



## **Risk Management Overview**

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# 1. Document Overview

## 1.1. Purpose

The purpose of this document is to provide a checklist of risk items to take into consideration when establishing project risk and the probability of the identified risk(s) occurring on the project. It also contains some high-level risk avoidance and contingency planning actions that may be taken in order to minimize the impact that the risk item may have on the project.

## 1.2. Objective

The objectives of this document are to:

- Identify all possible risks that may impact on a project.
- Identify risk avoidance and risk contingency planning activities that may significantly reduce the impact of the identified risks on a project.
- To assist project teams in controlling project risks.

[Risk Spreadsheet Template](#)

## 2. Introduction

Risk Management is the control of risks to increase the probability of project success. Risk management encompasses:

- The identification of risk issues,
- Risk assessment to define probability and impacts,
- The preparation and implementation of risk avoidance and risk contingency plans, and
- The continuous monitoring of those actions to ensure effectiveness.

Risk management is accomplished by the project team and is a key aspect of managing a project

**Risk Assessment** involves determining what risks exist, their probability of occurring and the impact on the project or organization.

**Risk Avoidance** involves preparing a plan that describes the actions to be taken to avoid the risks.

**Risk Contingency** involves preparing a plan that describes the alternative actions to be taken if any of the risk impacts do occur.

The decision to prepare risk avoidance and risk contingency plans depends on the circumstances associated with each project. In most cases these plans should be prepared for a specific area of risk if:

- The risk is moderate or high,
- The probability of occurring is moderate or high, and
- The impact is significant.

If any one of these factors is not present for an area of risk, it **may** not be necessary to prepare risk avoidance measures or a risk contingency plan. A low probability of risk but high impact situation should not be ignored.

Most of the risk areas center around the following:

- Resources (e.g., personnel, facilities, hardware, etc.),
- Requirements definition & scope,
- Technology, and
- External dependencies.

The table on the following page describes the potential risk factors, their levels of risk, and the possible actions to be considered when preparing risk avoidance and risk

contingency plans. It is intended as a tool to assist project teams when performing risk management activities. It is not a definitive guideline and should not be treated as an all encompassing template or standard.

## 3. Steps

### 3.1. Risk Assessment and Management Planning

This component of risk management should take place during the planning stages of a project. The entire team should be involved in the risk assessment sessions. To effectively conduct a risk assessment, follow these steps:

Identify project risks and develop a priority list.

- As a group, identify risk factors by major risk attribute. For example, a major risk attribute might be the attribute *Technical*. A risk that might be identified during the facilitated session is that the organization has little experience with the technology involved in the project.
- Continue this process through all risk attributes. Assign one individual to enter the information into the Risk Spreadsheet.

**Perform early filtering of risk issues** by removing risks that have a low probability of occurring or that will have a low impact on the project, should the issue occur. Retain any risk that has a medium or high probability or impact, or that is a potential 'project stopper.'

**Perform risk assessment** for the remaining risk issues by identifying the probability and impact (using the risk table).

- Using the risk spreadsheet team members will rank the probability of failure and the impact for each of the identified risk factors. They will do this ranking on their own and then turn in their spreadsheets.
- Rolling all of the evaluations together, use the Risk Spreadsheet to calculate the probability of failure and impact of failure for each risk identified. Be aware that risks may have cost, schedule, quality and/or technical and performance impacts.
- Return each individuals spreadsheet.
- As a group, discuss the scoring of each risk and identify those that must be added to the priority list.

**Develop risk avoidance and contingency plans** for each remaining risk issue by define an owner for each risk issue. Identify a person on the project team (preferably the project manager or team leader) to act as the risk manager in order to ensure consistent tracking of all risk issues. Owners will build plans to resolve their assigned risks.

The levels at which a risk area requires a risk management plan (both in terms of avoidance and contingency planning) depend on the requirements of each project. The team will determine this.

### **3.2. Risk Management Control**

This component of risk management forms part of the day-to-day management of the project. It contains the following steps:

- **Implement risk avoidance actions** in accordance with the risk plan.
- **Implement risk contingency actions** in accordance with the risk plan, if risk avoidance does not occur.
- **Report on each risk issue** during progress reporting (internal to the project and at management level. Develop corrective actions to project costs, schedule, quality, technical and/or performance as needed.
- **Monitor and analyze the effectiveness** of each risk control action. Modify or replace any actions that are ineffective.
- **Periodically update the list of managed risks** by ‘dropping’ risk issues that have been avoided or no longer pose a real threat to the project. Add new risk issues as they surface during the project. Periodically review the risk probability and impact information to ensure that this information remains current and accurate.

## 4. Risk Factors, Impact and Avoidance Criteria

### 4.1. Organizational Risk Factors

#### 4.1.1. Interactions - with internal & external groups -adds coordination & communication

No Risk	Single organization.
Low Risk	Multiple organizations, but no iterations required.
Moderate Risk	Multiple organizations, few iterations required.
High Risk	Multiple organizations, many iterations required.
<i>Avoidance Actions</i>	As early in the project as possible, identify all people and groups with whom interactions will occur and establish an appropriate means of communicating with them whenever it is necessary. Contact the Delta Project Office, Methods & Techniques or the Strategy & Integration Group to aid you in the identification.
<i>Contingency Actions</i>	Contact people and groups who may have been missed and bring them up-to-date, as soon as this situation is identified.

