

# Challenge the assumptions

## A simple introduction to the challenge process

**Every project runs on assumptions.** Most of them are invisible. They were true once, or someone said them with confidence, and they hardened into the plan. Schedules are often held in place by beliefs nobody has examined lately, not by physics. The challenge process is a structured way to find those beliefs and test them, together, in a room.

The method extends Edward de Bono's "challenge" technique: block the current way of doing things for a moment, not to prove it wrong but to ask whether it is the only way [1]. We have used it for years with engineering teams to pull in schedules and unstick programs. In one program the exercise produced a three-month pull-in, and the product reached the market within weeks of its target date [2].

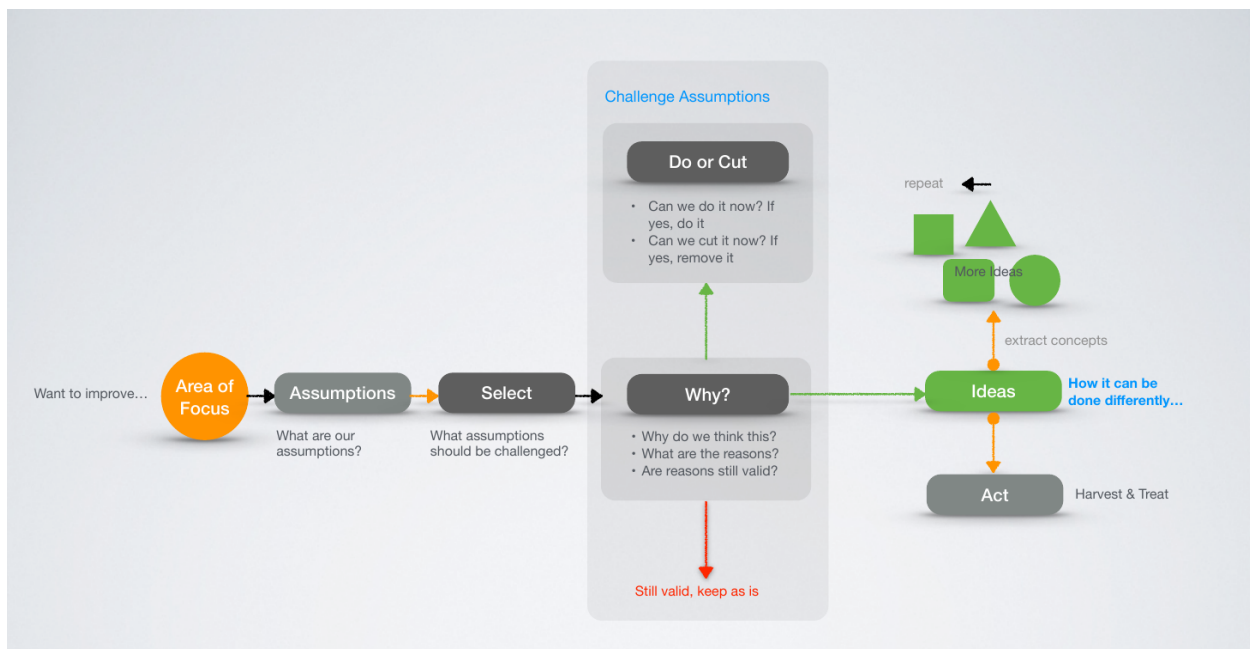


Figure 1. The challenge process, from area of focus to action.

## The steps

Start with an area of focus: the thing you want to improve. A slipping schedule, say, or a cost target that will not close.

Surface the assumptions. Every team member contributes two to four beliefs they hold about the program. A facilitator collects them anonymously and merges them into one list. Anonymity matters. The most useful assumptions are often the ones people hold privately and suspect the rest of the group does not share.

Select. You cannot challenge everything. Rank the list and pick the assumptions with the most leverage. The test for each one: if we relaxed it, would the schedule pull in? An assumption that changes nothing

when relaxed has no leverage. Park it.

Ask why. For each selected assumption: why do we think this? What are the reasons? Are the reasons still valid? Some assumptions survive the questioning. Still valid, keep as is. That is a good outcome; the belief is now a decision instead of a habit.

Do or cut. Some challenges resolve on the spot. Can we do it now? Then do it. Can we cut it now? Then remove it.

