

* Identifying the stakeholders

Normally Stakeholders includes all individuals and organizations that are impacted by the project. The Key Stakeholders includes executive management with an interest in the project and key users identified for participation in the project. Generally, Stakeholders include all individuals and organizations that are impacted by the project. Especially, the Key Stakeholders include executive management with an interest in the project and key users identified for participation in the project.

The following table shows the roles by key stakeholders including project team and sponsor related to the **‘The Last Chance’** project.

Table 1. Roles by key stakeholders related to **‘The Last Chance’** project

Stakeholders	Role
Governing Province (Organisation Section)	<ul style="list-style-type: none">▪ Establish basic plan and project diving guide▪ Deliberate management, evaluation and development plan by project.▪ Discuss cooperation plan for related work▪ Improvement and implementation of regulation and system
Population Organization	<ul style="list-style-type: none">▪ Share/decision making on issues/solutions of project▪ Expand and post-management of operation▪ Deliberate management, evaluation and development plan by project.▪ Discuss cooperation plan for related work
Users (Clients)	<ul style="list-style-type: none">▪ Give the exact user requirement
Task performer (System building group: ‘The Last Chance’)	<ul style="list-style-type: none">▪ System build and operation/spread, post-management▪ System establishment and system development▪ Management project progress and manpower

* Risk management

1. Risk Management Approach

The risk management process identifies potential risk ranged to the overall process of a project, analyzes potential influence and generation possibility on identified risk, and includes the methods and procedures that systematically execute risk mitigation activities for reducing risk properly. The risk and risk mitigation plan is traced until it is completed, and is propagated to an organization receiving its influence. The purpose of the risk management process is to previously identify risk capable of occurring during execution of a project, to minimize risk occurrence by establishing a management plan on risk with a high possibility of risk occurrence through analysis and assessment, and to systematically perform

the risk mitigation activity planned in case of risk occurrence.

2. Project Risk Knowledge Areas, Tools & technique, and Outputs by PMBOK(2021)

The following table 2 shows project risk knowledge areas, outputs, and related deliverables in this project.

Table 2. Project Risk Knowledge Areas, Tools & technique, and Outputs

Knowledge Area	Process	Input	Tools & techniques	Output
Project Risk Management	Plan Risk Management	Project Scope Statement Schedule Management Plan Communication Management Plan	Planning Meetings and Analysis	Risk Management Plan
	Identify Risks	Risk Management Plan Stakeholder Register Schedule Management Plan	Information Gathering Techniques: Brainstorming Expert Judgment	Risk Register
	Perform Qualitative Risk Analysis	Risk Register Risk Management Plan Project Scope Statement	Risk Probability and Impact Assessment Expert Judgment	Risk Register Updates: Relative ranking or priority list of project risks
	Plan Risk Responses	Risk Register Risk Management Plan	Strategies for Negative Risks or Threats Expert Judgment	Risk Register Updates Project Management Plan Update
	Monitor and Control Risks	Risk Register Project Management Plan	Risk Reassessment Risk Audits	Risk Register Updates

3. Risk Identification

Table 3. Risk identification

Summary	Identifies potential risk factors of a project, assesses influence, seriousness, probability of occurrence and expected time, etc. and proposes a method for managing risk.
Initiation Standard	The project has started.
Work Content	Perform a risk review meeting.

	<p>The project manager prepares a review meeting for understand potential risk factors of a project and selects participating manpower. Customers might participate the review meeting for forming a consensus on risk factors existent in the project.</p> <p>The risk review meeting utilizes a weekly/monthly official project team meeting or project process review meetings, etc., and executes a risk review meeting for understand risk factors when important changes of an important milestone or budget, scope and manpower occurred.</p> <p>Define potential risk factors</p> <p>The project manager explains potential risk domains of a project to participating manpower of the risk review meeting and provides "Risk Checklist (The Last Chance' -RK-01)" for identifying risk factors.</p> <p>Assesses potential risk factors</p> <p>The risk discoverer analyzes the root cause on identified potential risk factors, assesses influence, seriousness, probability of occurrence and expected time in aspects of the process, budget, quality, scope and technology and describes it in detail by utilizing "Risk Checklist (The Last Chance' -RK-C01)".</p> <p>The judgment criteria of influence, seriousness, probability of occurrence and expected time of potential risk factors are as follows.</p> <p>Influence: Process, Budget, Quality, Scope and Technology</p> <p>Seriousness: Urgent(4), Serious(3), Average(2), Insufficient(1)</p> <p>Probability of occurrence: Upper (more than 75%), Medium (25% ~ 75%), Lower (less than 25%)</p> <p>Expected time: Long-term, Medium-term, Short-term</p> <p>Reviews potential risk factors</p> <p>The project manager reviews identified potential risk factors with participating manpower of a risk review meeting and decides risk factors after integrating other risk factors or adjusting.</p> <p>The risk discoverer establishes a recommendable risk response method on decided risk factors by considering the aspects of the process, budget, quality, scope and technology, and describes it in detail by utilizing "Risk Management Plan (The Last Chance' -RK-F01)".</p>
Completion criterion	Decided risk by using a risk checklist
Measurement factors	Number of identified risks

