02 / COLLABORATION

Toyota & Aisin

When the network must act

Can partners rebuild capacity before the inventory runs out?



Toyota Motomachi plant, 2019. Photograph: Evelyn-rose.
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An operational crisis about shared knowledge, reciprocal commitments and the limits of trust.

Toyota purchasing and Aisin operations leadership | February 1997

35-45 minutes to prepare / 75 minutes to discuss
Original public-source teaching case • First member edition • 1 November 2026

PRINCIPLED BUSINESS IN PRACTICE

Introduction

About Principled Business

Principled Business (PB) is a nonprofit organization that brings together business leaders to advance capitalism through education, relationships and action. It helps founders, executives and investors understand free enterprise, apply its principles in their organizations, and explain the contribution business makes to people's lives.

The PB manifesto grounds capitalism in individual agency, private ownership and voluntary production and trade. These commitments take practical form in everyday business decisions.

Collaboration

The manifesto treats voluntary collaboration and mutually beneficial exchange as central to capitalism. The Toyota-Aisin case asks how collaboration works when a critical supplier loses capacity. Partners must decide whether to share equipment, expertise and time, while leaders establish responsibilities, compensation and quality requirements. Your task is to turn a willingness to help into usable output under a deadline. The choices expose both the strength of relationships and the practical limits of relying on them.

PB presents this case to explore the business arrangements that make voluntary cooperation effective. A convincing plan explains what each participant can contribute, why participation serves its interests, and how the group will know that the promised work has been delivered safely.

What you will learn

01 Identify the capabilities and reciprocal commitments needed for effective collaboration.

02 Compare recovery plans using timing, usable capacity, cost and sensitivity analysis.

03 Allocate decision authority, technical acceptance and partner compensation in a workable recovery plan.

> **Apply it to your own business**
> Choose a dependency your business could not replace quickly. What agreement, shared knowledge or technical preparation would make a partner's help usable during a disruption?

Source: About Principled Business; Capitalists for Capitalism Manifesto, Section 2: Collaboration.

NOTES FOR STUDENTS AND TEACHERS

Using this case study

This packet contains the case, exhibits, worksheet, sources, answers and teaching notes. Allow 35-45 minutes to prepare and 75 minutes for discussion. Have a calculator or spreadsheet available.

Pages	What to use and when
4-8	Decision, evidence, exercise and alternatives. Read before discussion.
9	Decision worksheet. Complete before reading the answers.
10	Sources and reading notes. Check the evidence and its limits.
11-12	Worked answers, outcome and teaching plan. Students: read after deciding.

For students

Read the case once to identify the decision, then work through the exhibits. Separate reported historical facts from the explicitly invented exercise. Use the information available at the case date; record assumptions when the evidence is incomplete. Complete the calculation and the worksheet on page 9. Be ready to defend your choice and name the evidence that could change it.

For individual study, write your recommendation before turning to pages 11-12. Compare your reasoning with the worked analysis, then add a short reflection on what you would retain or change. Choose one action to try in your own business.

For teachers and discussion leaders

Read the full packet and the timed plan on page 12 before teaching. You can assign pages 1-10 initially, revealing the final two pages after students commit to a recommendation. Begin with a choice or vote; record the alternatives and supporting evidence on the board.

Ask students to distinguish offers of help from accepted production capacity. Require an answer on supplier incentives, technical authority and who can reject unsafe or unsuitable output.

> **How to assess the work**
> Look for a clear recommendation, accurate analysis with stated assumptions, attention to affected people, a fair treatment of the strongest objection, and an implementation plan with an owner and review point. Assess the reasoning rather than agreement with the historical decision.

SATURDAY 1 FEBRUARY 1997

The decision

A fire at Aisin's Kariya plant on 1 February 1997 created an immediate problem for Toyota and its suppliers. [T1] For this case, take the role of the joint Toyota purchasing and Aisin operations leadership after the initial damage assessment. You must decide how to restore a safety-critical component supply before a factory problem becomes a network-wide production stoppage.

Later field research describes destroyed machining equipment, surviving casting supply and assembly capability, and only two or three days of inventory. Aisin had supplied about 89.8% of Toyota's Japanese proportioning-valve purchases in 1996. These are retrospective reconstructions of the starting conditions, not a surviving management briefing from that morning. [T2]

The immediate temptation is to describe the task as finding another supplier. That understates the problem. Spare equipment is useful only if it can make an acceptable part, in the right variant, soon enough. Engineering information has to reach the people who can use it. Their work must then pass inspection and enter a production schedule that may already be changing.

