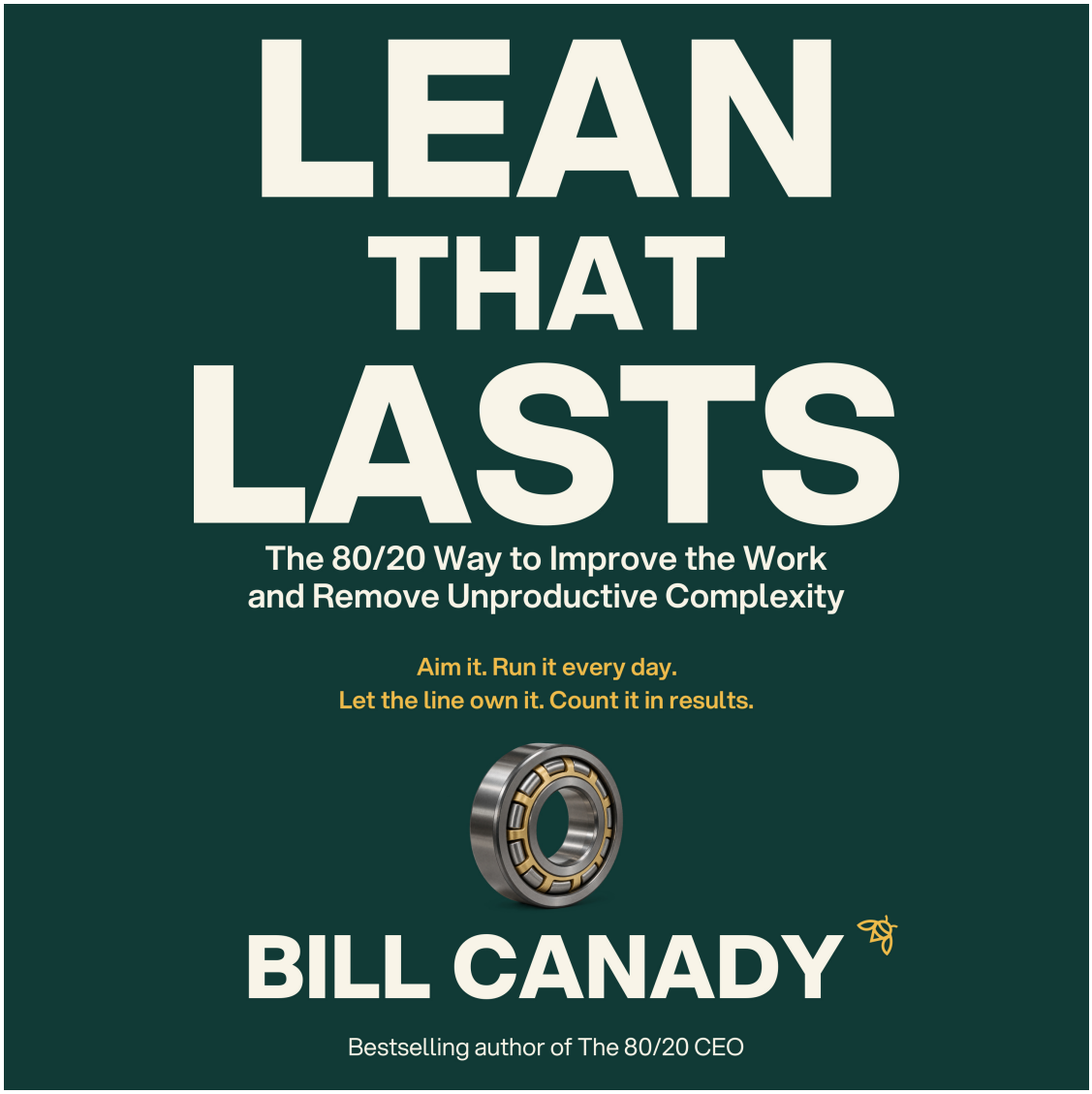
AUDIOBOOK VISUAL COMPANION



Figures, reference tables and Put It to Work

A listening reference for the audiobook by Bill Canady. The complete Field Guide is sold separately.

How to use this companion

Keep this PDF beside the audiobook when a figure, table or written exercise is discussed. Figure 8.4 in the narration is the source figure labeled 08-04 here; both labels identify the same artwork.

All thirty main-book figures appear as the approved original vector artwork. The full figure remains on its overview page. Two dense value-stream maps also have enlarged detail pages for easier reading.

Four reference tables are included, followed by the book's eight-page Put It to Work section with its eight forms. Use the linked contents or PDF bookmarks to jump directly to any item.

The full 150-page, forty-worksheet Lean That Lasts · The Field Guide is a separate paid book. It is not included in this listening companion. The short forms included here are the pages already in the main book.

Content follows the approved corrected r3 acknowledgment-revision-1 book. Source figure labels, values and wording are preserved. Use the tools you have, tie the numbers to the work, and make the decision as a team.

The complete Glossary and Notes on Sources are also included as reference sections at the end of this PDF. The audiobook points to these sections instead of reading every definition or citation aloud.