#### 4.1.2. Dependence - on other projects

Low Risk	Not dependent on other projects.
Moderate Risk	Dependent on one other project.
High Risk	Dependent on more than one other project.
<i>Avoidance Actions</i>	Identify the preceding project(s), contact and keep in touch with their project managers or leaders, review their project plans, track their progress in so far as such progress affects your project.
<i>Contingency Actions</i>	Build additional time into project plans to allow for the possibility that preceding projects may delay initiation/continuation of the affected project.

### 4.1.3. Interfaces - to other systems

No Risk	There are no interfaces to other systems.
Low Risk	The system provides data to other systems, or interfaces are relatively simple.
Moderate Risk	The system receives data from other systems, or interfaces are moderately complex.
High Risk	The system provides data to & receives data from other systems, or interfaces are many & complex.
<i>Avoidance Actions</i>	Identify the preceding project(s), contact and keep in touch with their project managers or leaders, review their project plans, track their progress in so far as such progress affects your project. Ensure that the data structures are compatible, the timing for passing data is appropriate to the run schedules.
<i>Contingency Actions</i>	If an interface is identified deep into the project life cycle, it may be necessary to develop and implement manual procedures or assign staff to develop appropriate interface program logic.

### 4.1.4. Decision Making - Will responsible parties make decisions quickly and decisively?

Low Risk	Decisions made by small group & finalized in days.
Moderate Risk	Decisions made by larger group and may take weeks to finalize.
High Risk	It is unclear who will make decisions.
<i>Avoidance Actions</i>	Identify the key stakeholders in management and make sure that those who can make decisions are involved.
<i>Contingency Actions</i>	If important decisions are not being made in a timely manner and this affects the project itself or its schedule, it may be necessary to revise the project scope (probably reduce it), extend the target date or take the issue to the project sponsor or a higher level of management.

### 4.1.5. Project Sponsor - Will the project sponsor play a highly active role?

Low Risk	Will coordinate decision making and will direct the project manager.
Moderate Risk	Will liaise with the project manager on key issues.

High Risk	Maintains an arms length relationship.
<i>Avoidance Actions</i>	Be as proactive as possible and do whatever you can to involve the project sponsor (e.g., send status reports, schedule status meetings, follow up on requests).
<i>Contingency Actions</i>	If important decisions are not being made in a timely manner and this affects the project itself or its schedule, it may be necessary to revise the project scope (probably reduce it), extend the target date or take the issue to a higher level of management.

**4.1.6. Resources - availability and/or possible over-commitment**

No Risk	Adequate dedicated resources always available.
Low Risk	Adequate resources always available but quantity is limited.
Moderate Risk	Occasional contention for resources.
High Risk	Frequent contention for resources.
<i>Avoidance Actions</i>	Determine the roles and skill levels needed by phase, and date when possible, as early as possible. Identify the available resources needed to fill those roles as early as possible. Begin the process to hire or contract for the necessary resources as early as possible and practical. Adjust the project schedule and scope to fit the resources who will be available.
<i>Contingency Actions</i>	Determine which project tasks are on the critical path and borrow staff from other non-critical tasks to work on tasks that are in danger of slipping. Try to get additional resources that you need as soon as resource availability problems are detected. Schedule overtime when necessary and as soon as the need for it is recognized. Adjust the project schedule and scope when no other reasonable option is available.

**4.1.7. Expertise - quality, quantity, availability, continuity of subject matter experts (SMEs)**

Low Risk	Expert personnel readily available.
Moderate Risk	Experienced personnel usually available.
High Risk	Experienced personnel must be shared beyond their availability.
<i>Avoidance</i>	Try to identify other, appropriate SMEs who will be available when

*Actions* needed. The Project Manager or Leader should meet with those for other projects needing the same SMEs to work out a schedule where the contention for the SMEs is reduced as much as possible. Adjust the project schedule and scope when no other reasonable option is available.

*Contingency Actions* Same as the Avoidance Actions.

**4.1.8. Location of Participants - Are participants located on site or at remote sites**

Low Risk All team and business participants are co-located at one site.

Moderate Risk Team and business participants are not co-located, but access is easy and available when needed.

High Risk Team and business participants are not co-located and travel/communication is difficult/inconvenient.

*Avoidance Actions* As early as possible, work with participants to identify the most effective means of communication and working together. Plan only those face-to-face meetings that are absolutely necessary. Try to arrange for meetings when all or most of the participants will be in town for other reasons to reduce the need for travel.

*Contingency Actions* Same as the Avoidance Actions.

**4.1.9. Training Available - for users of the system being developed**

No Risk Classroom training and mentoring will be available when needed.

Low Risk Self-paced training and mentoring will be available when needed.

Moderate Risk Classroom or self-paced training will be available, but no mentoring.