Waiting for a fully restored specialist operation may preserve a familiar process while sacrificing output in the meantime. Distributing work may create useful capacity sooner while adding coordination and quality risks. The team needs an executable recovery plan, not a statement that collaboration is desirable.

What you must authorize

Decide which work stays with Aisin, which work can be shared, who receives technical information, who certifies acceptable output and how partners will be compensated. The alternatives in this case are PB's analytical framing; they do not reproduce a recorded meeting or attribute invented statements to executives.

> **The decision deadline**
> Design the first 48 hours of the response. Which commitments must be made now, and which can wait until better information arrives?

Read through page 8 and complete your recovery plan on page 9. Worked analysis and the historical recovery are included on pages 11-12; read them after committing to a plan.

THE MANAGEMENT PROBLEM

Cooperation needs an operating system

A firm can agree to help and still be unable to deliver. One partner may have machines but no appropriate gauges. Another may understand the process but lack capacity. A third may have capacity only by postponing work for a different customer. The response depends on matching tasks with capabilities and making those dependencies visible.

The coordination bargain

Consider the position of a supplier asked to lend people and equipment. What does it receive in return: reimbursement, preservation of a customer relationship, future opportunity or reciprocal help? These are candidate motivations to examine, not assumed motives for any particular company. Without a credible answer, the request risks becoming an exercise of bargaining power rather than voluntary cooperation.

The original research on the Aisin fire emphasizes shared capabilities and relationships across the supplier network, not only bilateral links with Toyota. [T3] That suggests a question for the crisis team: can capable partners organize useful work locally while a common authority preserves compatibility and safety?

Where decision rights belong

A recovery plan should distinguish freedom to solve a manufacturing problem from authority to release a part into service. Local teams can experiment with a process while a defined engineering and quality function controls specification changes and acceptance. Delegation becomes more useful when people know which decisions they own and which require approval.

Paying for speed without defining acceptance can produce unusable inventory. Insisting on a fully negotiated contract before any preparation can waste the limited buffer. A short emergency agreement might authorize documented costs up to a ceiling, establish quality responsibility, protect technical information and set a later reconciliation date. This is a proposed management approach, not a description of an actual Aisin contract.

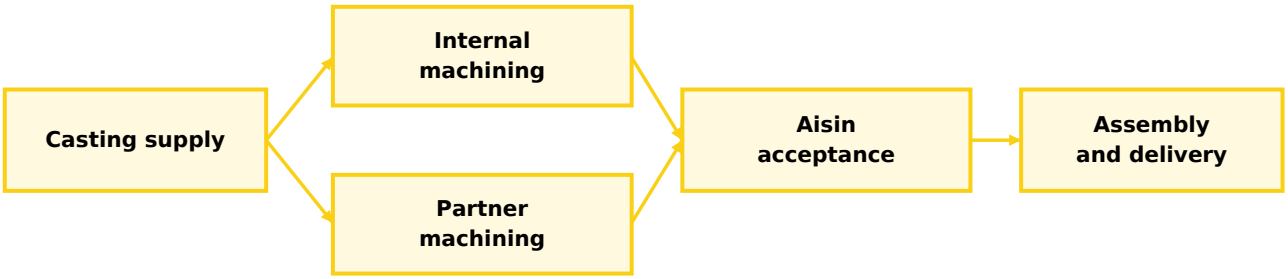
> **The skeptical question**
> Would this network still cooperate if Toyota’s expected future business disappeared? Your answer changes how you interpret trust, dependence and commercial self-interest.

EXHIBIT 1 • HISTORICAL CONDITIONS AND ANALYSIS

Map the bottleneck

Observed condition	Decision implication
Most Japanese Toyota P-valve purchases came from Aisin. [T2]	A disruption at one specialist could affect many downstream operations.
Specialized machining equipment was lost. [T2]	Replacing an entire plant and temporarily replacing a process are different projects.
Casting supply and assembly capability survived. [T2]	Investigate whether the damaged operation can be separated from the rest of the work.
Stock cover was measured in days. [T2]	The useful response time is shorter than a normal sourcing cycle.

Right-hand column: PB analysis. These implications are questions for the decision maker, not additional historical findings.