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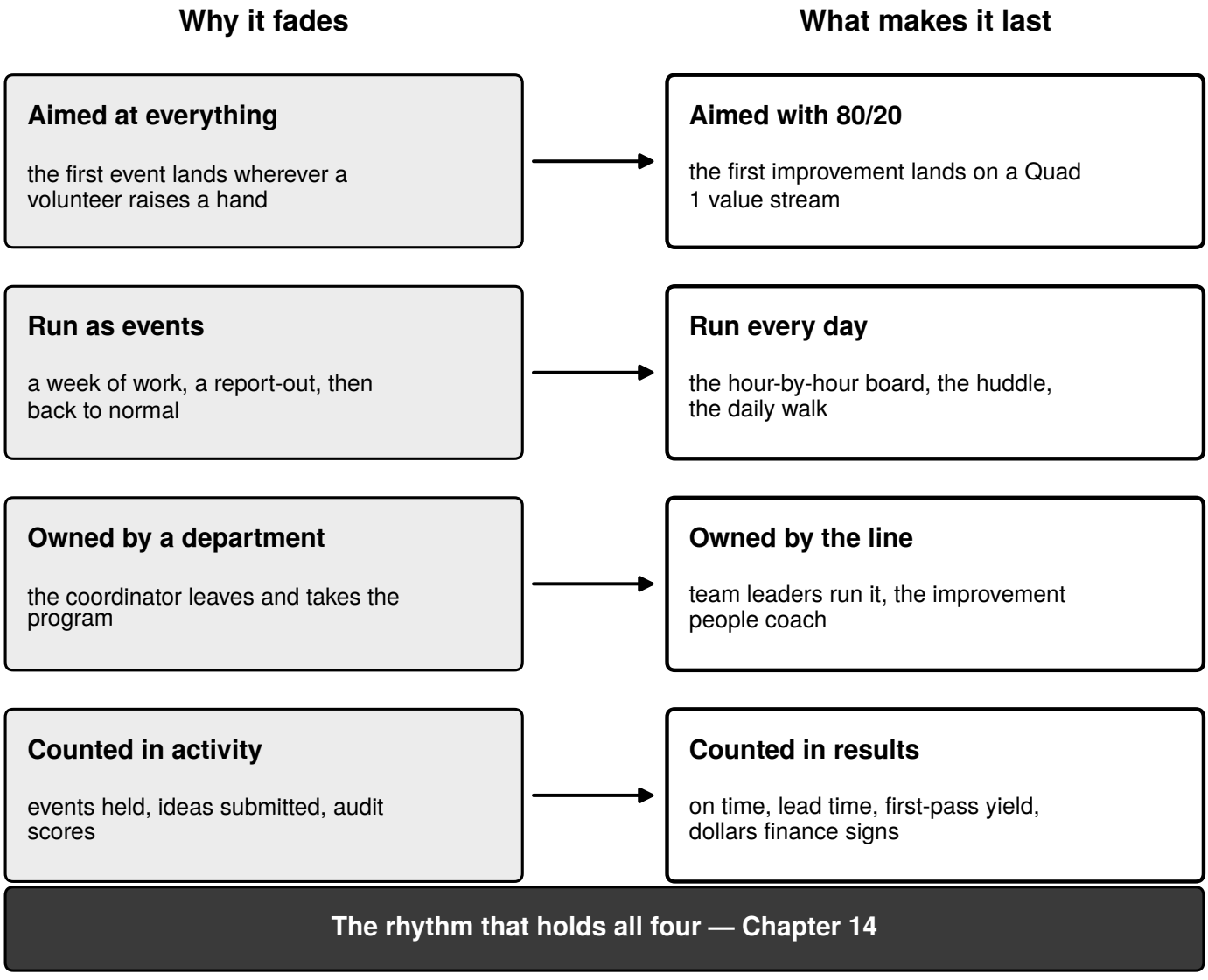
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Figure 1.1 · Why Lean fades, and what makes it last

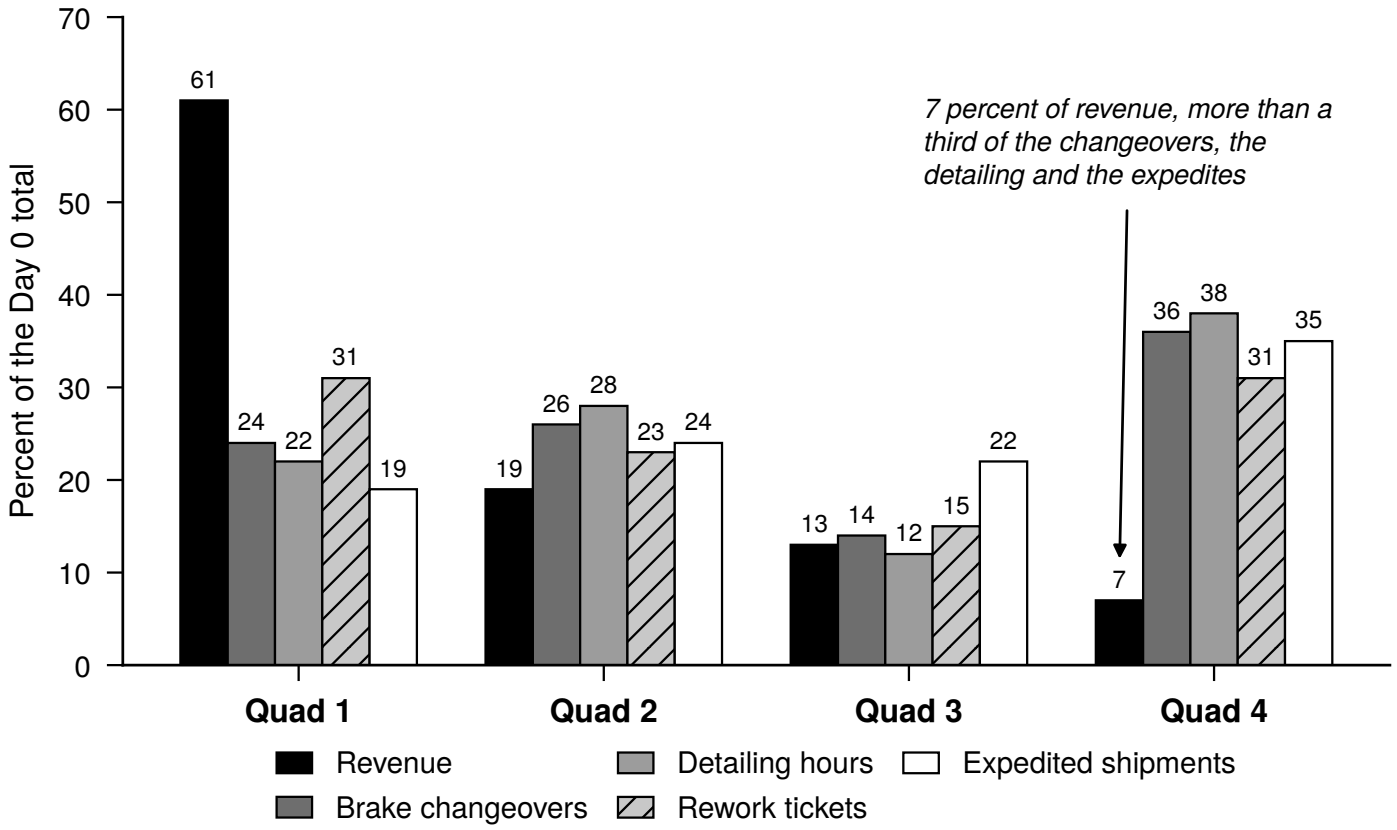
Chapter 1: Aim Before You Improve | Source figure 01-01 | Book PDF page 25



Why Lean fades, and what makes it last: four mistakes, four antidotes, and the rhythm that holds them.