High Risk Self-paced training or mentoring is available, but not both.

Extreme Risk No training or mentoring is available.

*Avoidance Actions* Try to get the appropriate level of training included in the contract with any vendor of software packages being acquired. Arrange with the vendor for a train-the-trainer program to develop in-house expert trainers/mentors. If the system is developed in-house: assign an ASC Associate, or hire a new Associate or 3rd party consultant, to

develop a training program (classroom or self-paced); assign an Associate with training skills, or hire a new Associate or 3rd party consultant, to conduct training.

*Contingency Actions* Same as the Avoidance Actions. Identify and assign appropriate team members to work with users and mentor them until they develop sufficient working knowledge of the system. If necessary, delay the implementation date until training can be provided. As a last resort, cancel the project.

**4.2. Project Oriented Risk Factors**

**4.2.1. Project Manager/Leader Experience - with projects of the same type**

Low Risk Has successfully managed a similar project.

Moderate Risk Has played a senior role on a similar project & has project management experience.

High Risk Has not worked on similar project or has little project management experience.

*Avoidance Actions* If available, provide training (class or self-paced) for the project manager/leader. Get a project manager/leader who has the appropriate experience, from within if possible or hire one if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project(s).

*Contingency Actions* Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer under a less experienced project manager/leader.

**4.2.2. Developer Experience - with projects of the same type**

No Risk All or most team members have had experience.

Low Risk Some team members have had experience & some are familiar.

Moderate Risk Few or no team members have had experience, but some are familiar.

High Risk Few or no team members have had experience or are familiar.

*Avoidance Actions*                    If available, provide training (class or self-paced) for the sub-project team leaders and/or team members. Get a project manager/leader or senior team member who can mentor the team. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project(s).

*Contingency Actions*                Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced team members.

**4.2.3. Team Experience - with methodology to be used**

No Risk                                All or most team members have had experience.

Low Risk                                Some team members have had experience & some are familiar.

Moderate Risk                        Few or no team members have had experience, but some are familiar.

High Risk                                Few or no team members have had experience or are familiar.

*Avoidance Actions*                    If available, provide training (class or self-paced) for the project manager/leader, sub-project team leaders and/or team members. Get a project manager/leader or senior team member who can mentor the team. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead assigned sub-project(s).

*Contingency Actions*                Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced team members.

**4.2.4. Team Experience - with development tools to be used**

No Risk                                All or most team members have had experience.

Low Risk                                Some team members have had experience & some are familiar.

Moderate Risk	Few or no team members have had experience, but some are familiar.
High Risk	Few or no team members have had experience or are familiar.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the project manager/leader, sub-project team leaders and/or team members. Get a project manager/leader or senior team member who can mentor the team. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project(s).
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced team members.

**4.2.5. Project Objectives - are project objectives clearly defined & well understood**

Low Risk	Objectives are clearly defined, and well understood & agreed upon by management.
Moderate Risk	Objectives are defined, but not well understood & agreed upon.
High Risk	There is confusion over project objectives.
<i>Avoidance Actions</i>	Do not go forward on the project until its objectives are clearly defined, well understood and agreed upon by all stakeholders. Conduct a facilitated meeting, preferably using the Joint Development Approach (JDA) technique developed by Advanced Strategies, Inc. and adopted by ASC, with all the stakeholders to define and agree upon the objectives. Obtain strategic direction directives from senior management levels in order to define project objectives. Cancel the project if necessary.
<i>Contingency Actions</i>	Same as the Avoidance Actions.

**4.2.6. Training Available - for team members in technology, methodology & development tools**

No Risk	Classroom training and mentoring is available when needed.
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Low Risk	Self-paced training and mentoring is available when needed.
Moderate Risk	Classroom or self-paced training is available, but no mentoring.
High Risk	Self-paced training or mentoring is available, but not both.
Extreme Risk	No training or mentoring is available.
<i>Avoidance Actions</i>	Get a project manager/leader or senior team member who can mentor the team. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project(s). Contract training to an external entity to provide required training to team members or selected team members who will then train/mentor other team members.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained team members.

**4.2.7. Size of Project - in terms of team size and project duration**

Low Risk	Under 6 team members and under 6 months duration.
Moderate Risk	6 to 9 team members or 6 to 12 months duration.
High Risk	Over 9 team members or over 12 months duration.
<i>Avoidance Actions</i>	Split the project into sub-projects along functional or subject lines, where each sub-project will have under 6 team members and take under 6 months to complete. Provide additional project management skills.
<i>Contingency Actions</i>	Same as the Avoidance Actions.

**4.2.8. Platforms - required for development**

Low Risk	System to be developed for a single platform.
Moderate Risk	System to be developed for 2 target platforms.
High Risk	System to be developed for more than 2 target platforms.

*Avoidance Actions*                      If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.

*Contingency Actions*                      Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

**4.3. Resources by Phase of Development Risk Factors**

**4.3.1. Regarding the phase for project planning and scoping**

No Risk                      Extensive experience, proven track record.

Low Risk                      Limited experience.