Analytical process map, not an engineering drawing. A temporary partner’s output must pass the same acceptance boundary as internal output; parallel activity is not permission to waive safety requirements.

Information to request immediately

01 Inventory by usable part variant and consuming plant, not just aggregate stock.

02 Available machining, measurement and transport capacity, with the earliest verified start time.

03 Drawings, tolerances, tooling needs, inspection methods and a controlled revision record.

04 A single queue of shortages and priorities that both internal teams and partners can see.

EXHIBIT 2 • INVENTED CAPACITY EXERCISE

Compare two recovery plans

This simplified exercise is not Toyota or Aisin operating data. Assume demand of 1,000 component kits each day for ten days, opening inventory of 2,000 kits, and one kit per finished unit. Daily output is available before that day's demand. Unfilled units are lost in this model, not backlogged.

Days	Plan A output per day	Plan B output per day
1-2	0	0
3-4	0	300
5-6	500	700
7-10	1,000	1,000

Plan A: concentrated recovery; direct recovery cost $2.0 million.
Plan B: parallel recovery; direct recovery cost $2.6 million.
Assume $1,000 contribution lost per unfilled finished unit. Ignore taxes, fixed costs, later catch-up production and additional quality costs.

Work the inventory balance

Opening stock + usable output − demand served = closing stock. Demand served cannot exceed the kits available. Calculate the total unfilled units for each plan, then add direct recovery costs to the contribution lost.

Question	Your result
Plan A: total unfilled units	
Plan B: total unfilled units	
Contribution per avoided lost unit needed to justify B	
Best plan if every B output figure is 10% lower	

> **Test the conclusion**
> The faster plan may be more expensive, less reliable or less safe. Quantify the first two; treat safety as an acceptance requirement rather than a price to trade away.

ALTERNATIVES AND GOVERNANCE

Authorize a response

Approach	Main strength	Main exposure
Concentrate recovery	Fewer interfaces and established responsibilities.	An extended specialist bottleneck.
Use a small partner group	More capacity with limited coordination complexity.	A narrow search may miss useful capabilities.
Mobilize a broader network	Parallel problem solving across more capabilities.	Version control, verification and logistics can become bottlenecks.

A hybrid is a legitimate recommendation, but it must specify the division of work. “Do everything” is not a recovery plan when engineers, inspection equipment and management attention are scarce.

Five decisions your plan must resolve

01 Who allocates scarce parts among plants and customers? Choose a rule that can survive disagreement.

02 Who can authorize emergency spending, and what records will make later reimbursement credible?

03 Who owns the authoritative specification and who can change it?

04 Who rejects a batch, even when rejecting it delays a restart?

05 When does temporary sourcing end, and how will partners be treated when normal capacity returns?

For the first 48 hours, write down owners, milestones and escalation paths. Distinguish a promise of capacity from demonstrated acceptable output. A useful review question is not simply “How many firms have offered help?” but “Which accepted kits will arrive, of which variants, at what time?”

> **Decision required**
> Choose a recovery structure and explain why its coordination costs are worth paying. Identify the one missing piece of information most likely to change your allocation of work.

COMPLETE BEFORE READING THE TEACHING NOTES

Your recovery mandate

My first 48 hours: workstreams, owners and milestones

Technical information we will share and how we will control it

Quality acceptance and authority to stop a release

Partner compensation and the rule for allocating scarce output

Bring it back to your business

Identify one supplier or partner whose failure would stop your service. Before a crisis, determine what information, access, tooling and skills a temporary replacement would need. A contact list is not a recovery capability.

One capability or relationship we should build before we need it

EVIDENCE REGISTER

Sources and reading notes

T1 AISIN, Safety and Health

Company account identifying the Kariya fire date and its continuing prevention work. Later source used only to corroborate the historical event.

Open source document →

T2 Whitney, Luo and Heller, 2013

Supply Chain Disruption Risk and Recovery: Temporary Diversification and Its Limits. MMRC Discussion Paper 433, printed pp. 8-12. Retrospective field research.

Open source document →

T3 Nishiguchi and Beaudet, research paper

Self-Organization and Clustered Control in the Toyota Group: Lessons from the Aisin Fire. Original research on network coordination; later published work also appears as The Toyota Group and the Aisin Fire.

