Purpose and Objectives of the Identify Risks Process

- The purpose of the Identify Risks process is to identify all the knowable risks to project objectives to the maximum extent possible.
- This is an iterative process, enabling the later identification of initially unknowable and emergent risks.
- This process also records potential responses to risks identified.

Critical Success Factors for the Identify Risks Process

1. **Early Identification:** Since uncertainty is high from the initial stages of a project itself, early risk identification ensures that project decisions take maximum account of risks inherent in the project and make relevant modifications to the project strategy. This improves efficiency as more time is available for developing and implementing risk responses.

2. **Iterative Identification:** Risk identification should be repeated periodically at a frequency determined during the Plan Risk Management process, at key milestones in the project, or if changes are made to the project or its operating environment.

3. **Emergent Identification:** There should be provision to identify risks at any time during the project.

4. **Comprehensive Identification:** The range of sources of risk evaluated should be increased to ensure identification of as many uncertainties as possible.

5. **Explicit Identification of Opportunities:** All opportunities should be considered thoroughly.

6. **Multiple Perspectives:** The perspectives of as many project stakeholders as possible should be represented as this increases the likelihood of exposing more knowable risks.

7. **Risks Linked to Project Objectives:** While identifying risks, their effect on project objectives (time, cost, quality, scope, etc.) should be considered.

8. **Complete Risk Statement:** Identified risks should be described clearly so that the uncertainty, its causes and effects can be understood easily by those responsible for risk assessment and risk response planning.
9. **Ownership and Level of Detail:** The level of detail of risk description should enable a single risk owner to manage the risk with clear responsibility and accountability. It should not be so generalized as to create difficulty in generating risk responses and assigning ownership, nor should it be so detailed as to increase the workload.

10. **Objectivity:** Motivational bias (where someone is trying to bias the result in one direction or another) and cognitive bias (where biases occur as people are using their best judgment and applying heuristics) should be recognized and addressed, and their sources exposed, to minimize subjectivity and to allow honest identification of as many risks as possible.

**Tools and Techniques for the Identify Risks Process**

- Three perspectives/categories of tools and techniques:
  - **Historical Review:** This is based on selection of comparable projects from the past—from the same organization or from other organizations—and identifying risk situations similar to those that might arise in the current project.
  - **Current Assessments:** This is different from historical review in that it relies on detailed examination of the features of the project itself to expose areas of uncertainty, rather than use outside reference points.
  - **Creativity Techniques:** The effectiveness of the use of project stakeholders’ imagination (effected either singly or in groups) to find risks that might affect the project depends on their ability to think creatively.
• The use of these techniques in combination with one another yields better results than their isolated usage. An instance of this is the use of a risk identification checklist (historical review) along with assumptions analysis (current assessment) and brainstorming (creativity).

• To ensure that as many sources of risk are addressed use a risk breakdown structure, a prompt list, or a set of generic list categories.
  o Risk Breakdown Structure: a hierarchical framework of potential sources of risk to a project; may be generic across all projects in organization or project-specific; ensures coverage of all types of risk; tests for blind spots and omissions; offers framework for other risk identification techniques such as brainstorming.

• Clarity of risk description ensures that the project risk process is focused on the actual risks and not distracted by non-risks. Risk meta-language is used to distinguish a risk from its cause(s) and effect(s).

![Diagram showing Cause, Risk, and Effect](image)

**Figure 5.2 Cause, Risk and Effect**

**Documenting the Results of the Identify Risks Process**

The risk register documents all relevant information about identified risks including a properly structured risk description, information on the risk causes and effects, trigger conditions, preliminary responses, and the nominated risk owner for each risk.
Techniques, Examples and Templates for Identify Risks

1. Assumptions and Constraints Analysis:

   This is a simple structured approach that generates project specific risks. It requires a comprehensive list of assumptions and constraints and can be based on lists already documented in the project charter. This technique requires three steps:

   o List assumptions and constraints for the project

   o Ask two questions to test assumptions and constraints:

   ▪ Could the assumption/constraint be false?

   ▪ If it is false would any project objective(s) be affected (positively or negatively)?

   o Where both questions are answered “yes”, generate a risk statement. For example: <Assumption/constraint> may prove false, leading to <effect on objective(s)>.