4. Risk Analysis

Table 4. Risk analysis

Summary	Assesses importance on the grasped risk factors, decides a level of risk management based on this, and selects a risk manager.													
Initiation Standard	Grasped risk by using a risk checklist													
Work Content	<p>Assesses importance of the risk factors</p> <p>The risk manager reviews and decides importance of risk factors by considering seriousness of the probability of occurrence and influence of each risk factor.</p> <p>The criterion calculating the importance of risk factors is as follows.</p> <p>Risk Importance = Probability of Risk Occurrence * Seriousness of Influence</p> <p>Calculation of risk importance Example)</p> <p>When the probability of risk occurrence is 70%(0.7) and the seriousness of risk influence is "serious(3)",</p> <p>Risk Importance = Probability of Risk Occurrence * Seriousness of Influence = $0.7 * 3 = 2.10$</p> <p>Decides a level of risk factors.</p> <p>The risk manager decides the risk level based on the importance of risk factors.</p> <p>The judgment criteria deciding a level of risk factors are as follows.</p> <table border="1"> <thead> <tr> <th>Risk Level</th><th>Risk Importance</th><th>Explanation</th></tr> </thead> <tbody> <tr> <td>Very Low</td><td>Importance ≤ 0.8</td><td>When it has low or no influence on a project, and the probability of occurrence is very low or not important.</td></tr> <tr> <td>Low</td><td>$0.8 < \text{Importance} \leq 1.6$</td><td>When it has minute influence on a project, and the probability of occurrence is low or when there is a minute problem</td></tr> <tr> <td>Moderate</td><td>$1.6 < \text{Importance} \leq 2.4$</td><td>When there is a partial possibility having bad influence on a project, or when the probability of occurrence is high or all factors becoming a reason are necessary to be controlled</td></tr> </tbody> </table>		Risk Level	Risk Importance	Explanation	Very Low	Importance ≤ 0.8	When it has low or no influence on a project, and the probability of occurrence is very low or not important.	Low	$0.8 < \text{Importance} \leq 1.6$	When it has minute influence on a project, and the probability of occurrence is low or when there is a minute problem	Moderate	$1.6 < \text{Importance} \leq 2.4$	When there is a partial possibility having bad influence on a project, or when the probability of occurrence is high or all factors becoming a reason are necessary to be controlled
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High	2.4 < Importance ≤ 3.2	When there is a high possibility having bad influence on a goal, process and budget or when a project, or when the probability of occurrence is high or all factors becoming a reason are necessary to be controlled
Very High	3.2 < Importance	When there is a very high possibility having very serious influence on a goal, process and budget or when a project, or when the probability of occurrence is very high or all factors becoming a reason should be primarily controlled

Establishes a risk management strategy.

The risk manager decides a strategy for efficiently managing the identified risk.

Risk Management Strategy	Explanation
Avoidance	This is to revise a project plan to remove risk or circumstances or to protect a project goal from the influence of risk. Although a project cannot remove all risk accidents, any concrete risk can be avoided.
Transfer	This means to transfer the subject of the occurrence result and response of risk to the third party. The risk transfer means to simply pass managing responsibility to the third party and doesn't remove risk.
Mitigation	This is to reduce the probability and result of negative risk accidents as an acceptable starting point. What copes with it in an early period to reduce the probability of risk occurrence and influence on a project is much more effective than making efforts to repair the result after occurrence of risk.
Acceptance	This hints that a project team doesn't change a project plan to handle risk or cannot identify other proper risk coping strategy. The active acceptance can include development of an emergency plan if risk occurs. The passive acceptance means to leave the occurrence of risk as it is, so that a project team accepts the result straightly without any response.

	<p>The strategy for managing risk factors is as follows.</p> <p>Approves a Risk Management Plan.</p> <p>The risk manager registers important items described in "Risk Management Plan ('The Last Chance' -RK-F01)" such as risk factors and risk levels, etc. in "Risk Management Register".</p> <p>The project manager reviews the risk factors, risk importance and recommended response methods, selects a risk manager after reviewing and deciding the risk management strategy, risk management plan, review cycle and method and expected completion date based on this, and approves "Risk Management Plan ('The Last Chance' -RK-F01)".</p>
Completion criterion	The project manager approved the Risk Management Plan.