Moderate Risk                      Familiarity with, but never involved before.

High Risk                      No familiarity or experience.

*Avoidance Actions*                      If available, provide training (class or self-paced) for the sub-project team leaders and/or team members. Get a project manager/leader or senior team member who can mentor the team. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.

*Contingency Actions*                      Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

**4.3.2. Regarding the phase for analysis**

No Risk                      Extensive experience, proven track record.

Low Risk                      Limited experience.

Moderate Risk	Familiarity with, but never involved before.
High Risk	No familiarity or experience.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the sub-project team leaders and/or team members. Get a project manager/leader or senior team member who can mentor the team. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

#### 4.3.3. Regarding the phase for design

No Risk	Extensive experience, proven track record.
Low Risk	Limited experience.
Moderate Risk	Familiarity with, but never involved before.
High Risk	No familiarity or experience.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the sub-project team leaders and/or team members. Get a project manager/leader or senior team member who can mentor the team. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

#### 4.3.4. Regarding the phase for construction

No Risk	Extensive experience, proven track record.
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Low Risk	Limited experience.
Moderate Risk	Familiarity with, but never involved before.
High Risk	No familiarity or experience.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the sub-project team leaders and/or team members. Get a project manager/leader or senior team member who can mentor the team. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

**4.3.5. Regarding the phase for testing**

No Risk	Extensive experience, proven track record.
Low Risk	Limited experience.
Moderate Risk	Familiarity with, but never involved before.
High Risk	No familiarity or experience.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the sub-project team leaders and/or team members. Get a project manager/leader or senior team member who can mentor the team. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

### 4.3.6. Regarding the phase for implementation

No Risk	Extensive experience, proven track record.
Low Risk	Limited experience.
Moderate Risk	Familiarity with, but never involved before.
High Risk	No familiarity or experience.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the sub-project team leaders and/or team members. Get a project manager/leader or senior team member who can mentor the team. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

## 4.4. Environmental Risk Factors

### 4.4.1. Environment Availability

Low Risk	Installed, stable and currently available.
Moderate Risk	Some installation required.
High Risk	Major installation required.
<i>Avoidance Actions</i>	Hire or contract with experts who can speed up the installation and make the environment stable and available when needed. Ensure that support structures (telephonic help, expert support, service level agreements, etc.) are in place to counteract problems experienced during the initial days after installation.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date sufficiently to ensure that the environment has been installed and stabilized for testing and implementation.

#### 4.4.2. The Environment Itself - for analysis/design/construction

No Risk	Singular, very simple, straightforward and integrated.
Low Risk	Varied environment, but well integrated.
Moderate Risk	Varied environment, but not well integrated.
High Risk	Ad hoc environment.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

#### 4.4.3. The Environment Itself - for testing

No Risk	Singular, very simple, straightforward and integrated.
Low Risk	Varied environment, but well integrated.
Moderate Risk	Varied environment, but not well integrated.
High Risk	Ad hoc environment.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

#### 4.4.4. The Environment Itself - for acceptance

No Risk	Singular, very simple, straightforward and integrated.
Low Risk	Varied environment, but well integrated.
Moderate Risk	Varied environment, but not well integrated.
High Risk	Ad hoc environment.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

#### 4.4.5. The Environment Itself - for production/implementation

No Risk	Singular, very simple, straightforward and integrated.
Low Risk	Varied environment, but well integrated.
Moderate Risk	Varied environment, but not well integrated.
High Risk	Ad hoc environment.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

#### 4.4.6. Developer Experience With Environment - for analysis/design/construction

No Risk	Extensive experience, proven track record.
Low Risk	Limited experience.
Moderate Risk	Familiar with, but never used.
High Risk	No familiarity or experience.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

#### 4.4.7. Developer Experience With Environment - for testing

No Risk	Extensive experience, proven track record.
Low Risk	Limited experience.
Moderate Risk	Familiar with, but never used.
High Risk	No familiarity or experience.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

#### 4.4.8. Developer Experience With Environment - for acceptance

No Risk	Extensive experience, proven track record.
Low Risk	Limited experience.
Moderate Risk	Familiar with, but never used.
High Risk	No familiarity or experience.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

#### 4.4.9. Developer Experience With Environment - for production

No Risk	Extensive experience, proven track record.
Low Risk	Limited experience.
Moderate Risk	Familiar with, but never used.
High Risk	No familiarity or experience.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

#### 4.4.10. Stability of the Environment - for analysis/design/construction

No Risk	No recent changes, none planned.
Low Risk	Only infrequent and well-planned changes.
Moderate Risk	More frequent and impromptu changes.
High Risk	Unplanned changes occur constantly.
<i>Avoidance Actions</i>	Arrange with management of the appropriate area (i.e., Technology Services, Technical Services, In-Store Technology) to stop making changes to the design, testing and production environment just before and during design, testing and implementation respectively. Coordinate with the appropriate management to ensure that you can work around any changes being made to the environment.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date sufficiently to cover delays in testing and implementation caused by changes made to the environment.

