

# Root Cause Analysis

Potential problem: the system won't be able to keep up with requirements change in the future  
Using Fishbone diagram to analyze the root cause:

Potential causes could be:

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- |--- Inadequate testing
  - | |--- Lack of automated tests
  - | |--- Insufficient test coverage
  - | |--- Tests not validating all requirements
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- |--- Inadequate documentation
  - | |--- Outdated documentation
  - | |--- Inconsistent documentation
  - | |--- Lack of cross-reference matrix for related requirements
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- |--- Lack of clear communication between team members
  - | |--- Lack of regular meetings

Another potential problem: bugs and errors may occur after deployment of the system

5 WHYS technique:

1. Why might there be unpredicted errors after deployment?  
Because the system can't handle large numbers of users and is only designed for limited use.
2. Why can't the system handle large numbers of users?  
Because some errors only appear when there is a huge load on the system. And the system is unable to address the exact cause of the error in large scales.
3. Why can't the system address the exact cause?  
Because there is no appropriate way to keep track of users and actions that they take. And developers have no clear understanding of system logs.

Suggestion: there must be monitoring logs to keep track of system logs. To help address the exact cause of a system failure.

Potential Problem: Inadequate Performance Under Heavy Load

- Fishbone Diagram:
- Potential Causes:
  - Inefficient Database Queries

- Lack of Horizontal Scaling
- Insufficient Server Resources
- Network Latency Issues
  
- 5 WHYs Technique:
  - Why might there be inefficient database queries?
    - Because the database schema is not optimized for query performance.
  - Why is the database schema not optimized?
    - Because the initial design did not consider the scalability requirements.
  - Why were scalability requirements not considered in the initial design?
    - Because there was insufficient information about potential user growth and usage patterns.
  - Why was there insufficient information about user growth?
    - Because a thorough analysis of potential user scenarios and system usage was not conducted during the initial planning phase.

Potential Problem: Lack of Clarity in User Documentation

- Ishikawa Diagram (Cause-and-Effect or Fishbone Diagram):
  - Potential Causes:
    - Inadequate User Feedback Collection
    - Limited User Testing of Documentation
    - Complexity of Technical Language in Documentation
    - Absence of Interactive Tutorials
  
- 5 WHYs Technique:
  - Why might there be inadequate user feedback collection?
    - Because there is no structured mechanism for users to provide feedback.
  - Why is there no structured mechanism for user feedback?
    - Because the documentation lacks clear instructions on how users can submit feedback.
  - Why does the documentation lack clear instructions?
    - Because user testing of documentation was limited during the development phase.
  - Why was user testing limited?
    - Due to time constraints and a lack of emphasis on the importance of comprehensive user documentation.