Figure 1.2 · The Quad of the work at Brennick, Day 0

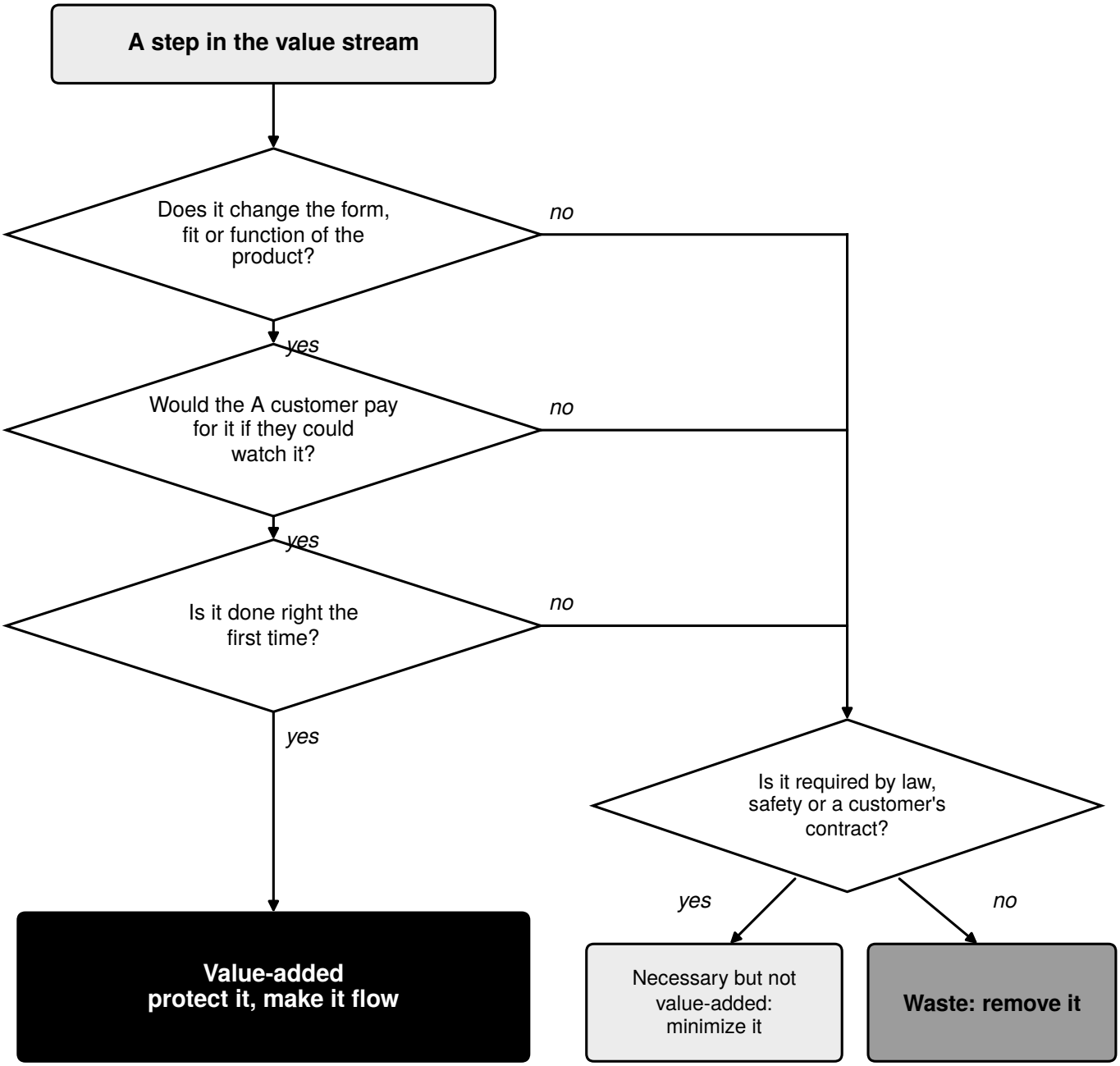
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The Quad of the work at Brennick, Day 0: Quad 4 brings in 7 percent of the revenue and consumes between 31 and 38 percent of every kind of hard work the plant counts.

Figure 2.1 · The value-add test

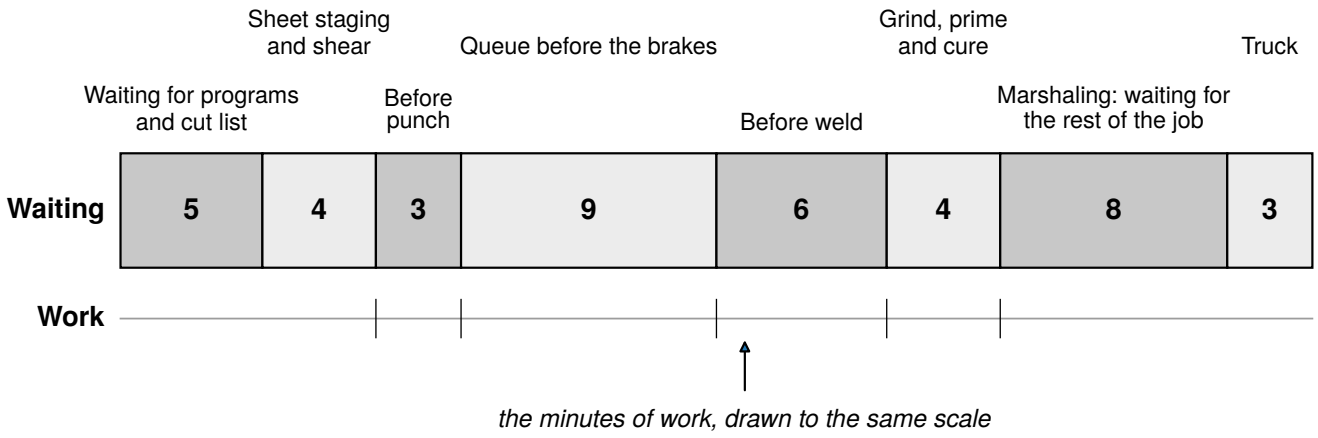
Chapter 2: Value Is What the A Customer Pays For | Source figure 02-01 | Book PDF page 36



The value-add test: three questions a step must pass to count as value-added, and the two bins for every step that fails.