#### 4.4.11. Stability of the Environment - for testing

No Risk	No recent changes, none planned.
Low Risk	Only infrequent and well-planned changes.
Moderate Risk	More frequent and impromptu changes.
High Risk	Unplanned changes occur constantly.
<i>Avoidance Actions</i>	Arrange with management of the appropriate area (i.e., Technology Services, Technical Services, In-Store Technology) to stop making changes to the design, testing and production environment just before and during design, testing and implementation respectively. Coordinate with the appropriate management to ensure that you can work around any changes being made to the environment.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date sufficiently to cover delays in testing and implementation caused by changes made to the environment.

#### 4.4.12. Stability of the Environment - for acceptance

No Risk	No recent changes, none planned.
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Low Risk	Only infrequent and well-planned changes.
Moderate Risk	More frequent and impromptu changes.
High Risk	Unplanned changes occur constantly.
<i>Avoidance Actions</i>	Arrange with management of the appropriate area (i.e., Technology Services, Technical Services, In-Store Technology) to stop making changes to the design, testing and production environment just before and during design, testing and implementation respectively. Coordinate with the appropriate management to ensure that you can work around any changes being made to the environment.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date sufficiently to cover delays in testing and implementation caused by changes made to the environment.

**4.4.13. Stability of the Environment - for production**

No Risk	No recent changes, none planned.
Low Risk	Only infrequent and well-planned changes.
Moderate Risk	More frequent and impromptu changes.
High Risk	Unplanned changes occur constantly.
<i>Avoidance Actions</i>	Arrange with management of the appropriate area (i.e., Technology Services, Technical Services, In-Store Technology) to stop making changes to the design, testing and production environment just before and during design, testing and implementation respectively. Coordinate with the appropriate management to ensure that you can work around any changes being made to the environment.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date sufficiently to cover delays in testing and implementation caused by changes made to the environment.

**4.4.14. Equipment Available - for analysis/design/construction**

No Risk	Equipment (e.g., servers, gateways, CPUs, processor memory, auxiliary storage, telephone lines, power) is operational and available as required for the project.
Low Risk	Most equipment is available and operational. The remainder is

installed and should be operational when needed.

**Moderate Risk** Some equipment is available and operational. Some equipment is installed and should be operational when needed. Some equipment has yet to be installed and it is not known if it will be operational when needed.

**High Risk** Most or all the equipment has yet to be installed and it is not known if it will be operational when needed.

*Avoidance Actions* Hire or contract with experts who can speed up the installation and make the environment stable and available when needed. If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.

*Contingency Actions* Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

**4.4.15. Equipment Available - for testing**

**No Risk** Equipment (e.g., servers, gateways, CPUs, processor memory, auxiliary storage, telephone lines, power) is operational and available as required for the project. Very easy and instinctive tools, used before and integrated as necessary

**Low Risk** Most equipment is available and operational. The remainder is installed and should be operational when needed. Many, stand-alone tools

**Moderate Risk** Some equipment is available and operational. Some equipment is installed and should be operational when needed. Some equipment has yet to be installed and it is not known if it will be operational when needed. Ad hoc, undocumented, unfamiliar tools

**High Risk** Most or all the equipment has yet to be installed and it is not known if it will be operational when needed. Few or no tools available

*Avoidance Actions* Hire or contract with experts who can speed up the installation and make the environment stable and available when needed. If available, provide training (class or self-paced) for the technical staff.

Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.

**Contingency Actions** Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

#### 4.4.16. Equipment Available - for acceptance

**No Risk** Equipment (e.g., servers, gateways, CPUs, processor memory, auxiliary storage, telephone lines, power) is operational and available as required for the project. Very easy and instinctive tools, used before and integrated as necessary

**Low Risk** Most equipment is available and operational. The remainder is installed and should be operational when needed. Many, stand-alone tools

**Moderate Risk** Some equipment is available and operational. Some equipment is installed and should be operational when needed. Some equipment has yet to be installed and it is not known if it will be operational when needed. Ad hoc, undocumented, unfamiliar tools

**High Risk** Most or all the equipment has yet to be installed and it is not known if it will be operational when Needed. Few or no tools available

**Avoidance Actions** Hire or contract with experts who can speed up the installation and make the environment stable and available when needed. If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.

**Contingency Actions** Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

#### 4.4.17. Equipment Available - for production

No Risk	Equipment (e.g., servers, gateways, CPUs, processor memory, auxiliary storage, telephone lines, power) is operational and available as required for the Project. Very easy and instinctive tools, used before and integrated as necessary
Low Risk	Most equipment is available and operational. The remainder is installed and should be operational when Needed. Many, stand-alone tools
Moderate Risk	Some equipment is available and operational. Some equipment is installed and should be operational when needed. Some equipment has yet to be installed and it is not known if it will be operational when Needed. Ad hoc, undocumented, unfamiliar tools
High Risk	Most or all the equipment has yet to be installed and it is not known if it will be operational when Needed. Few or no tools available
<i>Avoidance Actions</i>	Hire or contract with experts who can speed up the installation and make the environment stable and available when needed. If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

#### 4.4.18. Tools Available - for analysis/design/construction

No Risk	A few, integrated, very easy to learn and use and instinctive tools (e.g., process management, project scheduling, CASE, debuggers, programming languages, RDBMS, utilities), used before.
Low Risk	Many tools, most integrated but some stand-alone, most familiar and easy to learn and use but some not so easy or familiar.
Moderate Risk	Many ad hoc, undocumented, difficult to learn and use, and/or unfamiliar tools.