5. Establishment and Review of Risk Mitigation Plan

Table 5. Risk Mitigation Plan

Summary	Process that develops options and decides measures to reduce risk factors on a project goal and expand opportunity factors																																				
Initiation Standard	The project manager approved the Risk Management Plan.																																				
Work Content	<div>Decides a level of risk management activities</div> <div>The risk manager decides a level of risk management activities according to a risk level of "Risk Management Plan ('The Last Chance' -RK-F01)".</div> <div>The judgment criteria on a level of risk management activities are as follows.</div> <table><tr><th>Risk Level</th><th>Watch</th><th>Control</th><th>Mitigation Plan</th><th>Response Plan</th><th>Examination</th></tr><tr><td>Lowermost</td><td>◎</td><td></td><td></td><td></td><td></td></tr><tr><td>Lower</td><td>◎</td><td>◎</td><td></td><td></td><td></td></tr><tr><td>Middle</td><td>◎</td><td>◎</td><td>◎</td><td></td><td>◎</td></tr><tr><td>Upper</td><td>◎</td><td>◎</td><td>◎</td><td></td><td>◎</td></tr><tr><td>Uppermost</td><td>◎</td><td>◎</td><td>◎</td><td>◎</td><td>◎</td></tr></table> <div>Establishes a Risk Mitigation Plan</div> <div>The risk responder assesses influence on the aspects of the process,</div>	Risk Level	Watch	Control	Mitigation Plan	Response Plan	Examination	Lowermost	◎					Lower	◎	◎				Middle	◎	◎	◎		◎	Upper	◎	◎	◎		◎	Uppermost	◎	◎	◎	◎	◎
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	<p>budget, quality, manpower and technology according to the risk level, risk management plan and strategy & risk management method, establishes a mitigation plan by identifying risk mitigation activities and a responder and describes it concretely in the "Risk Management Report".</p> <p>3. Establishes a Risk Contingency Plan In case of a very high level of risk, the risk responder establishes a Risk Contingency Plan in addition to activities and necessary resources for coping with emergency situations such as failure of a risk mitigation plan or realization of risk, etc. and describes it concretely in the "Risk Management Report".</p> <p>4. Reviews risk mitigation/contingency plans The project manager reviews risk mitigation/contingency plans such as response activities, review cycle and review method, etc. with " Risk Management Report"</p>
Completion criterion	The project manager approved the Risk Management Report.

6. List of prioritized risks

First, we conduct a risk assessment of the project. And the, the risk needs to be identified.

1) Risk Assessment of Project

Table 6. Risk assessment of project

Summary	The risk capable of having influence on a schedule, costs and resources of the project is distinguished, and a response plan is established after distinguishing the risk with high influence by assessing influence of the distinguished risk.
Initiation Criterion	<ul style="list-style-type: none"> • The scope of the project was defined. • The project schedule was decided.
Work Content	<p>1. Risk Assessment of Project The project manager distinguishes and assesses the risk of the project and establishes a management plan on the project risk.</p> <p>2. The project manager reviews the risk management plan.</p>
Completion Criterion	<ul style="list-style-type: none"> • The risk was distinguished.

2) Identification using Brainstorming methodology with team members

Table 7. Risk identification using Brainstorming methodology

Risk Checklist	Causes
Data inaccuracy	Population data is out of date
Generation of FREE RIDER	Excessive work in the department, Different workplace of team members
Generation of internal discord	Opinion conflicts and intervention of private feeling in case of task performance
Generation of a delay incident of program development	Insufficiency in know-how and related knowledge on fusion of high-level information & communication technology
Riskiness of security	Circulation of hacking and malicious code
Conflicts of many opinions	Generation of various opinions under the situation needing a conclusion

2) Prioritize risks with team members

List of Prioritised Risks in Risk Analysis using Brainstorming methodology with team members

Table 8. Prioritizing risks with team members

Risk Checklist	Risk occurrence	Seriousness	Strategy	Risk Level	Ranking
Data inaccuracy	80%	5	Mitigation	4.0 (Very High)	1
Generation of FREE RIDER	40%	3	Acceptance / Avoidance	1.2 (Low)	6

Generation of internal discord	60%	4	Acceptance / Mitigation	2.4 (Moderate)	4
Generation of a delay incident of program development	60%	4	Mitigation	2.4 (moderate)	4
Riskiness of security	40%	4	Avoidance	1.6 (Low)	5
Conflicts of many opinions	70%	4	Acceptance	2.8 (High)	2

References

Verzuh, E., & American Psychological Association. (2021). A Guide to the Project Management Body of Knowledge: PMBOK Guide.

Schwalbe, K. (2015). *Information technology project management*. Cengage Learning.