Generate ideas. The assumptions that do not survive open the interesting question: how could it be done differently? Does this have to be done this way? Does it have to be done at all? Extract the concepts behind the first ideas, generate more, repeat.

Act. Harvest the ideas and turn them into actions with owners and dates. Without this step the workshop was a pleasant conversation.

## Language is everything

An assumption you cannot phrase crisply is an assumption you cannot challenge. We ask teams to start every statement one of four ways:

|                                         |                                                                    |
|-----------------------------------------|--------------------------------------------------------------------|
| <b>It is essential that...</b>          | "It is essential that the lead customer actively engages."         |
| <b>... dominates our thinking</b>       | "Schedule over quality dominates our thinking."                    |
| <b>We must avoid...</b>                 | "We must avoid running multiple projects at the same time."        |
| <b>We must stay within ... boundary</b> | "We must stay within current resource constraints; we can't hire." |

The four stems force the belief into the open. Essentials can be tested, dominant ideas can be named, avoidances can be questioned, and boundaries can be moved.

## Before the workshop: the workbook

The live session works because of quiet preparation. In the weeks before, the submitted assumptions are merged into a challenge workbook: one row per assumption, with the category, why we believe it, what specific move we would make if we relaxed it, what part of the schedule that move attacks, and a pre-rated leverage level to seed the ranking. Two columns stay blank for the room: workshop dots and disposition.

### Assumptions register — candidates for challenge

*lateralworks - generic template - consolidated team inputs, collected anonymously before the workshop*

| ID | Category                         | Assumption                                                                                                   | Why we believe this                                                          | What changes if we relax it                                                                 | Pull-in mechanism (what it attacks)                     | Leverage | Owner / area     | Workshop dots | Disposition |
|----|----------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|---------------------------------------------------------|----------|------------------|---------------|-------------|
| A1 | It is essential that...          | It is essential that the first release meets the full published specification across all features and modes. | Broad addressability — one product serves every customer.                    | Qualify the subset the lead customer actually needs first, add the rest in a fast follower. | Shrinks the test and validation matrix.                 | High     | Design / product |               |             |
| A2 | It is essential that...          | It is essential that the lead customer actively engages in the program.                                      | Sign-off, feedback and requirement clarity all depend on it.                 | Secure a named engagement owner and a fixed feedback cadence.                               | Enable — removes feedback latency on the critical path. | High     | Commercial       |               |             |
| B1 | ... dominates our thinking       | First time-right technical completeness dominates our thinking, over schedule.                               | Engineering culture; reputational stakes.                                    | Adopt "sufficient for first qualification" inside a defined quality floor.                  | Removes scope and perfection chum.                      | High     | Leadership       |               |             |
| B2 | ... dominates our thinking       | Risk avoidance dominates our thinking.                                                                       | A failed build or iteration genuinely adds time.                             | Accept bounded, recoverable risk where a failure chum would not hit the critical path.      | Compresses the verify-everything build handoff.         | Med-High | Program          |               |             |
| C1 | We must avoid...                 | We must avoid starting any long-lead activity before design freeze.                                          | Rework risk if the design changes after the start.                           | Pre-stage long-lead items at your own risk; buy back calendar time.                         | Compresses the serial design-to-build handoff.          | High     | Program          |               |             |
| C2 | We must avoid...                 | We must avoid developing the test program in parallel with the redesign.                                     | The test program depends on the final design; parallel work could be wasted. | Build the test program concurrently against the stable 90%.                                 | Removes a serial tail after the build arrives.          | Med-High | Test lead        |               |             |
| D1 | We must stay within ... boundary | We must stay within current engineering headcount — we cannot hire or borrow resources.                      | Budget, runway and hiring lead time.                                         | Targeted contract or loaned expertise on the bottleneck skills only.                        | Breaks the owner-concentration bottleneck.              | High     | Leadership       |               |             |
| D2 | We must stay within ... boundary | We must stay within the existing serial design — build - test sequence.                                      | Standard process; it is how we have always run.                              | Authorize concurrent engineering across the boundary; overlap phases.                       | Overlaps phases currently run end-to-end.               | Med-High | Program          |               |             |

Example rows A1–D2 show the expected format — replace with your own. Yellow cells are yours to fill in

Figure 2. The assumptions register: the team's consolidated beliefs, collected anonymously before the workshop.

