Abstracting Errors from Faults

- 1. Understand the nature of the faults found.
- 2. Identify errors by classifying the faults.
- 3. For each error, return to the document and make sure you have found all of the faults for which it is responsible.

1. Understand the nature of the faults found

- To understand the faults, concentrate on:
  - The type of information to which the fault refers (Is it concerned with a particular functionality, a user of the system, a performance requirement, ..?)
- and keep in mind:
  - The fault classification system (Is it an omission? Ambiguity? Incorrect fact? …)

2. Identify errors by classifying the faults

- Classification is an iterative, creative process
- Identify types of information which appear in multiple faults. These are areas of the system which are not well understood.
  - It may be necessary to go back and reclassify at times, or recognize that some faults may impact more than one type of information
  - Remember that not every fault has to be part of a larger pattern! Some are simply isolated faults or typos.

2. Identify errors by classifying the faults (continued)

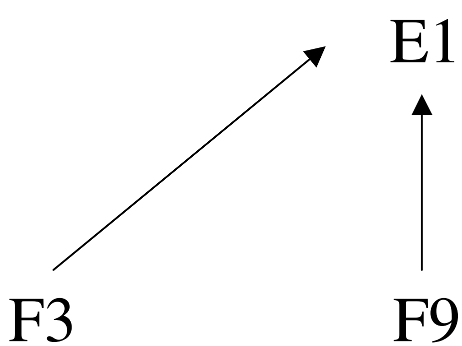
- Get the errors at the right level of abstraction. This may take several iterations of joining and splitting errors.
  - Be general enough that the errors have multiple faults associated which can help you recognize similar faults.
  - Be specific enough that the errors are meaningful and can help you recognize new faults that fit the same category.

2. Identify errors by classifying the faults: example

- Fault 3: An explanation of what information is kept for each customer in the rental transaction record is missing.
  - Type of information involved: The rental transaction process, more specifically, the information which is logged.
- Fault 9: It is never explained what it means to update the rental transaction file when a tape is rented.
  - Type of information involved: The rental transaction process, more specifically, the information which is logged.

2. Identify errors by classifying the faults: example

- Both F3 and F9 deal with the same specific type of information - this probably points to an underlying error:
  - E1: Misunderstanding of the process for logging rentals.



3. Return to the document and make sure you have found all of the faults for which an error is responsible

- Once you have identified classes of faults it may be helpful to see if additional faults exist in those classes.
- When you return to the document, you should know more specifically where to focus your search.

3. Return to the document … example

- Now that we know it is likely that the process for logging rentals has been misunderstood, we can focus on all the areas of the document where error logging is discussed and look for further errors.
- In this way, we could find:
  - F12: When a customer pays a late fine, the fields and values that are to be updated are never specified.