Open source document →

T4 AISIN, Risk Management

Company reflection on the 1997 fire and enterprise risk management. Used in the teaching notes on page 12.

Open source document →

How this case was prepared

An original PB teaching reconstruction from published company material and research. It does not claim access to a contemporaneous decision meeting. Later accounts establish the starting conditions; recovery outcomes are reserved for the teaching notes on page 12. Exhibit 2 is wholly invented and must not be quoted as Toyota or Aisin data.

Research accounts differ in their supplier counts, sourcing shares and definitions of recovery. This case identifies its chosen source rather than combining all figures into a single supposedly precise account. Research checked 1 November 2026. No company approval or Harvard affiliation is implied.

> **Continue learning with Principled Business**
> Read the manifesto and explore member programs at principledbusiness.org. Ask how voluntary relationships become reliable capabilities before a crisis arrives.

TEACHING NOTES • READ AFTER COMPLETING THE DECISION

Worked analysis

In the invented ten-day exercise, opening stock covers days 1 and 2. Plan A supplies 5,000 kits during the horizon; with opening inventory it serves 7,000 of 10,000 units. Plan B supplies 6,000 kits and serves 8,000. Daily timing matters: later capacity cannot retroactively fill a lost unit.

Exercise result	Plan A	Plan B
Unfilled units	3,000	2,000
Direct recovery cost	$2.0m	$2.6m
Lost contribution at $1,000 per unit	$3.0m	$2.0m
Total modeled economic cost	$5.0m	$4.6m

Plan B avoids 1,000 lost units at an extra direct cost of $600,000. Its break-even contribution per avoided lost unit is $600. At the assumed $1,000, B is better by $400,000.

What happens when the output disappoints?

Reducing every B output figure by 10% yields 5,400 kits. Because there is no excess output to waste, total served falls to 7,400 and unfilled units rise to 2,600. The modeled cost becomes $2.6m + $2.6m = $5.2m, which is $200,000 worse than A. This is a sensitivity calculation, not an estimate of historical defect rates.

The operating recommendation

The model supports parallel recovery only if the additional usable capacity arrives when needed and the cost of delay is sufficiently high. A good plan pairs distributed problem solving with a controlled technical interface, acceptance rules and a visible schedule. It also specifies the consequences if a partner’s promised capacity does not qualify.

Do not accept “trust the suppliers” as a complete plan. Ask who checks the specification, who owns the gauges, who approves release and how conflicting requests for the same engineer are settled. Conversely, centralized approval of every minor action can consume the very time the network is meant to save.

> **Common mistake**
> Counting participating firms as capacity. A firm can help with tools, logistics or information without producing an accepted part. Measure the output needed by the consuming process.

TEACHING NOTES • READ AFTER COMPLETING THE DECISION

Outcome and teaching plan

The later field study reports that two Toyota assembly plants reopened on 6 February and group plants regained pre-disaster output by 10 February. It describes more than 200 participating companies, with approximately 62 directly producing valves, alongside substantial internal recovery work. [T2, printed p. 11]

The historical recovery should not be read as proof that all specialized supply can be reproduced quickly. Nor should it erase the cost and vulnerability of the initial concentration. AISIN describes the fire as a catalyst for company-wide risk management. [T4]

Minutes	Discussion and board plan
0-10	Vote on the recovery structure; list non-negotiable quality requirements.
10-25	Board left: inventory, damaged process and surviving capabilities.
25-40	Board center: exercise costs, break-even and output sensitivity.
40-55	Board right: decision rights, partner incentives and information sharing.
55-65	Agree the first 48-hour mandate and escalation rules.
65-75	Reveal the recovery; distinguish preparedness from improvisation.

Questions that deepen the discussion

01 Which work can be decentralized safely, and what must remain under a common authority?

02 Would a supplier’s agreement be meaningfully voluntary if refusing help threatened all future business? What evidence would help assess that?

03 What is the best use of the next resilience dollar: stock, duplicate tooling, alternate suppliers, fire prevention or better technical documentation?

Transfer assignment

Run a tabletop exercise for one real dependency in your business. Ask a potential replacement to identify what would prevent it from delivering within the required time. Record gaps in tooling, permissions, data and skills; do not settle for a verbal promise of help.

Historical sources T2 and T4 are linked on page 10. The recovery dates describe different stages; “first restart,” “normal group output” and “full restoration of the damaged supplier” are not interchangeable.