

Problem solving in Information Management System

Lecture 01



Problem solving

1. What is problem solving ?
2. What steps do you take to solve a problem ?
3. Do you think identifying the problem is more important than its solution ?



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Problem solving

- What is problem solving?
 - A process that you go through to find solutions to problems
 - Skills that can be developed over time
 - Used when needing to solve problems in order to achieve a goal



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Problem solving

- **Definition:** Problem-solving is a structured process used to find effective solutions for various challenges or goals. It involves identifying the problem, brainstorming potential solutions, evaluating those solutions, and selecting the best one.



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Problem solving

- ❑ **Key Insight:** The ability to clearly define the problem is often more critical than finding the solution. A poorly defined problem leads to ineffective solutions.
- ❖ Example: In a company experiencing slow network speeds, if the problem is misidentified as a hardware issue when it is actually a software configuration issue, the solution will not work.



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Problem definition

- Defining the problem clearly is the first and most crucial step in solving it.
- Misunderstanding the problem will lead to wasted effort and resources.
 - ✓ Tip: Break down complex problems into smaller parts to ensure clarity.
- ❖ Example: In an Information Management System, a team might think the problem is “data loss,” but defining the problem further reveals that the data loss is due to poor backup schedules rather than hardware failure.



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Problem definition

- Questions to ask:
 - Is this the real problem or just a symptom ?
 - What impact does this problem have on the system ?
 - If the problem has occurred before, what went wrong with the previous solution ?



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Problem definition



<https://www.youtube.com/watch?v=o4dddmOpQ5s>



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Defining the problem



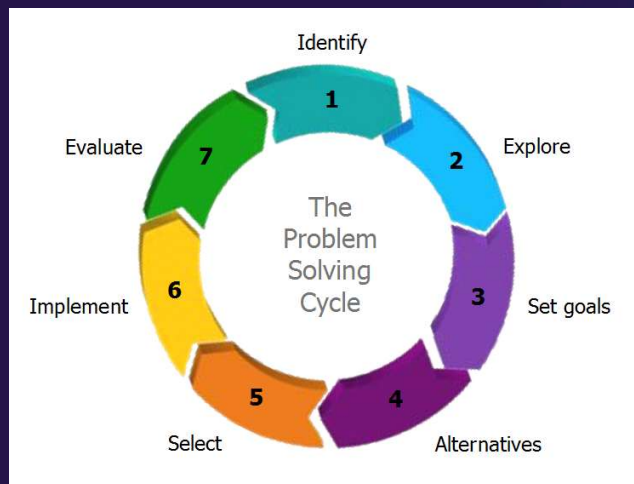
<https://www.youtube.com/watch?v=iwddgAoGBqg>



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Problem solving

- There are many ways to solve problems
- All ways involve a series of steps
- *Seven-Step Problem Solving Model* is one of the most popular methods



Seven-Step Problem Solving Model

- 1. Identify the Problem:** Clearly define the issue at hand.
- 2. Explore the Problem:** Understand the problem fully from different perspectives.
- 3. Set Goals:** Define what you want to achieve by solving the problem.
- 4. Look for Alternatives:** Brainstorm and explore different potential solutions.



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Seven-Step Problem Solving Model

5. **Select the Best Alternative:** Analyze which solution will work best.
 6. **Implement the Solution:** Put your selected solution into action.
 7. **Evaluate the Outcome:** Review the effectiveness of your solution.
- ❖ Example: Applying this model to improve the performance of a cloud-based information system that has slow response times.



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Seven-Step Problem Solving Model

➤ Step 1: Identify the Problem

1. Identify the root cause of the problem rather than just focusing on symptoms.
2. Ask critical questions
 - Why is this happening ?
 - What is the scale of the issue ?
 - Is this the real problem, or merely a symptom of a larger one ?
 - If this is an old problem, what's wrong with the previous solution ?



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Seven-Step Problem Solving Model

➤ Step 1: Identify the Problem

❖ Example: If a system crashes often, don't just assume it's hardware-related. It could be a software issue, outdated patches, or even a human error.

❑ **Key Strategy**: Use the “5 Whys” method: Ask “Why?” five times to dig deeper into the true cause of the problem.



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Seven-Step Problem Solving Model

➤ Step 2: Explore the Problem

○ When you are clear what problems are think about it from different angles, ask further questions:

- How is the problem effecting the business ?
- How are other perceiving the problem as well ?
- What effect will this problem have on other parts of the project ?

⇒ Fully understand all the problems



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Seven-Step Problem Solving Model

➤ Step 2: Explore the Problem

- Exploring all aspects:
 - Break down the problem by understanding its impact from various perspectives: technical, business, and user perspectives.
 - Discuss how the problem affects other areas of the system, project, or team.



