android device getting drained quickly	Low – 0.30	Moderate – 0.20	0.060	15

After the risks are prioritized according to their scores, a risk probability and impact matrix is generated which helps in deciding the relative priority of risks. Risks that fall into red-shaded cells of the matrix shown below are of the highest priority and should receive a majority of the risk management resources during response planning and risk monitoring and control. Risks that fall into the yellow-shaded cells of the matrix are of the next highest priority, followed by the risks that fall into the green-shaded cells. The risk probability and impact matrix for NIMS is as shown below:

Probability of Occurrence	0.05	0.10	0.20	0.40	0.80
0.90			13	4	
0.70			14		1
0.50	19			5, 6, 7, 8, 9, 10, 11, 12	2, 3
0.30			15, 16, 17		
0.10				18	

This table is prepared from the data analyzed in the **table-2 in appendix**, Risk Probability and Impact matrix.

## 5. RESPONSE PLANNING

### 5.1. BACKGROUND

During response planning, strategies and plans of actions are developed to minimize the impacts of risk to a point where the risk can be controlled and managed. Higher priority risks receive more attention than the lower priority risks.

## 5.2. RISK STRATEGIES

The risk strategy employed is Avoidance, Mitigation and Contingency.

- Avoidance:  
Risk avoidance involves changing the overall project management plan to avoid the threat. Risks are identified early in the project can be avoided by clarifying requirements, obtaining more detailed information, improving communications or obtaining expertise.
- Mitigation:  
Risk mitigation involves reducing the probability and/or impact of the risk threat to an acceptable level. Taking early and pro-active action against a risk is often more effective than attempting to repair the damage that a realized risk event has caused.
- Contingency:  
Developing contingency plans helps define the plan of action and strategy to adopt if and when a risk event does occur. It helps in swift and efficient allocation of risk management resources if a risk event occurs.

The risk strategies for our NIMS suite are as shown below:

Risk	Avoidance	Mitigation	Contingency
Indetermination of problem size	Determine the range of the problem size and decide on a realistic scope of project to be implemented	Have well defined and documented scope of the project to be implemented	Review and decide on the problem size that is realistic.
Not understanding the exact requirements of the NGO	Discussion with the NGO about its requirements	Proper documentation of the NGO's requirements	Contacting the NGO for a better understanding of its requirements
Difficulty in meeting the deadlines	Systematic management and distribution of time and resources	Proper planning of the project and appropriate allocation of time and resources for each activity	Review of the deadlines and working efficiently to meet the deadlines

Unrealistic deadlines for deliverables	Setting deadlines realistically keeping in mind the tasks at hand and constraints of time and resources	Review of the deadlines set and distributing the tasks effectively for timely completion	Review of the deadlines and set new deadlines that are realistic keeping in mind all the constraints
Not following the process defined for development	Have a well defined process for development	Keeping track of the project's progress and review of the work completed	Reorganizing to bring the project's development process back on track
Wrong selection of the Software Development Life Cycle to complete the project in the given time and with the given team members	Proper review and understanding of the pros and cons of each software development life cycle and assessment of the project for the most suitable model when selecting it.	Modification of the software development life cycle model selected to better adopt it for the project's efficient and timely completion	Management and review of the work already completed and determining the course of action for the remaining work to be completed successfully
Lack of experience/training in using software tools and technologies	Getting familiar with using the software tools and technologies	Working on a task in groups which have people with experience in using the software tools and technologies	Redistribution of tasks to people with better knowledge and experience of using the software tools and technologies
Timely availability of low cost android device for testing	Analyzing and arranging for the technical resources required before commencing	Finding alternative sources or ideas to overcome the unavailability of android device.	Development and implementation of alternative means to overcome the unavailability of android device.
Complexity and newness in android application development, social mapping and client-server interface	Detailed documentation and planning of each and every language and libraries etc. to be used in our project	Keeping track of the project's progress and getting familiar with the android application and server side user interface	Find external help from people more familiar with the new languages and technologies and form texts and websites and

		development technologies	articles.
Unavailability of team members	Proper planning and communication with the team members	Team members inform the team of their unavailability so that appropriate planning can be done in advance	Reallocation of the urgent and important tasks among the available team members
Conflict among team members	Having healthy debates and discussions and following a defined process for coming to conclusions on the issues at hand	Better communication and discussion among the team members about their thoughts and ideas regarding the task at hand	Resolving the conflict amicably to reach a conclusion with no grudges among the team members
Inconsistent documents and reviews	Having a well defined version control and concurrent control system	Detailed and multiple reviews of the documents	Reassigning the review and modification of the inconsistent documents along with additional reviews
Distribution of work not done according to the skill sets of the team members	Determination of the skill sets of each team member	Distribution of work should be in accordance with the determined skill sets of each member	Redistributing the work in accordance with the team members' skill sets.
Inexperience in first hand planning for big software development projects	Proper study of and getting familiar with the process of planning and development of software projects on a large scale	Maintaining discipline and adhering to the defined process of software development and planning for the project	Find external help from someone experienced in planning and developing big software projects
Incompatibility errors on integration of two different development environments	Getting familiar with the development environments and their interaction with each other	Testing the interface between the two development environments on a small scale before integration	Review of the integration process and determination of the source of unwanted results