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High Risk	Few or no tools available.
<i>Avoidance Actions</i>	Obtain the required or desired tools through the IT Information Management Department (Bob Southard) and arrange for the appropriate level of training. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
Contingency Actions	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

**4.4.19. Tools Available - for testing**

No Risk	A few, integrated, very easy to learn and use and instinctive tools (e.g., process management, project scheduling, CASE, debuggers, programming languages, RDBMS, utilities), used before.
Low Risk	Many tools, most integrated but some stand-alone, most familiar and easy to learn and use but some not so easy or familiar.
Moderate Risk	Many ad hoc, undocumented, difficult to learn and use, and/or unfamiliar tools.
High Risk	Few or no tools available.
<i>Avoidance Actions</i>	Obtain the required or desired tools through the IT Information Management Department (Bob Southard) and arrange for the appropriate level of training. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

#### 4.4.20. Tools Available - for acceptance

No Risk	A few, integrated, very easy to learn and use and instinctive tools (e.g., process management, project scheduling, CASE, debuggers, programming languages, RDBMS, utilities), used before.
Low Risk	Many tools, most integrated but some stand-alone, most familiar and easy to learn and use but some not so easy or familiar.
Moderate Risk	Many ad hoc, undocumented, difficult to learn and use, and/or unfamiliar tools.
High Risk	Few or no tools available.
<i>Avoidance Actions</i>	Obtain the required or desired tools through the IT Information Management Department (Bob Southard) and arrange for the appropriate level of training. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

#### 4.4.21. Tools Available - for production

No Risk	A few, integrated, very easy to learn and use and instinctive tools (e.g., process management, project scheduling, CASE, debuggers, programming languages, RDBMS, utilities), used before.
Low Risk	Many tools, most integrated but some stand-alone, most familiar and easy to learn and use but some not so easy or familiar.
Moderate Risk	Many ad hoc, undocumented, difficult to learn and use, and/or unfamiliar tools.
High Risk	Few or no tools available.
<i>Avoidance Actions</i>	Obtain the required or desired tools through the IT Information Management Department (Bob Southard) and arrange for the appropriate level of training. Get a project manager/leader or senior team member who can mentor the staff. Get as many team

members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.

*Contingency Actions* Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

**4.4.22. Platform Previously Installed and Used**

Low Risk Platform was previously installed and is working well.

Moderate Risk Platform requires some additions.

High Risk Platform is new and this is the first application to use it.

*Avoidance Actions* Hire or contract with experts who can speed up the installation and make the environment stable and available when needed. If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.

*Contingency Actions* Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

**4.5. Product Technology Risk Factors**

**4.5.1. The Technology Itself - internal to the product/service**

No Risk Very simple, well known.

Low Risk Relatively simple, but not well known.

Moderate Risk Moderately complex.

High Risk	Very intricate.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

#### **4.5.2. The Technology Itself - relative to ultimate placement**

No Risk	Very simple, well known.
Low Risk	Relatively simple, but not well known.
Moderate Risk	Moderately complex.
High Risk	Very intricate.
<i>Avoidance Actions</i>	Hire or contract with experts who can speed up the installation and make the environment stable and available when needed. If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

#### **4.5.3. Developer Experience in that Technology - internal to the product/service**

No Risk	Extensive experience, proven track record.
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Low Risk	Limited experience.
Moderate Risk	Familiar with, but never used.
High Risk	No familiarity or experience.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

**4.5.4. Developer Experience in that Technology -relative to ultimate placement**

No Risk	Extensive experience, proven track record.
Low Risk	Limited experience.
Moderate Risk	Familiar with, but never used.
High Risk	No familiarity or experience.
<i>Avoidance Actions</i>	Hire or contract with experts who can speed up the installation and make the environment stable and available when needed. If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring. Consider splitting the project into sub-projects with team leaders who have sufficient experience to lead their assigned sub-project.
<i>Contingency Actions</i>	Same as the Avoidance Actions. Delay the implementation date because the project will likely take longer with less experienced and trained staff.

#### 4.5.5. Distributed Data Base Solution - Will the system provide a distributed data base?

Low Risk	No data distribution.
Moderate Risk	Simple data distribution with no distributed updates.
High Risk	More than simple distributed data or any distributed updates.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring.
<i>Contingency Actions</i>	Same as Avoidance Actions. Also, ensure that project plans contain adequate time for problem solution and additional time for installation and testing. Contingency and recovery plans should be in place to successfully manage unavailability of distributed data (e.g., alternative hardware facilities, manual procedures and forms). Delay the implementation date because the project will likely take longer.

