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SE ZG501
Software Quality Assurance and Testing
Lecture No. 8

Software Estimation Techniques

Work Breakdown Structure	Breaks a big task into smaller, manageable parts for easier execution.	If you're developing a website, you break it down into tasks like design, coding, testing, and deployment.
3-Point Estimation	Estimates tasks based on three scenarios: Best case (fastest), Most likely, and Worst case (slowest).	If testing a feature takes 5 days (best case), 7 days (most likely), or 10 days (worst case), the final estimate considers all three.
Wideband Delphi Method	Experts discuss and agree on the best estimate based on collective knowledge.	A team of experienced testers discusses how long a testing phase will take and agrees on a reasonable estimate.
Functional Point Analysis	Measures the eJort required for a task based on its **size, complexity, and cost.**	A simple login page might take 2 days, while a complex payment system could take 10 days due to more functionality.
Agile Estimation	Uses past project data and continuously updates estimates with new information.	A software team estimates testing time based on similar past projects and adjusts if new challenges arise.
Distribution in Percentage	Assigns eJort to diJerent project stages using percentages to balance workload.	If testing takes 40% of the total project time, the team allocates resources accordingly.

Double-Triangular Distribution Explained

The **Double-Triangular Distribution** is a statistical approach used for **effort estimation** in project management and software engineering. It is a modified version of the **PERT (Program Evaluation and Review Technique) formula**, which accounts for different possible estimates:

Formula:

$$E = \frac{a + 4m + b}{6}$$

Where:

- **a** = Optimistic estimate (best-case scenario)
- **m** = Most likely estimate (realistic case)
- **b** = Pessimistic estimate (worst-case scenario)
- **E** = Expected effort (in man-hours or time units)

How It Works:

- It assumes that most tasks follow a **triangular probability distribution** where the **most likely estimate (m)** has the highest weight (4 times more) in the formula.
- The formula helps in calculating a **balanced expected effort** based on **best-case, worst-case, and most likely case**.

Use Case Example:

If a task has:

- Optimistic estimate (a) = 120 hours
- Most likely estimate (m) = 170 hours
- Pessimistic estimate (b) = 200 hours

Then, using the **double-triangular distribution formula**:

$$E = \frac{120 + 4(170) + 200}{6} = \frac{120 + 680 + 200}{6} = \frac{1000}{6} = 166.6 \text{ man-hours}$$

Testing Risks

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Testing risks" refer to potential **issues or challenges that could arise during the testing**

process, a5ecting its accuracy, e5iciency, or e5ectiveness. These risks could include:

1. **Insu5icient Test Coverage** – Missing critical areas in testing.
2. **Defect Leakage** – Bugs **going undetected** and appearing in production.
3. **Limited Resources** – Shortage of testers, tools, or infrastructure.
4. **Tight Deadlines** – Insu@icient time to conduct thorough testing.
5. **Unstable Test Environment** – Issues with testing setups a@ecting reliability.

Poor Test Data – Inaccurate or incomplete data leading to misleading test results

THANK YOU