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Seven-Step Problem Solving Model

➤ Step 2: Explore the Problem

- ❖ Example: If an information system is slow, it could be due to:
 - Software (inefficient algorithms)
 - Hardware (outdated servers)
 - Network (slow bandwidth)
- Use Visualization Tools such as Fishbone diagram to map out all possible causes.



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Seven-Step Problem Solving Model

➤ Step 3: Set Goals

- Once you have thought about the problem from different perspectives you can identify goals
- What is it that you [your team] want to achieve ?
- List possible goals:
 - Scope, time management, risks, content management systems
 - Others ?



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Seven-Step Problem Solving Model

➤ Step 3: Set Goals

- Goal Setting:
 - Set SMART goals (Specific, Measurable, Achievable, Relevant, Time-Bound) to guide the problem-solving process
 - ❖ Example: Improve server response time by 30% in the next 2 months by optimizing database queries



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Seven-Step Problem Solving Model

➤ Step 3: Set Goals

- Other aspects to consider:
 - Time management
 - Risk management
 - Resource allocation
- ❖ Goal example: Reduce backup failures to less than 1% by implementing a daily backup check system



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Seven-Step Problem Solving Model

➤ Step 4: Look for Alternatives

- Once you have identified goals, look for possible alternatives (solutions)
- The more you find the more you will be able to discover an effective solution
- Brainstorm within the team to come up with a list of possibilities [creative thinking]
- The aim is to collect as many alternative solutions as possible



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Seven-Step Problem Solving Model

➤ Step 4: Look for Alternatives

- Looking for solutions
 - The more alternatives you generate, the higher chance of finding a creative and effective solution
 - Brainstorm without judgement initially and then evaluate later



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Seven-Step Problem Solving Model

➤ Step 4: Look for Alternatives

- ❖ Example: If data is being lost frequently, alternatives might include:
 - Switching to cloud storage
 - Implementing more frequent backups
 - Introducing automated backup checks
- ✓ **Key Tip:** Use a mind map to visualize all possible solutions



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Seven-Step Problem Solving Model

➤ Step 5: Select the Best Alternative

- From list of possible solutions
 - Sort out most relevant in priority [realistic and possible]
 - Predict possible outcomes from the selected solutions
 - Discuss these with team members
 - When you have explored the consequences, use this information to identify the most likely solution



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Seven-Step Problem Solving Model

➤ Step 5: Select the Best Alternative

- Use a decision matrix to weigh the pros and cons of each solution. Consider feasibility, cost, effectiveness and time
- ❖ Example: Compare cost of upgrading hardware vs optimizing software in a decision matrix to choose the best solution to system slowdown
- ✓ **Key Tip:** Consider the consequences of each option before making final decision



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Seven-Step Problem Solving Model

➤ Step 6: Implement a Possible Solution

- Once you have a possible solution you are ready to put it into action
- You can prepare by planning on how to undertake the solution
- Talk to your team members about they think the outcome may be
- What will be the outcome after implementing this solution ?



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Seven-Step Problem Solving Model

➤ Step 6: Implement a Possible Solution

- Plan how the solution will be implemented. This should include a timeline, resources needed and responsible team members
- ❖ Example: If the selected solution is optimizing database queries, the action plan might involve:
 - Testing changes in development environment
 - Deploying updates during low-traffic periods
- **Key Tip:** Ensure you have backup plans in case the solution fails



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Seven-Step Problem Solving Model

➤ Step 7: Evaluate

- Remember that implementing the best possible solution does not mean you have automatically solved the problem
- Questions to ask:
 - How effective was that solution ?
 - Did it achieve what is required ?
 - What consequences would there be as a result ?



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Seven-Step Problem Solving Model

➤ Step 7: Evaluate

- Review the solution's effectiveness by comparing the results against the goals you set earlier
- Measure key metrics such as system response times, error rates to assess the success
- ❖ Example: After optimizing the server, evaluate if the response time has improved by the targeted 30%. If not, revisit earlier steps and make necessary adjustments



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When to Use Problem Solving ?

- Use the problem-solving model whenever you face an issue—whether it's technical, managerial, or related to teamwork.
- It can be used with issues connected to your life
- You can use it by yourself or with friend or others
- With others is very effective as you have access to a wide variety of viewpoints



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Thinking Outside the Box

- You are encouraged to approach problem creatively.
- Sometimes the best solutions come from unconventional thinking.
- ❖ Example: Instead of just upgrading hardware for faster performance, think about optimizing code or using cloud-based solutions



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Thinking Outside the Box



<https://www.youtube.com/watch?v=rRtwh2HvmXQ>



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THANK YOU