#### 4.5.6. Distributed Processing Solution - Will the system provide distributed processing?

Low Risk	No distributed processing or remote presentation.
Moderate Risk	Small level of distributed processing, or remote function.
High Risk	Complex distributed processing, or distributed function.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring.
<i>Contingency Actions</i>	Same as Avoidance Actions. Also, ensure that project plans contain adequate time for problem solution and additional time for installation and testing. Contingency and recovery plans should be in place to successfully manage unavailability of distributed processing (e.g., alternative hardware and software facilities, manual procedures and forms). Delay the implementation date because the project will likely take longer.

**4.5.7. Multimedia Data - Will the system create multimedia clips (audio or video)?**

Low Risk	No multimedia data.
Moderate Risk	Small amount of multimedia or inclusion of existing multimedia.
High Risk	Development of multimedia clips.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring.
<i>Contingency Actions</i>	Same as Avoidance Actions. Delay the implementation date because the project will likely take longer.

**4.5.8. Unstructured Data Manipulation - Does the system manipulate unstructured data?**

Low Risk	Structured data only.
Moderate Risk	Small percentage of unstructured data.
High Risk	Largely unstructured data.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring.
<i>Contingency Actions</i>	Same as Avoidance Actions. Delay the implementation date because the project will likely take longer.

**4.5.9. Transaction/Interaction Complexity - Does the system involve complex transactions?**

Low Risk	Simple or straightforward transactions.
Moderate Risk	Moderate transaction complexity.

High Risk	Complex transactions.
<i>Avoidance Actions</i>	If available, provide training (class or self-paced) for the technical staff. Get a project manager/leader or senior team member who can mentor the staff. Get as many team members as possible who have the appropriate experience, from within if possible or hire if necessary. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring.
<i>Contingency Actions</i>	Same as Avoidance Actions. Delay the implementation date because the project will likely take longer.

## **4.6. Product Constraint Risk Factors**

### **4.6.1. Size - magnitude and/or actual number**

No Risk	Known not to be a problem.
Low Risk	Should not be a significant problem.
Moderate Risk	Likely to cause a problem.
High Risk	Possible only with extreme difficulty.
Show Stopper	Not doable.
<i>Avoidance Actions</i>	Hire or contract with experts who can speed up the development and installation. If available, provide training (class or self-paced) for the technical staff. Possibly, hire one or more consultants with the necessary project experience to provide guidance and mentoring.
<i>Contingency Actions</i>	Same as Avoidance Actions. Also, ensure that project plans contain adequate time for problem solution and additional time for installation and testing. Divide the project into sub-projects. Delay the implementation date because the project will likely take longer.

### **4.6.2. Timing - ability to be responsive to a timing requirement**

No Risk	Known not to be a problem.
Low Risk	Should not be a significant problem.
Moderate Risk	Likely to cause a problem.
High Risk	Possible only with extreme difficulty.

Show Stopper	Not doable.
<i>Avoidance Actions</i>	Ensure that project plans contain adequate time for problem solution and additional time for installation and testing. Divide the project into sub-projects. Delay the implementation date because the project will likely take longer.
<i>Contingency Actions</i>	Same as Avoidance Actions.

**4.6.3. Capacity - ability to handle volume**

No Risk	Known not to be a problem.
Low Risk	Should not be a significant problem.
Moderate Risk	Likely to cause a problem.
High Risk	Possible only with extreme difficulty.
Show Stopper	Not doable.
<i>Avoidance Actions</i>	Early on in the project, identify alternative solutions or corrective actions. Include sufficient time in project plans to allow for the investigation of alternative solutions. Alternative solutions may include organizing data differently, changing operating procedures or the acquisition of additional and/or alternative hardware and software.
<i>Contingency Actions</i>	Same as Avoidance Actions. Delay the implementation date because the project will likely take longer.

**4.6.4. Quality - required perfection**

No Risk	Known not to be a problem.
Low Risk	Should not be a significant problem.
Moderate Risk	Likely to cause a problem.
High Risk	Possible only with extreme difficulty.
Show Stopper	Not doable.
<i>Avoidance Actions</i>	Early on in the project, identify alternative solutions or corrective actions and enhancements that are required. Include sufficient time in project plans to allow for the investigation of alternative solutions

and for implementation and testing of modifications and enhancements.

*Contingency Actions* Same as Avoidance Actions. Delay the implementation date because the project will likely take longer. It may be necessary to accept the limitations imposed and find alternative ways of dealing with the problems encountered (e.g., manual procedures, changes in business processes).

**4.6.5. Synchronization - with other entities**

No Risk Known not to be a problem.

Low Risk Should not be a significant problem.

Moderate Risk Likely to cause a problem.

High Risk Possible only with extreme difficulty.

Show Stopper Not doable.

*Avoidance Actions* As early in the project as possible, identify all entities with which interactions will occur and establish an appropriate means of communicating with them as is necessary.

*Contingency Actions* Same as Avoidance Actions. Delay the implementation date because the project will likely take longer.

**4.6.6. Expandability - requirement to be able to grow**

No Risk Known not to be a problem.

Low Risk Should not be a significant problem.

