Work breakdown structure (WBS): how to break down a software project

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A work breakdown structure, or WBS, splits a project into smaller pieces until each piece is small enough to estimate, assign and finish. It is one of the oldest tools in project management, and it works just as well for software as for buildings, as long as you break the work down by outcome rather than by activity.

TL;DR The short version

- A work breakdown structure splits a project into pieces small enough to estimate, assign and finish.
- Break it down by deliverable, not by activity such as 'write code' or 'test'.
- A work package is small enough when it has one owner and a confident estimate; do not forget environments, migration, documentation and security work.

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What a WBS is

A WBS is a hierarchy. The top is the whole project. Each level below divides its parent into parts that together add up to exactly the parent: nothing missing, nothing extra. The lowest level is the work package, a piece of work one person or team can own and finish.

Deliverables, not tasks

The most common mistake is listing activities ("write code", "test", "deploy"). Those repeat under every feature and say nothing about what is being delivered. Break the work down by the things that will exist when it is done: a working login, a billing export, a migrated database. Activities belong inside each work package.

A software example

1. **Project:** customer self-service portal.
2. **1. Accounts:** sign-up, login and password reset, single sign-on.
3. **2. Billing:** invoice list, payment method update, invoice PDF export.
4. **3. Support:** ticket creation, ticket history, email notifications.
5. **4. Platform:** environments, CI/CD pipeline, monitoring and alerts.
6. **5. Launch:** data migration, user documentation, rollout plan.

How small is small enough

- A work package can be estimated with reasonable confidence.
- It has one clear owner.
- Its "done" can be checked by someone else. See definition of done vs acceptance criteria.
- It usually fits within one or two iterations. If it does not, split it again.

WBS and agile backlogs

An agile team does not need a formal WBS chart, but it does the same thinking: epics break into features, features into stories. The rule is the same as in a WBS. Each level should add up to its parent, and the leaves should be small, valuable and testable. A WBS drawn at the start is a hypothesis; expect it to change as you learn.

Mistakes to avoid

- Breaking down by team or department instead of by deliverable.
- Forgetting non-feature work: environments, migration, documentation, security review.
- Going too deep too early on work that is months away.
- Treating the WBS as a schedule. It says what, not when; the schedule comes next. See the critical path method.

> Related credential: Certified Technical Practitioner. Explore the exam facts and syllabus.

Sources and further reading

1. IICTP. TPBOK, Engineering Governance & Agile Delivery. iictp.org/standards/tpbok.

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