Why is testing necessary?

Software Testing is necessary because

- A defect in software can cause harm to person, environment or company
- A defect can cause loss of money, time or business
- Testing improves software quality
- Testing reduces the risk

Why do we test something?

- We test something to ensure that it is OK
- Testing is necessary because we all are human beings and human beings make mistakes during development.
- Some human errors do not impact much on our day to day life and can be ignored, however some errors are so severe that they can break the whole system or software.
- In such situations you need to take care that such errors are caught well in advance before deploying the system/software in production environment.

Software systems context

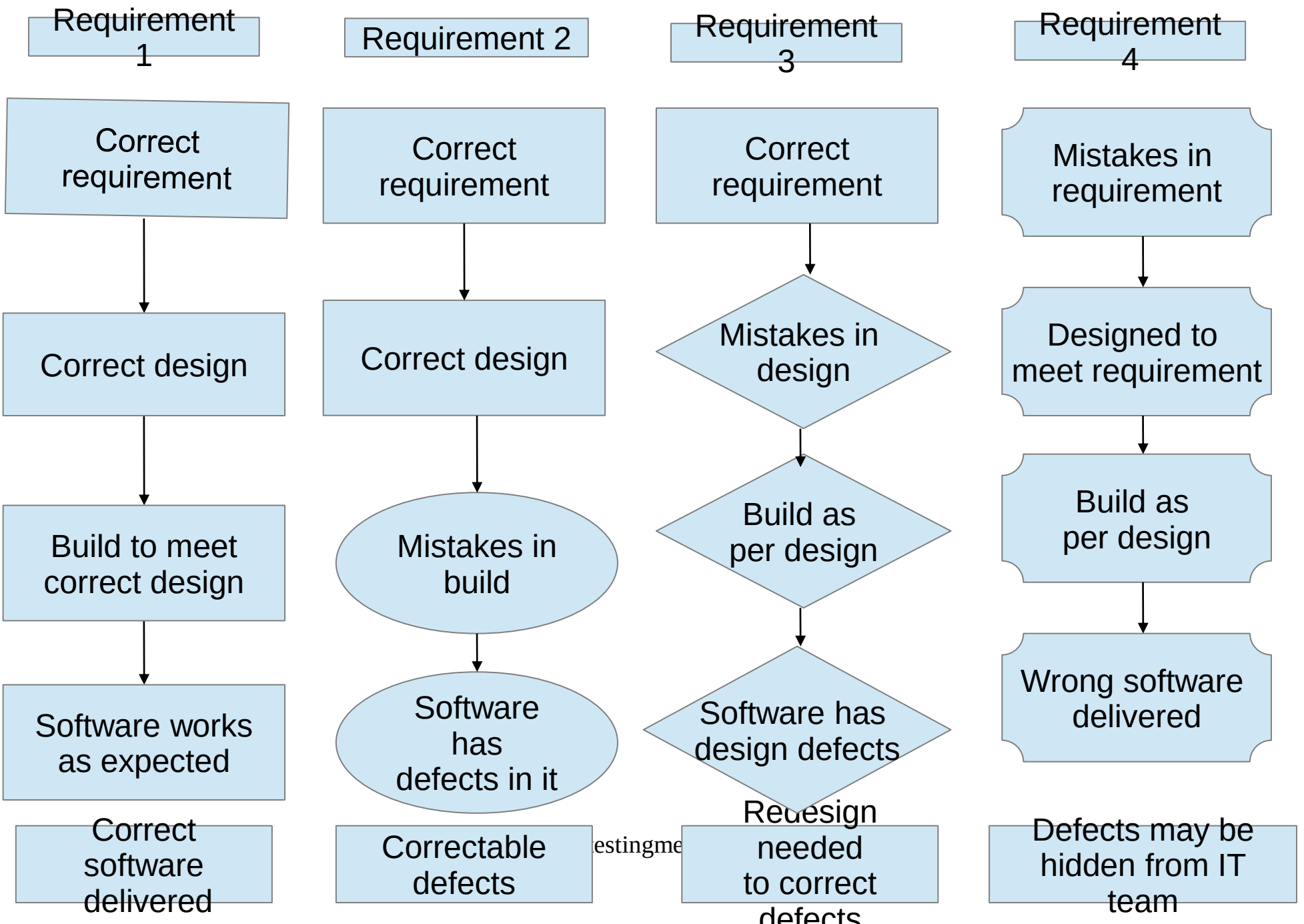
- An error in your personal blog does not impact any one else
- An error in a business website may put off the company as it looks unprofessional
- Net banking websites or ATMs should be thoroughly tested to maintain bank credibility.
- Air traffic control system is very critical system which needs to be thoroughly tested before live deployment as human lives are dependent on it.