Figure 2.2 · Forty-two days, forty-eight minutes: the life of a welded frame at Brennick, Day 9

Chapter 2: Value Is What the A Customer Pays For | Source figure 02-02 | Book PDF page 39

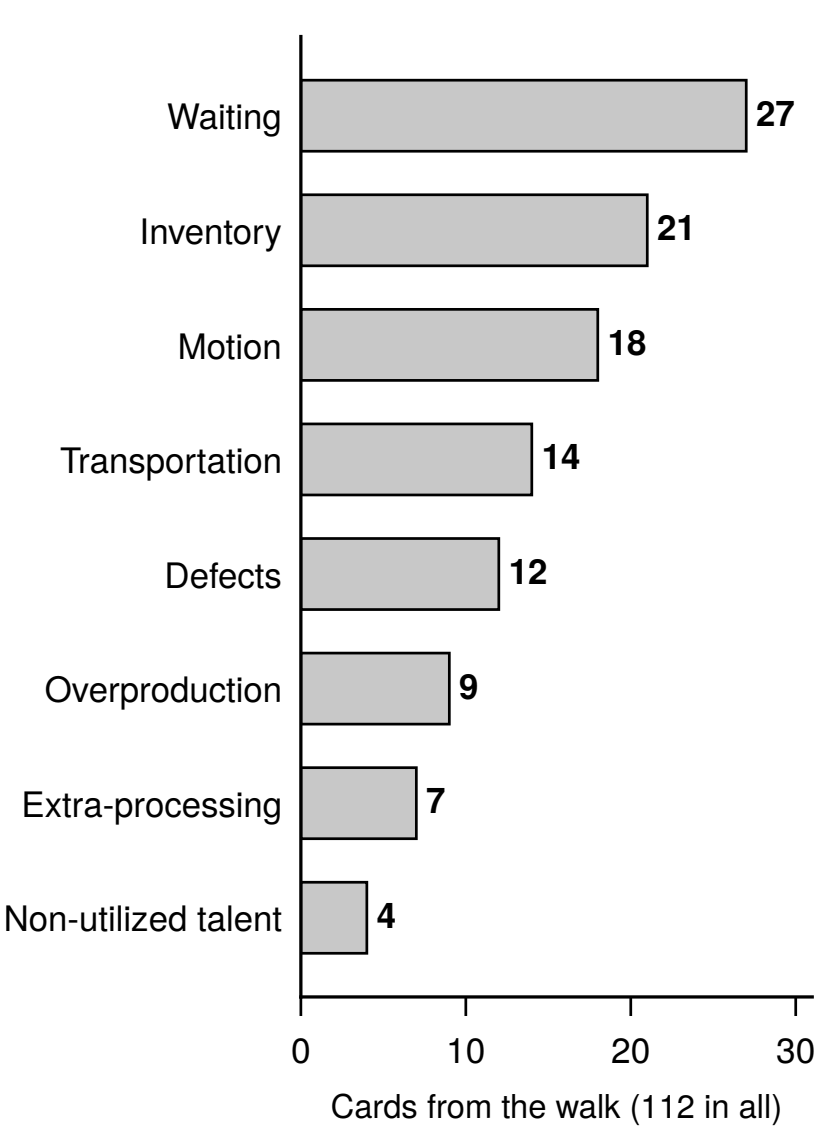


Lead time 42 working days = 40,320 minutes of plant time on two shifts. Work that changes the frame: 48 minutes, 30 of them in the cure oven. **One minute of work in 840.**

Forty-two days, forty-eight minutes: the life of a welded frame at Brennick on Day 9, released order to shipped, with the work drawn to scale.