Some submissions turn out not to be assumptions at all. "The first silicon reveals a fundamental bug" is not a belief about how the program must run; it is an event that might hit it. Those move to a separate risks tab

and get different questions: is this a real risk, and what can we do to reduce the impact or lower the likelihood? Applying the challenge questions to a risk does not work, and mixing the two muddies both conversations.

### Challenge assumptions — team workbook

lateralworks · generic template · pre-work for a challenge workshop

|                                          |                                                                                                                                                                                                                                           |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Purpose</b>                           | Collect the assumptions baked into your program before the workshop, then challenge them live as a team. The test for every assumption: if we relaxed it, would the outcome we want (schedule, cost, scope) improve?                      |
| <b>The flow</b>                          | Area of focus → Assumptions → Select → Why? → Do / Cut, or Challenge → Ideas → Act. Surface assumptions, dot-rank them, interrogate the high-leverage ones, and turn the challenged ones into ideas and actions.                          |
| <b>Four ways to phrase an assumption</b> |                                                                                                                                                                                                                                           |
| It is essential that...                  | It is essential that the lead customer actively engages.                                                                                                                                                                                  |
| ... dominates our thinking               | Schedule > quality dominates our thinking.                                                                                                                                                                                                |
| We must avoid...                         | We must avoid multiple projects at the same time.                                                                                                                                                                                         |
| We must stay within ... boundary         | We must stay within current resource constraints — we can't hire.                                                                                                                                                                         |
| <b>The leverage test</b>                 |                                                                                                                                                                                                                                           |
| GOOD — has leverage                      | Assumption: "We must have xyz performance at first release." → If relaxed, a whole test matrix drops out and the schedule pulls in.                                                                                                       |
| BAD — no leverage                        | Assumption: "Company X is the first customer." → Relaxing it changes nothing you can act on. Park it.                                                                                                                                     |
| <b>How to read the register</b>          |                                                                                                                                                                                                                                           |
| Category                                 | One of the four phrasings above.                                                                                                                                                                                                          |
| Why we believe this                      | The reasons behind the assumption. Ask: are the reasons still valid?                                                                                                                                                                      |
| What changes if relaxed                  | The specific move you would make if you stopped believing the assumption.                                                                                                                                                                 |
| Leverage                                 | Pre-rating to seed the ranking: High / Med-High / Med / Low.                                                                                                                                                                              |
| Workshop dots                            | Leave blank — for sticky-dot ranking in the room. Most dots get challenged first.                                                                                                                                                         |
| Disposition                              | Leave blank — filled live in the workshop: Challenge / Keep / Do / Cut.                                                                                                                                                                   |
| <b>The Risks register tab</b>            | Some inputs are events that could hit the program rather than beliefs about how it must run. Keep those on the Risks tab and treat them separately: is this a real risk, and what can we do to reduce the impact or lower the likelihood? |
| <b>Cells to fill in</b>                  | Cells with the light-yellow fill are yours to complete. Example rows show the expected format — replace them with your own program's assumptions.                                                                                         |

lateralworks · template — adapt freely for your own challenge workshop

Figure 3. The workbook's instructions sheet: the flow, the four stems, and the leverage test.

## In the room

The lists go on the wall. The team dot-ranks them and works the entries with the most dots through the why questions. Each assumption leaves the room with a disposition: challenge, keep, do, or cut. There are no wrong entries; the point of the exercise is to surface disagreement. An assumption half the room holds as obvious and the other half has never heard of is exactly where the schedule is hiding.

Appendices A and B show the full registers from one program, anonymized. A generic version of the challenge workbook is available for download with this article. Adapt the example rows to your own program and use it to collect your team's assumptions before the workshop.

## References

- [1] de Bono, E. *Serious Creativity: Using the Power of Lateral Thinking to Create New Ideas*. HarperBusiness, 1992.
- [2] lateralworks. "Breakthroughs by Challenging Assumptions." lateralworks.com, January 2019.  
<https://lateralworks.com/ideas/2019/1/16/breakthroughs-by-challenging-assumptions>

## Appendix A

# A real assumptions register, anonymized

This register comes from a semiconductor qualification program, anonymized. Twenty-four assumptions were collected from the team over three weeks and consolidated for a one-day workshop. Two were already addressed before the room met (marked \*).