Causes of software defects

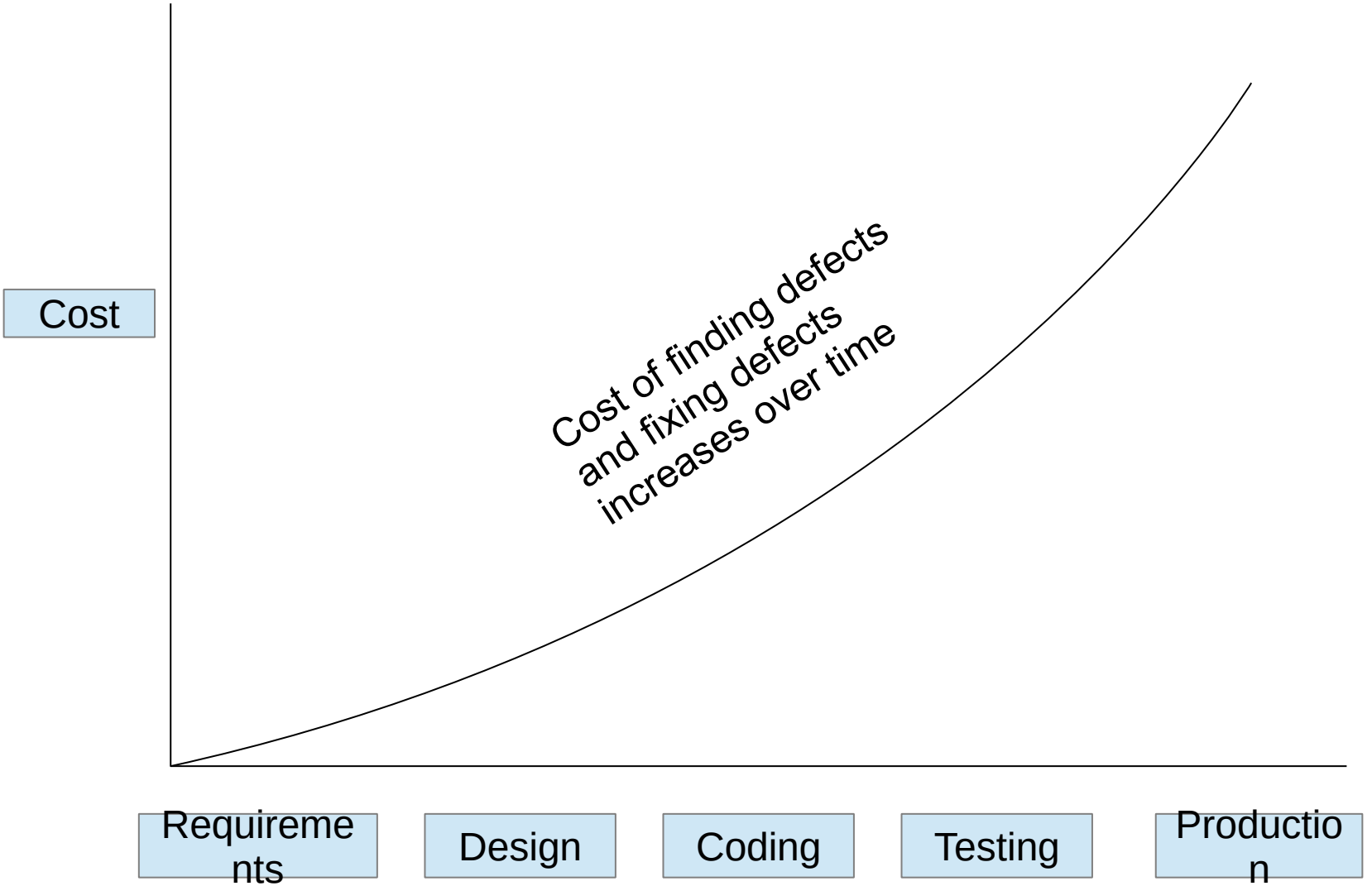
- People may make mistake during requirements gathering
- People may make mistake during design
- People may make mistake during coding

Due to these mistakes their can be flaws in software and these flaws are known as defects or bugs

When do defects arise?



What is cost of defects?



Role of testing in software development, maintenance and operations

- Testing is important in development and maintenance to identify defects/bugs
- Reduces risk of software failures in operational environment
- Improves quality of software
- Testing is also required as part of contractual agreement or legal requirements (For software's which have high risk associated)

Testing and Quality

- Testing helps to measure software quality
- Testing provides confidence in software based on number of defects found
- Well designed tests uncover most of the defects in software and if the tests pass, it gives more confidence in software quality
- Testing helps to find defects and software quality improves when those defects are fixed

What is software quality?

Quality:- The degree to which a component, system or process meets specified requirements and/or user/customers needs and expectations

1. Software quality for developers and testers is that it meets specifications, is technically good and has few defects.
2. Software quality for other stakeholders may be different – They also need value for money

Different viewpoints for software quality can be:

- Attributes of products
- Fit for use
- Good development processes
- Value for money

What is root cause analysis?

1. Root cause analysis is finding the real reason for the failure
2. If the software you are testing fails then you do root cause analysis to find the actual cause of that failure

Ways of carrying out root cause analysis

- Brainstorming all the possible causes
- Grouping them into categories

How much testing is enough?

Testing principle: Exhaustive testing is impossible

Example:

Testing 1 input field with only one input requires

minimum 68 inputs

- Risk assessment is done to decide how much testing to do
- Testing effort is based on the risks associated with different modules of software

Conclusion

- Why is testing necessary
- Causes of software defects
- When do defects arise?
- What is cost of defects?
- Role of testing in software development, maintenance and operations
- Testing and Quality
- What is root cause analysis?
- How much testing is enough?

Thank You!!!