Figure 3.1 · The eight wastes and Brennick's Day 14 waste walk

Chapter 3: Learn to See the Waste | Source figure 03-01 | Book PDF page 43



One example from the walk

parts for a 36-frame job wait nine days for a brake run

4,300 formed pieces between the brakes and weld

140 feet to the die rack for every changeover

a finished frame moved four times between weld and the dock

a hinge prep in the wrong place, found at final inspection

frames run ahead of the job's phase to fill a brake run

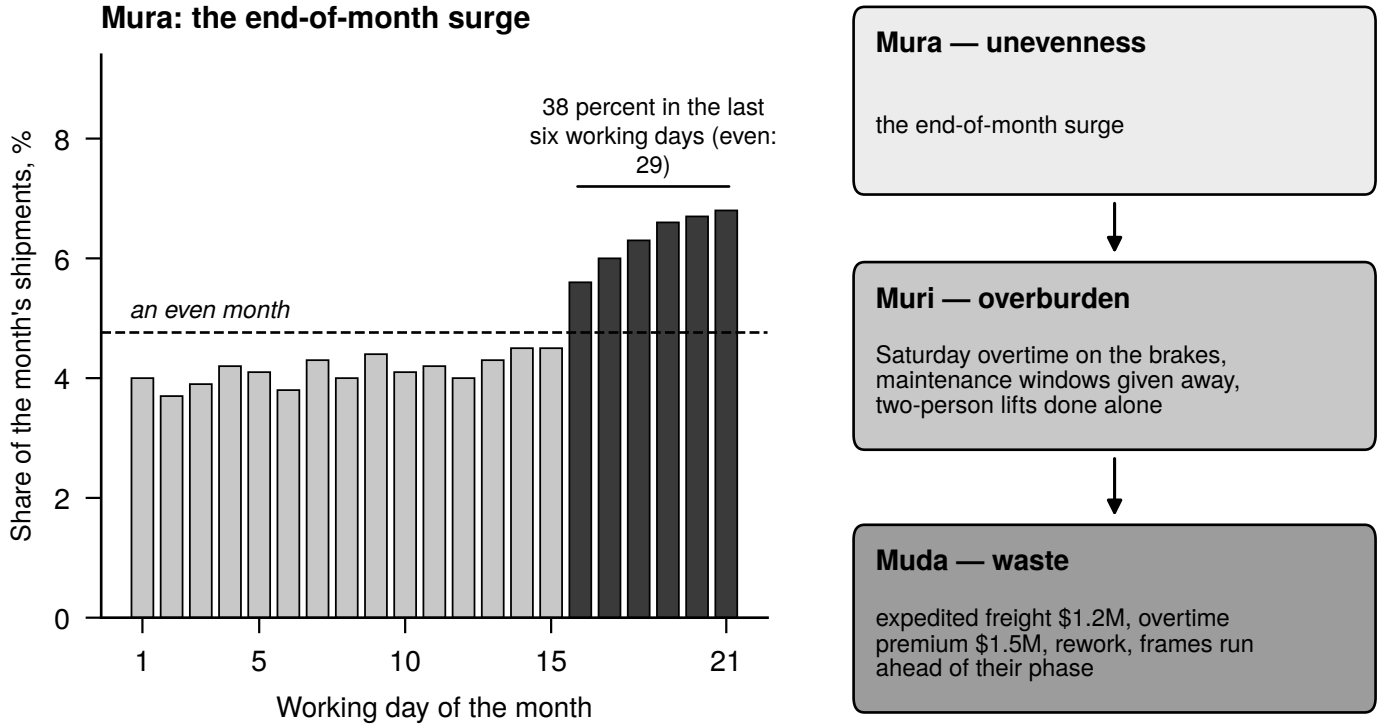
fourteen primer colors, painted over on site

a die-cart idea, number 212, status: under review

The eight wastes and Brennick's Day 14 waste walk: 112 cards from ninety minutes along the welded-frame value stream, sorted by count, with one example of each.

Figure 3.2 · Mura, muri, muda at Brennick

Chapter 3: Learn to See the Waste | Source figure 03-02 | Book PDF page 44



Mura, muri, muda at Brennick: the end-of-month surge, the overburden it creates, and the waste the overburden leaves behind.

Figure 4.1 · The 5S ladder

Chapter 4: Make the Workplace Speak | Source figure 04-01 | Book PDF page 52

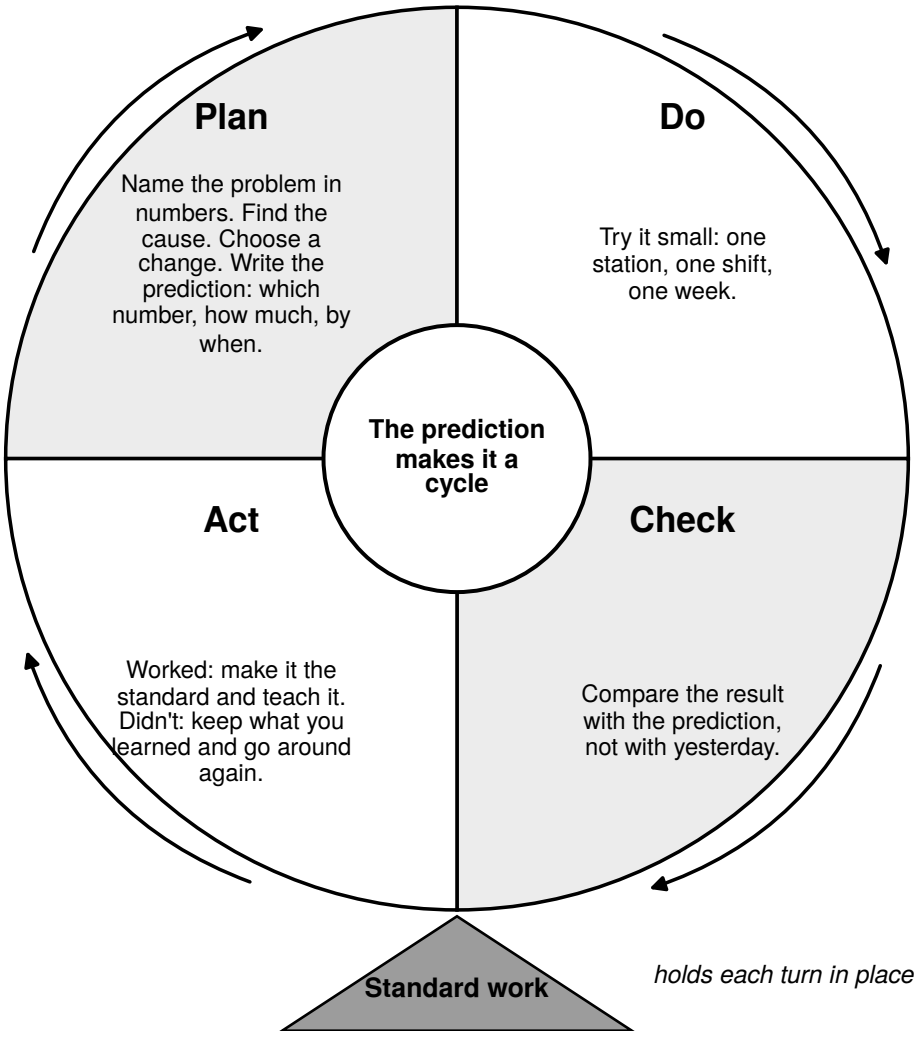
	1 Not started	2 First pass	3 Standard in place	4 Sustained 3 months	5 Improved by the team
Sort	Nothing tagged	Red tags hung by the team ○	Red-tag area empty within 30 days	No new red tags needed for 3 months ■	Team set its own tag rule
Set in order	Things live where they fit	Homes chosen with the team ○	Every item has an address, found in 30 s	Addresses held for 3 months ■	Team moved items closer to use
Shine	Cleaned when visitors come	First deep clean ○	Cleaning standard posted, tags answered by a date	No repeat abnormality for 3 months ■	Team removed a source of dirt
Standardize	Nothing written	Photo taken ○	Photo at every station, 5-minute routine written ■	Routine done every shift for 3 months	Team revised its own standard
Sustain	Audited before visits	Leader looks weekly ○	Team leader checks daily, manager weekly ■	Checks held 3 months, on the board	Team audits a neighbor area

○ Cell 1, Day 37 ■ Cell 1, Day 200

The 5S ladder, five steps by five rungs, with Brennick's Cell 1 at Day 37 and at Day 200.