| ID                                      | Assumption                                                                                                                                                    | What changes if we relax it                                                                                                      | Leverage |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>It is essential that...</b>          |                                                                                                                                                               |                                                                                                                                  |          |
| A1*                                     | The first product meets the full industry-standard specification across all features and modes.                                                               | Already decided: qualification targets the feature subset the lead customer actually exercises.                                  | Low      |
| A2                                      | The full 0-85°C operating temperature range is required at first pass.                                                                                        | Qualify the temperature band the lead customer actually deploys first; add further grades after launch.                          | Med-high |
| A3                                      | The full reliability demonstration (1000h HTOL and the generic retention/endurance headline) is required before the lead customer can complete qualification. | Start customer application qual on the 168h HTOL data; set retention targets to the customer's real requirement.                 | High     |
| A4                                      | Respin 1 is a full-mask respin that corrects every known issue.                                                                                               | Scope Respin 1 to qual-blocking fixes only (targeted / partial mask); defer nice-to-have items under change control.             | High     |
| A5                                      | The lead customer actively engages in the program.                                                                                                            | Secure a named engagement owner and a fixed cadence; use it to right-size requirements and speed sign-off.                       | High     |
| A6                                      | Two respins are required to reach qualification.                                                                                                              | Land every qual-blocking fix in Respin 1 and productize on it; skip Respin 2.                                                    | High     |
| A7                                      | The first product supports both planned configurations.                                                                                                       | Qualify the lead configuration first; add the second variant afterwards if the roadmap can be staged.                            | Low      |
| A8                                      | Process learnings count only from wafers run on a process similar or identical to the production foundry's.                                                   | Learning vehicles on other lines become usable evidence; learning cycles run in parallel with the mainline.                      | Med      |
| <b>... dominates our thinking</b>       |                                                                                                                                                               |                                                                                                                                  |          |
| B1                                      | First-time-right technical completeness dominates our thinking, over schedule.                                                                                | Adopt "sufficient for customer qual" inside a defined quality floor; remove scope and perfection churn.                          | High     |
| B2                                      | First-pass yield optimization dominates our thinking.                                                                                                         | Accept low engineering-sample yield to get characterization parts and learning sooner; ramp yield after qual.                    | High     |
| B3*                                     | CapEx and spend minimization dominate our thinking.                                                                                                           | Already relaxed in practice: spend wherever it buys calendar weeks.                                                              | Low      |
| B4                                      | Risk avoidance dominates our thinking.                                                                                                                        | Accept bounded, characterizable risk where a failure would not cost a respin cycle.                                              | Med-high |
| B5                                      | The foundry's quoted standard cycle time dominates our planning.                                                                                              | Treat quoted durations as negotiable; priority and hot-lot handling on the critical-path lots.                                   | High     |
| B6                                      | Day-to-day schedule administration dominates our project-management thinking.                                                                                 | Rebalance PM effort toward the big picture: critical-path work, pull-in moves and de-risking that daily tracking never surfaces. | Med      |
| <b>We must avoid...</b>                 |                                                                                                                                                               |                                                                                                                                  |          |
| C1                                      | We must avoid starting any long-lead fab activity before design freeze.                                                                                       | Pre-stage long-lead items (mask blanks, tooling, shuttle bookings) at our own risk; buy back calendar time.                      | High     |
| C2                                      | We must avoid developing the test and qualification program in parallel with the respin.                                                                      | Build the test program concurrently against the stable 90%; remove a serial tail after silicon arrives.                          | Med-high |
| C3                                      | We must avoid taping out with any open design item.                                                                                                           | Two directions to debate: tape out at a defined confidence threshold for earlier silicon, or hold for a better-scoped respin.    | Med      |
| C4                                      | We must avoid starting the respin redesign before test data has validated the first silicon.                                                                  | Start the redesign now on defects already known; parallelize redesign with wafer test.                                           | High     |
| C5                                      | We must avoid running multiple programs at the same time.                                                                                                     | Contrast case: relaxing this would hurt the program, not help it. Focus is the point; keep it.                                   | Low      |
| C6                                      | We must avoid placing purchase orders before the design and drawing checks are fully complete.                                                                | Start the purchase order at unit-design approval; pre-reserve substrates and long-lead materials.                                | Med-high |
| <b>We must stay within ... boundary</b> |                                                                                                                                                               |                                                                                                                                  |          |
| D1                                      | We must stay within current engineering headcount; we cannot hire or borrow resources.                                                                        | Think outside the box on resourcing: targeted contract or loaned expertise on the bottleneck skills only.                        | High     |
| D2                                      | We must stay within the existing serial design-then-build-then-test sequence.                                                                                 | Authorize concurrent engineering across the boundary; overlap phases currently run end-to-end.                                   | Med-high |
| D3                                      | We must stay within the current foundry as the sole source for qualification.                                                                                 | Contrast case: dual-sourcing matters strategically but is a long-term move, not a lever for the current schedule.                | Low      |
| D4                                      | We must stay within the planned learning lots and the current process-learning plan.                                                                          | Insert another learning round on the next respin; raise confidence in the process stack before qualification commits.            | Med-high |