   The results may be tabulated as given below:

<table>
<thead>
<tr>
<th>Assumption/Constraint</th>
<th>Could this assumption/constraint prove false? (Y/N)</th>
<th>If false, would it affect project? (Y/N)</th>
<th>Convert to a risk?</th>
</tr>
</thead>
</table>

   Figure 5.3 Example of Assumptions and Constraints Analysis

   Disadvantage: This technique has the disadvantage that implicit/hidden assumptions or constraints are often missed.

2. Brainstorming:

   Brainstorming is a common technique used in risk identification. It differs from standard brainstorming in that it is structured, usually using risk categories or risk breakdown structure. Effective application of this technique requires the participation of relevant stakeholders of the project, good facilitation to manage group dynamics, and commitment to non-biased, honest expression of ideas.
Disadvantages: The technique requires attendance of all key stakeholders at a workshop which may be difficult and expensive. Brainstorming is prone to Groupthink and other group dynamics, and may also produce biased results if dominated by a particular person.

3. **Cause and Effect (Ishikawa) Diagram:**

This is a diagrammatic representation of all possible causes which contribute to a given outcome. Each cause can have further sub-causes. The diagram can reveal key relationships among these variables and is a structured approach to determining the root causes of a problem. In applying this technique to risk identification, the outcome should be stated as an effect on a project objective, i.e. the impact of a risk. Risks are identified in this diagram as those uncertain events which could result in occurrence of the impact. The distinction between risks (uncertain causes of the impact) and issues (certain causes of the impact) should be understood.

Disadvantage: The diagram may become too complex when many causes and many problems interrelate.

![Figure 5.4 Example of an Ishikawa or Cause and Effect Diagram for Staff Leaving](image)

4. **Check Lists:**

Checklists record previous experience and allow it to be used for subsequent similar projects. The risk identification checklist may be presented as a set of risks, each of which is considered in turn to determine whether it might be relevant to the project under construction. These checklists should contain both threats and opportunities and should be regularly maintained. It is possible to structure them around a structure such as the risk breakdown structure.
Disadvantages: Checklists can grow to become unwieldy. They often miss opportunities and include only threats.

<table>
<thead>
<tr>
<th>RISK CATEGORY</th>
<th>SUBCATEGORY</th>
<th>EXAMPLE RISKS</th>
<th>Could this risk affect our project?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Technical Risk</td>
<td>1.1 Scope Definition</td>
<td>Scope changes may arise during project</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Redundant scope may be discovered.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Etc.</td>
<td></td>
</tr>
<tr>
<td>1.2 Technical interfaces</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 5.5 Example (Fragment) of a Checklist

5. Delphi Technique:

The Delphi method developed as a group consensus technique to produce forecasts for a particular topic or area of interest (Hiltz and Turoff, 2001).

In risk identification, this is an information gathering technique in which subject matter experts identify risks in their area of expertise. These experts are unknown to each other thus eliminating bias and preventing any undue influence of one expert over another.

An effective facilitator clearly defines the scope of the process and selects the panel of experts with care. The facilitator collects the input from the experts, consolidates it into a list and sends it to each participant for further addition of ideas to those already listed. This process is repeated until no more ideas are generated.

Disadvantage: The process may be time consuming and is dependent on the actual expertise of the experts.

6. Document Review

Documents relevant to the project such as plans, project charter, contract terms and conditions, assumptions, prior project files, technical specifications, legal stipulations etc. should be reviewed thoroughly as these can be indicators of risk in the project.

Disadvantage: Only those risks which are contained in project documentation can be identified through this technique.
7. Failure Modes and Effects Analysis (FMEA)/Fault Tree Analysis:

A Fault Tree Analysis is the analysis of a structured diagram which identifies elements that can cause system failure. This technique is based on deductive logic and can be adapted to risk identification to analyze how risk impacts arise. The effective application of this technique requires a detailed description of the area being discussed.

The undesired outcome is first identified and then all possible conditions/failures which lead to that event are identified. This reveals potentially dangerous elements at each phase of the project.

Disadvantage: Opportunities may be missed in this step as emphasis is laid on threats. The tools required in this technique are generally available only to experts.