Figure 5.1 · Plan, do, check, act

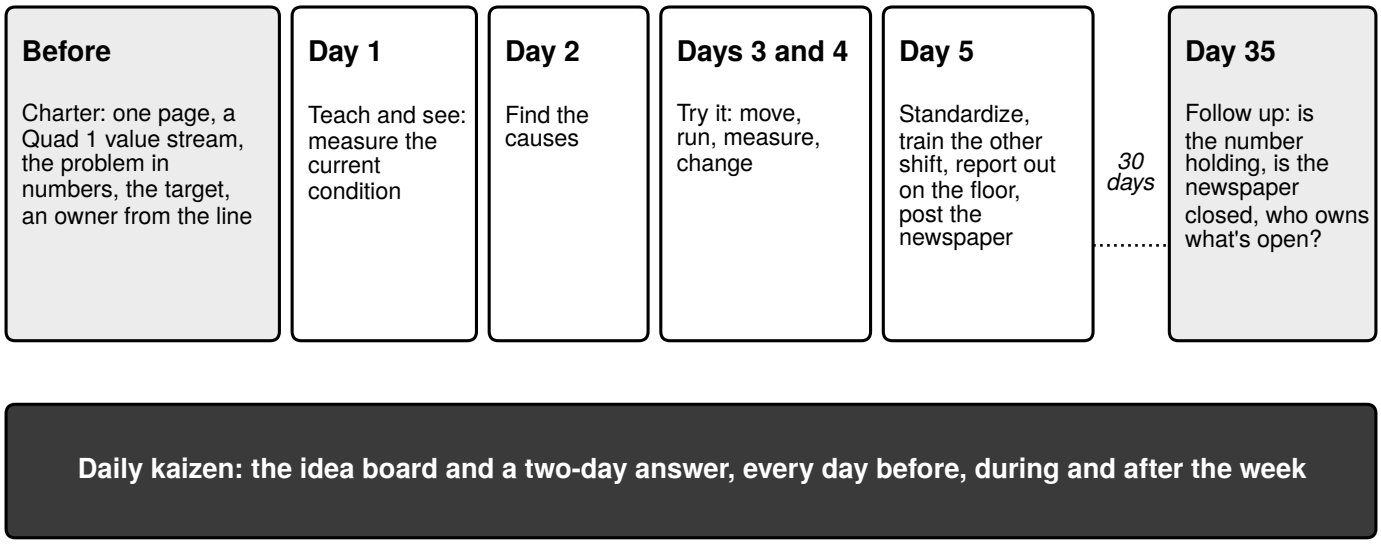
Chapter 5: Small Changes, Every Day | Source figure 05-01 | Book PDF page 61



Plan, do, check, act, with the prediction at its center and standard work holding each turn in place.

Figure 5.2 · The kaizen week

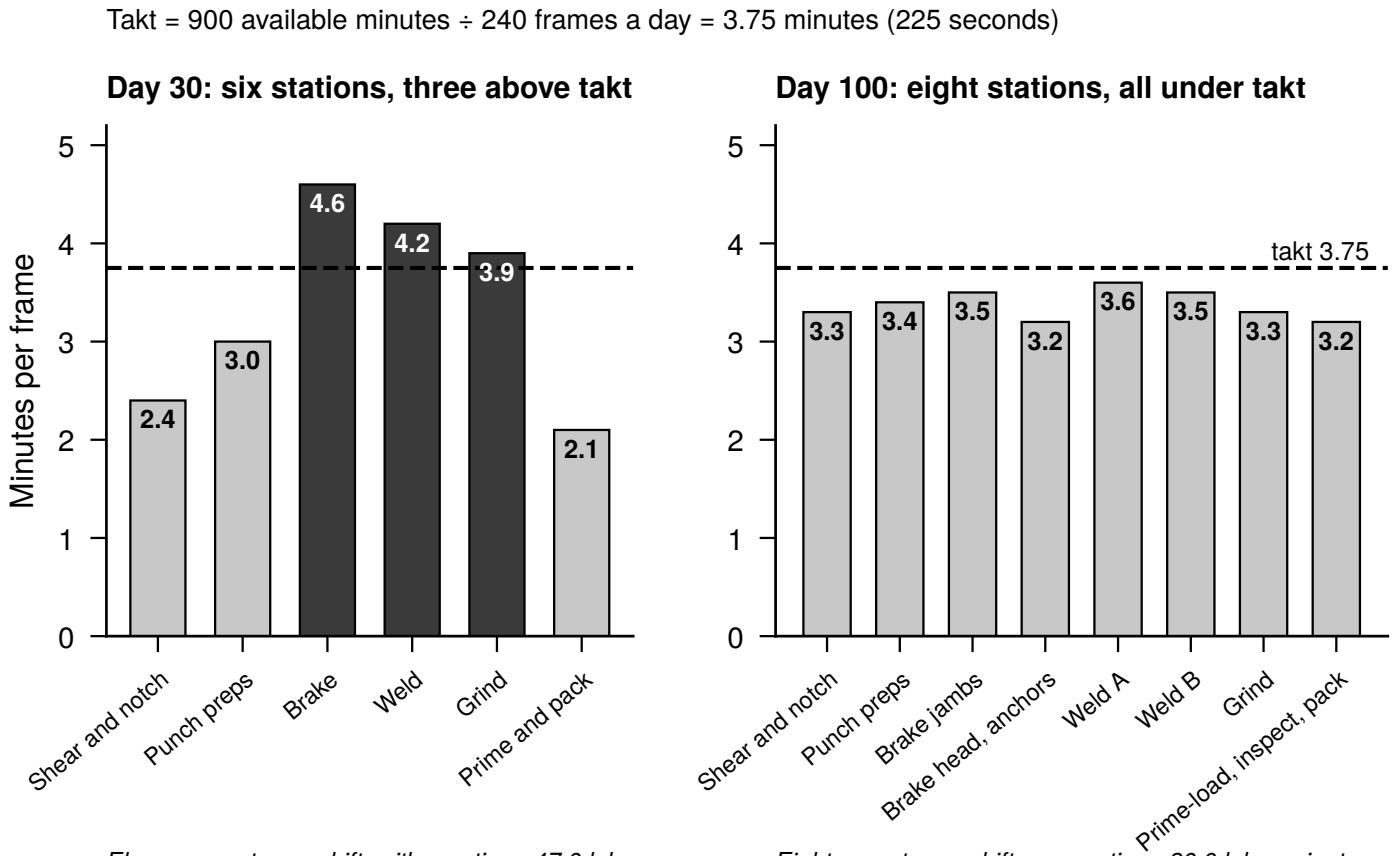
Chapter 5: Small Changes, Every Day | Source figure 05-02 | Book PDF page 63