\* Kept without challenge: already addressed before the workshop.

## Appendix B

# The risks register, anonymized

Risks are not assumptions. The challenge questions — does this have to be done this way? does it have to be done at all? if it does, how could it be done differently? — work on assumptions and fail on risks. A risk is an event that could hit the program, not a belief we can relax. The questions for a risk are different: is this a real risk, and what can be done to reduce the impact or lower the likelihood? Eight of the team's submissions arrived phrased as assumptions but were carried as risks, on the register below. Reducing the odds of a future slip is as valid a workshop outcome as pulling the schedule in.

| ID | Risk                                                                                                                        | Why it is credible / trigger                                                                                                            | Impact if it hits                                                                        | Related        | Risk-reduction ideas                                                                                                                           |
|----|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| R1 | First silicon reveals a fundamental design or integration bug that forces a major redesign, not just a respin.              | First full product design on this process, with only partial feedback from a testchip; known performance gaps are not yet fully listed. | A major redesign loop instead of a respin; roughly half a year to a full year added.     | A4, A6, B4     | List the known performance gaps explicitly before the workshop; test the first silicon hard and early; pre-plan a targeted-fix fallback.       |
| R2 | The planned process experiments do not resolve the key device issues; no option performs sufficiently.                      | Device targets are still far from reach, and only two learning lots are planned to find the best-known method.                          | Process stack not qualification-ready; qualification start slips by quarters.            | D4, A8         | Add learning rounds and lots; negotiate a leapfrogging flow with the foundry; widen the set of usable learning vehicles.                       |
| R3 | The scheduled proof of concept does not convince the foundry to keep supporting the technology as a viable long-term path.  | The foundry's continued engagement is conditional on demonstrated progress.                                                             | Loss of foundry priority or support; threatens the whole qualification path.             | B5, D3         | Agree with the foundry in advance what the proof of concept must demonstrate; manage it as a program milestone with its own critical path.     |
| R4 | The lead customer does not accept the new minimum viable product.                                                           | The MVP (reduced feature set, temperature band and reliability targets) has not yet been presented for explicit buy-off.                | Rework and requalification against different requirements; the scope reductions unravel. | A1, A2, A3, A5 | Present the MVP to the customer now and obtain written acceptance; install the named engagement owner and cadence.                             |
| R5 | Running new-technology introduction and new-product introduction at the same time compounds risk.                           | Technology learning and product qualification share the same silicon, people and calendar.                                              | A single failure hits both learning loops at once; slips multiply rather than add.       | B4, C5, D4     | Decouple learning vehicles from qualification vehicles where possible; make the coupling explicit in the schedule.                             |
| R6 | The cost of test per die ends up far too high and makes the product financially unattractive.                               | Test time and coverage for the new product are not yet bounded; no cost-of-test target exists.                                          | Product economics fail even if qualification succeeds.                                   | B2, A7         | Set a cost-of-test target now and design the test flow to it; revisit coverage against the customer-exercised subset.                          |
| R7 | Engineering execution capacity is too thin: much of the organization plans and documents while few hands do technical work. | Current headcount and role mix; an onboarding bottleneck once hiring finally starts.                                                    | Broad slip risk across every critical path.                                              | D1, B6         | Shift effort from planning and documentation to execution; bring in contract or loaned engineers now; start onboarding ahead of the peak need. |
| R8 | Unclear ownership in many areas lets tasks and decisions stall.                                                             | Ownership has not been made explicit across all program areas.                                                                          | Latency and dropped hand-offs, on and off the critical path.                             | B6, D1         | Name a single owner per area before the workshop and make ownership visible in the program plan.                                               |

*Kept separate from the assumptions register: these are events that could hit the program, not beliefs we can relax. All submissions are treated anonymously.*