![Fault Tree Analysis Diagram]

**Figure 5.6 Fault Tree Analysis of the Possible Causes of a Crash at the Main Road Junction**
8. **Force Field Analysis:**

Typically used in the change management context, the Force Field Analysis technique can be adapted for risk identification by identifying the forces that are for (driving forces) and against (restraining forces) a current situation. This technique allows an in-depth understanding of the factors that influence project objectives.

Disadvantages: This technique is usually applied to only a single objective and so does not provide whole-project view. It is a time consuming and complex technique.

![Figure 5.7 Example of a Force Field Analysis](image)

9. **Industry Knowledge Base:**

   This is another form of a Checklist (refer to point no.4 of ‘Techniques, Examples and Templates for Identify Risks’).

   Disadvantages: This technique captures only that which has happened previously and excludes project-specific risks.

10. **Influence Diagrams:**

   An Influence Diagram is a visual representation of a project situation; it identifies the key areas to address, decision points, uncertainties, and objectives, and how they influence each other. When combined with sensitivity analysis or Monte Carlo simulation, influence diagrams show how risks influence one another. This technique can uncover risks that aren’t readily apparent in verbal descriptions or through other techniques.
Disadvantage: It is not always easy to determine an appropriate structure for this technique.

![Influence Diagram](image)

**Figure 5.8 Example of an Influence Diagram in a Bidding Situation**

11. **Interviews:**

Risk identification interviews require the participation of all key stakeholders and should be conducted by an independent skilled interviewer using a structured agenda in an environment of trust, openness, and confidentiality. Other techniques like Risk Breakdown Structure, checklists or prompt lists can serve as framework for risk interviews.

Disadvantage: It is a time consuming process. It may require filtering as it generates non-risks, concerns, issues, worries etc.

12. **Nominal Group Technique:**

The Nominal Group Technique is another type of brainstorming where the participants are known to one another but their ideas are submitted to the facilitator as written lists, thus allowing anonymity. All the ideas are presented to the participants and more ideas are listed. This process is repeated until no more ideas can be added.

Disadvantage: This technique can cause status concerns or intimidations among the participants, and frustration among members who feel that the process is going slowly.
13. **Post-Project Reviews/Lessons Learned/Historical Information:**

The review of risk databases of previous projects, such as those that arise from post-project reviews or lessons learned exercises or historical information within an organization or industry, can reveal information relevant for a current project. This technique leverages previous experience, and prevents the occurrence of the same mistakes or missing the same opportunities again. Participation of previous project team members and a well-structured project lessons database increases the effectiveness of this technique.

Disadvantages: Only those risks that have occurred previously can be identified. The information available may also be incomplete with no details on ineffective strategies, lack of details of successful resolution etc.

14. **Prompt Lists:**

A prompt list provides a set of risk categories and sources of risk from within the organization and in the external organizational environment. The purpose of this list is to prompt initial thought and stimulate risk identification using other techniques. For instance, prompt lists can be used as a framework for other risk identification techniques like brainstorming or interviews.

This list is not exhaustive but acts as a focus of attention in the identification of risks.

Instances of prompt lists that have become standardized are:

1. **The PESTLE prompt list:**
   - Political risks
   - Economic risks
   - Social risks
   - Technological risks
   - Legal risks
   - Environmental risks

2. **The SPECTRUM prompt list:**
   - Socio-cultural
   - Political
   - Economic
   - Competitive
   - Technological
   - Regulatory/legal
   - Uncertainty/risk
   - Market
Disadvantage: Topics in the prompt list might become too high level.

15. **Questionnaire:**

A risk identification questionnaire helps to identify project and technical risks by setting out a list of questions, about the proposed risk categories and guidelines on assessing the severity of the risks, similar to those used in the Interview technique. This questionnaire should be answered by key stakeholders who have been briefed in detail about the process. The questions should be clear and unambiguous.

Disadvantages: The success of this technique is dependent on the quality of the questions. Similarly, the scope of this technique is limited by the topics covered by the questions. If not framed properly the questionnaire might become a simple reformatting of a checklist.