The kaizen week, from charter to the thirty-day follow-up, with the daily kaizen running under it the whole time.

Figure 6.1 · Takt and cycle on Cell 1, Day 30 and Day 100

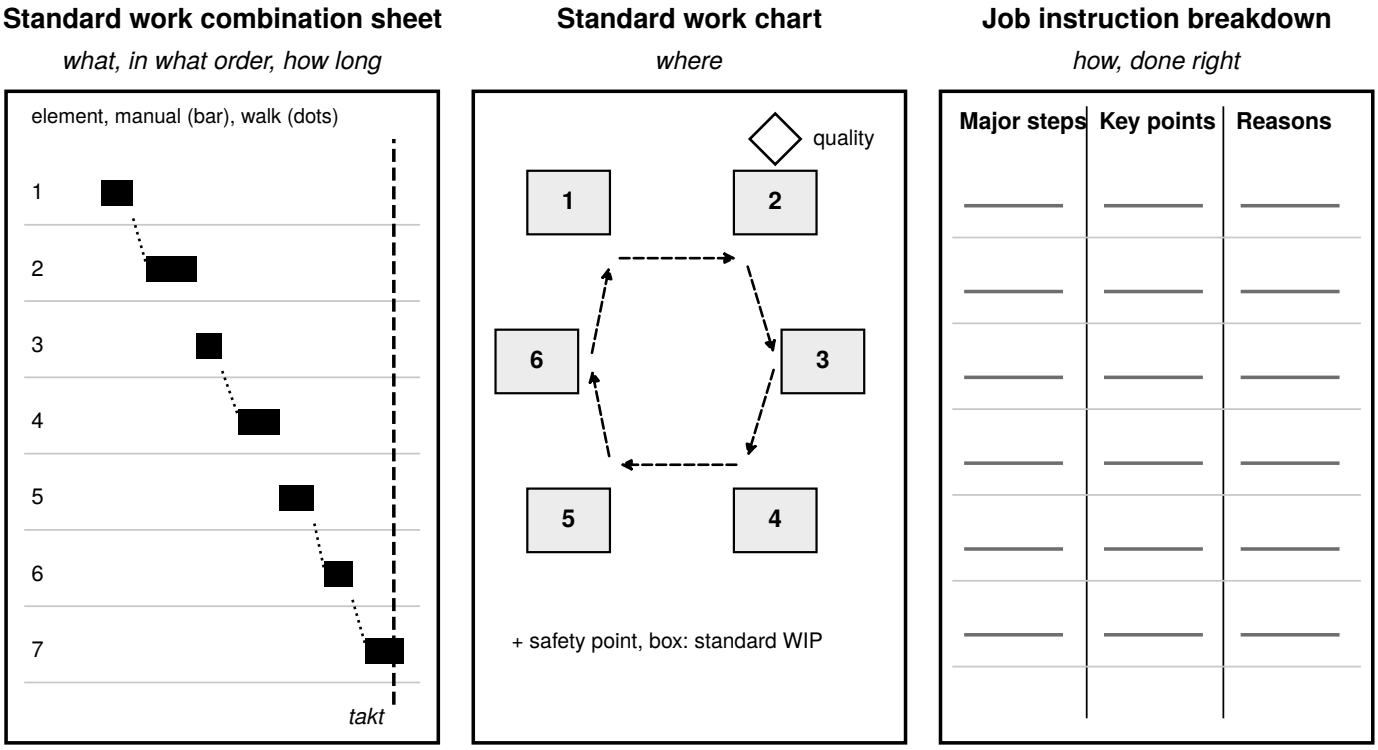
Chapter 6: Write the Best Way Down | Source figure 06-01 | Book PDF page 70



Takt and cycle on Cell 1: six unbalanced stations at Day 30, three of them above takt, and eight balanced stations at Day 100.

Figure 6.2 · The three documents of standard work

Chapter 6: Write the Best Way Down | Source figure 06-02 | Book PDF page 71



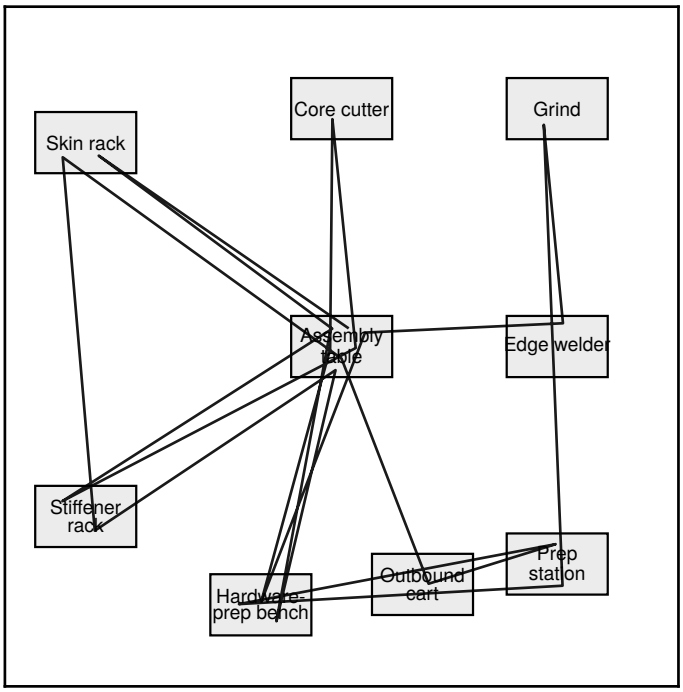
Written by the people who do the work. Dated, versioned, posted at the station.