Android application crash	Using exception handlers	Using exception handlers	Restart application and find out why it crashed
Unavailability of GPS or GPRS	-	Maintaining a local database on the Android device that will store the data temporarily until it is uploaded successfully to server	The local database on the Android device will store the data not uploaded to server due to lack of GPRS connection
Coordinator not adjustable with the Android application or device	Building a user-friendly and simple application that the coordinators can understand	Building a lucid and user friendly User Manual for the Android application	Briefly training the coordinators on how to use the application and device
Battery of Android device getting drained quickly	Building an application that consumes less power	Reducing the time for which internet connection is required	Inform the coordinators on how to use the Android device or application so that less power is consumed

## 6. RISK MONITORING AND CONTROL

Planned risk responses are executed as required over the life cycle of the project, but the project should also be continuously monitored for new and changing risks. During risk monitoring and control the following tasks are performed:

- Identification, analysis, and planning for new risks
- Keeping track of identified risks and monitor trigger conditions
- Reviewing project performance information (such as progress/status reports, issues, and corrective actions)
- Re-analyzing existing risks to see if the probability, impact, or proper response plan has changed
- Reviewing the execution of risk responses and analyzing their effectiveness

Risk statuses assigned to each risk in the table shown below are referred from the Risk Status section in the Appendix which defines the valid risk statuses.

<b>Risk</b>	<b>Monitoring and Control</b>	<b>Risk Status</b>
Indetermination of problem size	Changes should be made in design structure of the product and accordingly in design documents and project plan.	Planning complete
Not understanding the exact requirements of the NGO	Continuous feedbacks from NGO on requirements gathered	Resolved
Difficulty in meeting the deadlines	Systematic management and distribution of time and resources and working accordingly to meet the deadlines	Planning complete
Unrealistic deadlines for deliverables	No. of days to be taken as buffer before the deadlines and project timeline should be modified accordingly	Resolved
Not following the process defined for development	Proper monitoring of the work done and getting the work done within the std. of the process	Resolved
Wrong selection of the Software Development Life Cycle to complete the project in the given time and with the given team members	Management and review of the work already completed and determining the course of action for the remaining work to be completed	Retired
Lack of experience/training in using software tools and technologies	Work should be distributed amongst the members on the basis of the skills set and if possible learn them in proper time due	Retired
Timely availability of low cost Android device for testing	Use Android emulator for testing	Planning complete
Complexity and newness in android application	Properly getting familiar with the project and its	Resolved



development, social mapping and client-server interface	technologies as soon as possible	
Unavailability of team members	Work should be transferred to other members as soon as possible and proper monitoring of the project work done by every team member	Resolved
Conflict among team members	Proper understanding between the team members and proper meetings to be held for resolving issues	Retired
Inconsistent documents and reviews	Proper and frequent monitoring and reviewing of all the documents	Resolved
Distribution of work not done according to the skill sets of the team members	Proper monitoring and planning of the project work distribution according to the skills set of members	Retired
Inexperience in first hand planning for big software development projects	Finding external or supervisory help in context to the project and its working	Planning complete
Incompatibility errors on integration of two different development environments	Integrate the modules as soon as they are made rather than integrating them at once in the end	Resolved
Android application crash	Build a robust application and use exception handlers and test the application for various scenarios and constraints	Planning complete
Unavailability of GPS or GPRS	A local database on the Android device stores data until a stable connection is established for uploading data to server	Planning complete
Coordinator not adjustable with the Android application or	Building a user-friendly application and a detailed	Retired

device	User Manual for the Android application in a simple and lucid manner	
Battery of Android device getting drained quickly	Building an application that consumes less power and requires less internet connection time	Planning complete

This data has been referred from the Risk Status definitions in Appendix.

**APPENDIX:****RISK AREA CHECKLIST:**

The risk area checklist is used to identify risks according to their risk areas defined as:

Product Size: This risk area involves all the risks associated with the overall size of the software to be built or modified

Business Impact: This risk area includes all the risks possible due to constraints imposed by the management or the market

Customer Characteristics: This risk area involves all the risks associated with interactions with the customer

Process Definition: This risk area deals with the degree to which the process has been defined and is being followed in the development or modification of the software

Development Environment: This risk area deals with all the risks associated with the availability and quality of the software tools and technologies to be used for software development

Technology to be built: This risk area includes the risks associated with building a complex system employing new technology not yet existing in the market

Staff Size and Experience: This area involves risks related to the overall technical and project experience of the software engineers

Performance Risk: This area involves risks associated with the product meeting its requirements and being fit for its intended use

**RISK PROBABILITY:**

The following chart shows risk probability definitions. During risk analysis the potential likelihood that a given risk will occur is assessed, and an appropriate risk probability is selected from the chart below.