16. **Risk Breakdown Structure:**

A *Risk Breakdown Structure (RBS)* is a hierarchical framework of potential sources of risk to a project. It may be project-specific or generic across all projects in an organization. The RBS ensures coverage of all types of risk, tests for blind spots and omissions and offers a framework for other risk identification techniques such as brainstorming. A Risk Breakdown Structure is most effectively applied if it is comprehensive and tailored to the needs of the project at hand.
17. Root-Cause Analysis:

A root-cause analysis identifies basic causes of risks that may point to fundamental forces; it also identifies common sources of risks. Risks that may be related because of their common root causes may also be identified. Preventive action may be taken according to the details that are arrived at through this technique.

The success of this technique depends on the willingness by management to accept and address the root cause rather than adopting partial workarounds. The root-cause analysis technique reduces the instances of problems occurring instead of reacting to problems when they occur.

Disadvantages: Root causes cannot be identified in risk management techniques that are organized by individual risk. Other potential causes of risk may be overlooked in this technique. Moreover, there may be no valid strategy to address the root cause once it has been identified.
18. SWOT Analysis:

The Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis considers risk from both the internal and external environment. The SWOT analysis focuses the risk identification assessment on the strengths and weaknesses (internal) of the project as well as on the opportunities and threats (external) that the project may be susceptible to.

Good facilitation is required for the successful application of this technique. There should be no confusion between the four SWOT perspectives (i.e. between Strengths and Opportunities, or between Weaknesses and Threats).

Disadvantage: The technique tends to produce high-level generic risks that are not project-specific.
19. System Dynamics:

System Dynamics (SD) is a particular application of Influence Diagrams and identifies risks within a project situation through the representation of information flows and other entities. An analysis of the SD model exposes unexpected inter-relations between project elements (feedback and forward loops) which lead to uncertainty. The technique can also show the impact of risk events on overall project results. Successful application of this technique depends upon the quality of the model, accuracy of input data collected for the project, understanding of feedback, and competence in applying the tools and understanding their output.

Disadvantages: The building of the SD model requires specialized expertise and software. The technique focuses on impacts but it is difficult to include the concept of probability.
20. WBS Review:

The work breakdown structure (WBS) for a project can serve as a framework for other risk identification techniques such as brainstorming, risk interviews, checklists or prompt lists. A review of the WBS ensures that all elements of the project scope are considered.

Successful application of this technique requires a good work breakdown structure.

Disadvantage: This technique does not consider external risks or those risks that are not specifically related to WBS elements.

Terms and Concepts

1. **Bias**: A preference or an inclination exhibited by the source of information, which inhibits impartial judgment during information gathering about risk. Types of bias which commonly affect the risk process include cognitive and motivational bias.

2. **Brainstorming**: A common technique used in risk identification; it differs from standard brainstorming in that it is structured, usually using risk categories or risk breakdown structure. Effective application of this technique requires the participation of relevant stakeholders of the project, good facilitation to manage group dynamics, and commitment to non-biased, honest expression of ideas.
3. **Document Review**: The identification of risks through careful review of project documentation like the project charter, statement of work, contract terms and conditions, subcontracts, technical specifications, regulatory requirements, legal stipulations etc.

4. **Emergent Risk**: A risk which arises later in a project and which could not have been identified earlier on.

5. **Identify Risks**: The process of determining which risks may affect the project and documenting their characteristics.

6. **Influence Diagram**: Diagrammatic representation of a project situation, showing the main entities, decision points, uncertainties, and outcomes, and indicating the relationships between them.

7. **Prompt List**: A set of risk categories which can be used to stimulate risk identification; ensures coverage of all types of risk; may be used as framework for other techniques; but topics may be too high level.

8. **Risk Exposure**: A measure of overall project risk describing the overall effect of identified risks on objectives.

9. **Risk Meta-language**: A structured description of a risk which separates cause, effect, and risk. A typical description using risk meta-language might be in the form: "Because of <cause>, <risk> might occur, which would lead to <effect>.

10. **Risk Owner**: The person responsible for ensuring that an appropriate response strategy is selected and implemented and for determining suitable risk actions to implement the chosen strategy, with each risk action assigned to a single risk action owner.

11. **Risk Register**: The document containing the results of the qualitative risk analysis, quantitative risk analysis, and risk response planning. It details all identified risks, with description, category, cause, probability of occurring, impact(s) on objectives, proposed responses, owners, and current status.