Moderate Risk Likely to cause a problem.

High Risk Possible only with extreme difficulty.

Show Stopper Not doable.

*Avoidance Actions* As early in the project as is possible, identify any restrictions to growth and identify alternative solutions. Allow additional time in project plans to investigate alternative solutions. Negotiate with the product owner, the possibility of including growth requirements into future releases of the product.

*Contingency* Same as Avoidance Actions. Delay the implementation date because

*Actions* the project will likely take longer. It may be necessary to accept the limitations imposed and find alternative ways of dealing with the problems encountered (e.g., manual procedures, changes in business processes). If future enhancements have been agreed with the product owner, ensure that future upgrades of the product are properly planned for.

**4.6.7. Flexibility - ability to accommodate many options**

No Risk Known not to be a problem.

Low Risk Should not be a significant problem.

Moderate Risk Likely to cause a problem.

High Risk Possible only with extreme difficulty.

Show Stopper Not doable.

*Avoidance Actions* As early in the project as is possible, identify any restrictions to flexibility and identify alternative solutions. Allow additional time in project plans to investigate alternative solutions. Negotiate with the product owner, the possibility of including flexibility requirements into future releases of the product.

*Contingency Actions* Same as Avoidance Actions. Delay the implementation date because the project will likely take longer. It may be necessary to accept the limitations imposed and find alternative ways of dealing with the problems encountered (e.g., manual procedures, changes in business processes). If future enhancements have been agreed with the product owner, ensure that future upgrades of the product are properly planned for.

**4.6.8. Security - need for controls**

No Risk Known not to be a problem.

Low Risk Should not be a significant problem.

Moderate Risk Likely to cause a problem.

High Risk Possible only with extreme difficulty.

Show Stopper Not doable.

*Avoidance* As early in the project as is possible, identify any restrictions to

*Actions* security and identify alternative solutions. Allow additional time in project plans to investigate alternative solutions. Negotiate with the product owner, the possibility of including security requirements into future releases of the product.

*Contingency Actions* Same as Avoidance Actions. Delay the implementation date because the project will likely take longer. It may be necessary to accept the limitations imposed and find alternative ways of dealing with the problems encountered (e.g., manual procedures, changes in business processes). If future enhancements have been agreed with the product owner, ensure that future upgrades of the product are properly planned for.

#### **4.7. Project Constraint Risk Factors**

##### **4.7.1. Schedule - Mandated completion date**

No Risk Known not to be a problem.

Low Risk Should not be a significant problem.

Moderate Risk Likely to cause some additional difficulty problem.

High Risk Possible only with extreme difficulty.

Show Stopper Not doable.

*Avoidance Actions* Obtain additional project resources with relevant skills to be added to the project. It may be necessary to divert staff from other, less critical projects to the project.

*Contingency Actions* Same as the Avoidance Actions. As a last resort, obtain management approval to extend mandated dates.

##### **4.7.2. Schedule - Mandated milestone date**

No Risk Known not to be a problem.

Low Risk Should not be a significant problem.

Moderate Risk Likely to cause some additional difficulty problem.

High Risk Possible only with extreme difficulty.

Show Stopper Not doable.

*Avoidance Actions* Obtain additional project resources with relevant skills to be added to the project. It may be necessary to divert staff from other, less critical projects to the project.

*Contingency Actions* Same as the Avoidance Actions. As a last resort, obtain management approval to extend mandated dates.

**4.7.3. Staffing - Mandated number of people**

No Risk Known not to be a problem.

Low Risk Should not be a significant problem.

Moderate Risk Likely to cause some additional difficulty problem.

High Risk Possible only with extreme difficulty.

Show Stopper Not doable.

*Avoidance Actions* Obtain additional project resources with relevant skills to be added to the project. It may be necessary to divert staff from other, less critical projects to the project.

*Contingency Actions* Same as the Avoidance Actions. As a last resort, extend completion dates based on the availability of staff or cancel the project.

**4.7.4. Staffing - Mandated type of people**

No Risk Known not to be a problem.

Low Risk Should not be a significant problem.

Moderate Risk Likely to cause some additional difficulty problem.

High Risk Possible only with extreme difficulty.

Show Stopper Not doable.

*Avoidance Actions* Obtain additional project resources with relevant skills to be added to the project. It may be necessary to divert staff from other, less critical projects to the project.

*Contingency Actions* Same as the Avoidance Actions. As a last resort, extend completion dates based on the availability of staff or cancel the project.

#### 4.7.5. Budget - mandated budget

No Risk	Known not to be a problem.
Low Risk	Should not be a significant problem.
Moderate Risk	Likely to cause some additional difficulty or problem.
High Risk	Possible only with extreme difficulty.
Show Stopper	Not doable.
<i>Avoidance Actions</i>	Tailor the project scope (reduce width and/or depth) to a level acceptable to management and the business. Obtain approval to extend the budgets that have been set.
<i>Contingency Actions</i>	Same as the Avoidance Actions. If necessary, change the project schedule to proceed into an additional budgeting period, should this be acceptable to management and the funds will be available in a succeeding budgetary period.