Probability Category	Probability	Description
Very High	0.90	Risk event expected to occur
High	0.70	Risk event more likely than not to occur

Probable	0.50	Risk event may or may not occur
Low	0.30	Risk event less likely than not to occur
Very Low	0.10	Risk event not expected to occur

**Table-1: risk probability table****RISK IMPACT:**

The following chart shows risk impact definitions across each of the potentially impacted project areas (cost, schedule, scope, and quality). During risk analysis the potential impact of each risk is analyzed, and an appropriate impact level (0.05, 0.10, 0.20, 0.40, or 0.80) is selected from the chart below.

Impact Level Value	Impact Level	Impact Description	Stakeholder Concern
0.05	Very Low	Negligible impact on the team's strategy or operational activities	Negligible or absent
0.10	Low	Small impact on the team's strategy or operational activities	Less
0.20	Moderate	Considerable impact on the team's strategy or operational activities	Considerable
0.40	High	Significant impact on the team's strategy or operational activities	Significant
0.80	Very High	Disastrous impact on the team's strategy or operational activities	Disastrous

**RISK PROBABILITY AND IMPACT MATRIX:**

The risk probability and impact matrix shows the combination of risk impact and probability, and is utilized to decide the relative priority of risks. Risks that fall into the red-shaded cells of the matrix are the highest priority, and should receive the majority of risk management resources during response planning and risk monitoring/control. Risks that fall into the yellow-shaded cells of the matrix are the next highest priority, followed by risks that fall into the green-shaded cells.

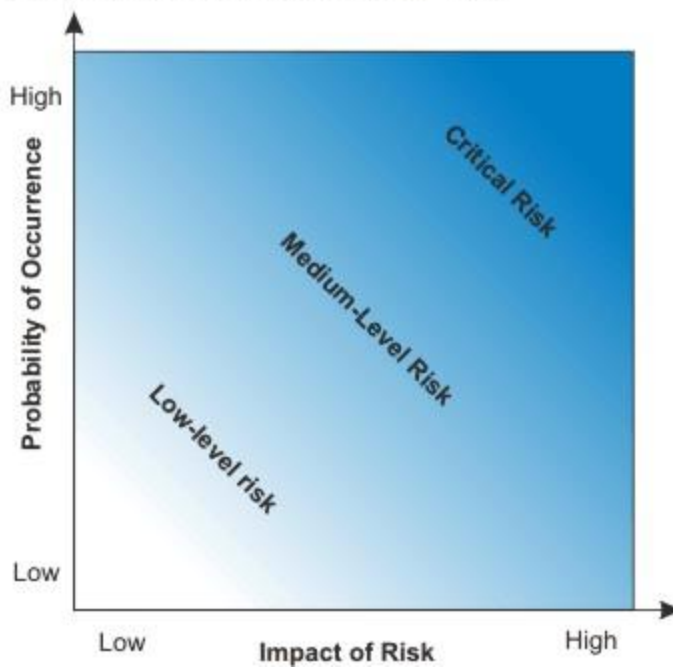
Probability	Threats				
Almost certain	0.05	0.09	0.18	0.36	0.72
Likely	0.04	0.07	0.14	0.28	0.56
Possible	0.03	0.05	0.10	0.20	0.40
Unlikely	0.02	0.03	0.06	0.12	0.24
Rare	0.01	0.01	0.02	0.04	0.08

**Table-2: risk probability and impact matrix.**

The corners of the chart have these characteristics:

- **Low impact/Low probability** – Risks in the bottom left corner are low level, and you can often ignore them.
- **Low impact/High probability** – Risks in the top left corner are of moderate importance – if these things happen, you can cope with them and move on. However, you should try to reduce the likelihood that they'll occur.
- **High impact/Low probability** – Risks in the bottom right corner are of high importance if they do occur, but they're very unlikely to happen. For these, however, you should do what you can to reduce the impact they'll have if they do occur, and you should have **contingency plans** in place just in case they do.
- **High impact/High probability** – Risks towards the top right corner are of critical importance. These are your top priorities, and are risks that you must pay close attention to.

Figure 1: The Risk Impact/Probability Chart



## RISK STATUS:

The risk status assigned to each risk changes over the project's life cycle. The risk statuses are defined as:

Analysis complete – Risk analysis is done but response planning not yet performed.

Planning complete – Response planning complete

Triggered – Risk trigger has occurred and threat has been realized.

Resolved – Realized risk has been contained.

Retired – Identified risk no longer requires active monitoring, that is, the risk trigger has passed.