The three documents of standard work, and the question each one answers.

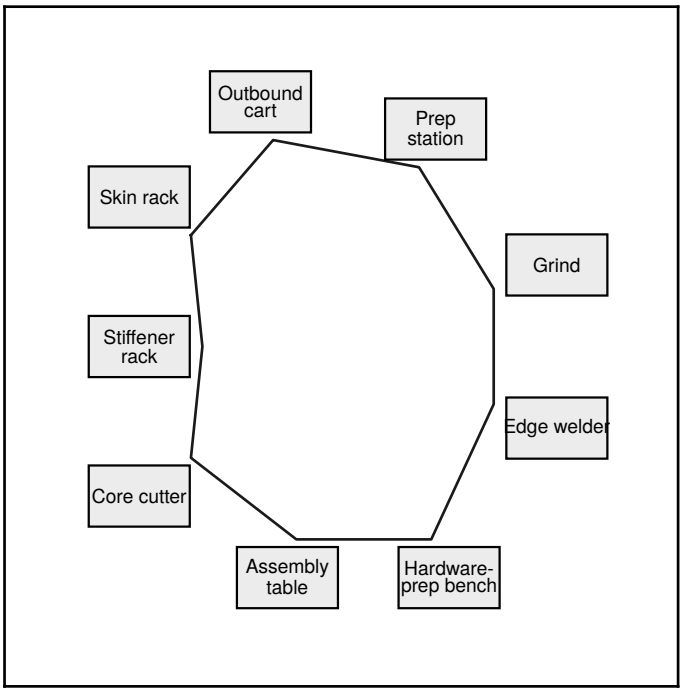
Figure 7.1 · The spaghetti diagram, door line, Day 110 and Day 118

Chapter 7: Go and See | Source figure 07-01 | Book PDF page 80

Day 110: 2.6 miles a shift



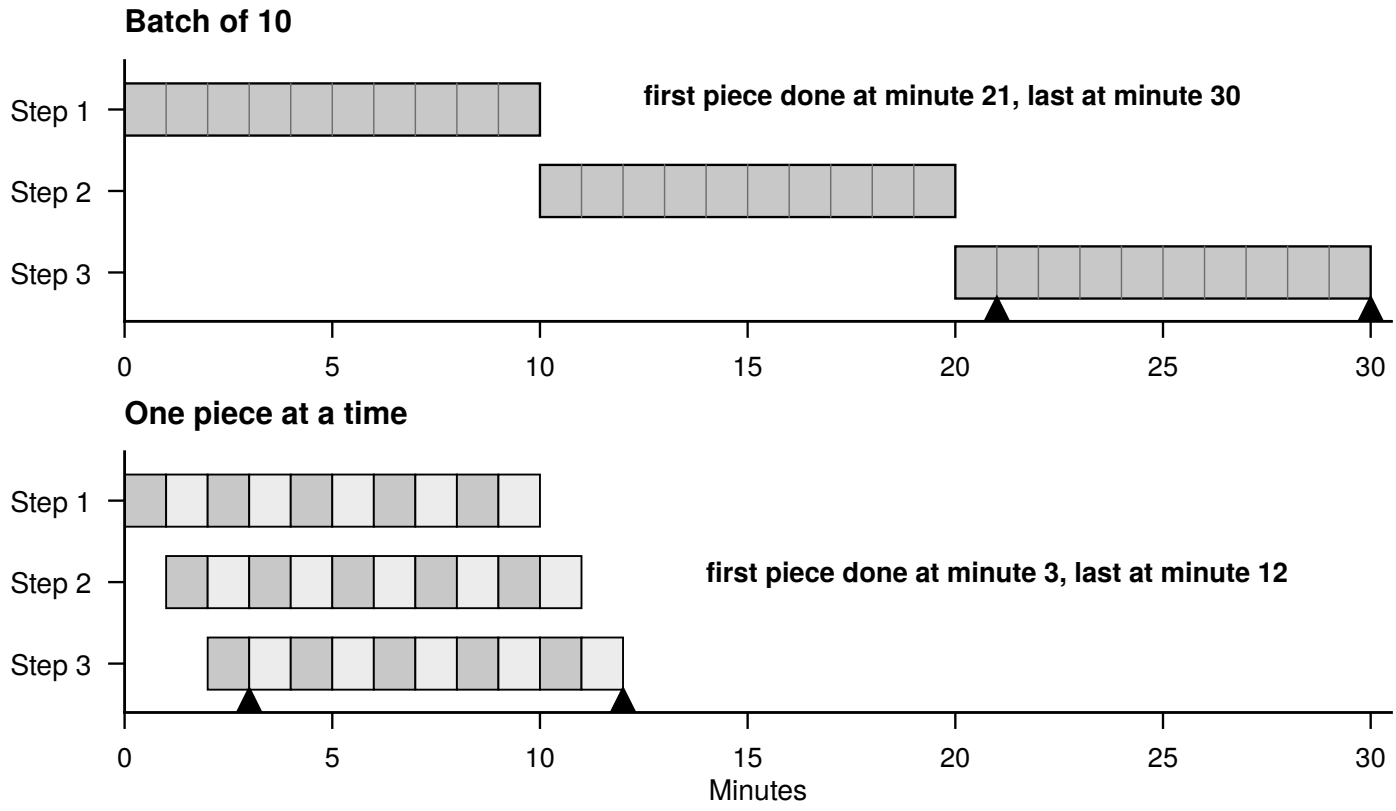
Day 118: 0.8 miles a shift



The spaghetti diagram on Brennick's door line: one assembler's path for an hour at Day 110, and again at Day 118 after the team moved the material to the point of use.

Figure 7.2 · Batch versus one-piece flow

Chapter 7: Go and See | Source figure 07-02 | Book PDF page 80

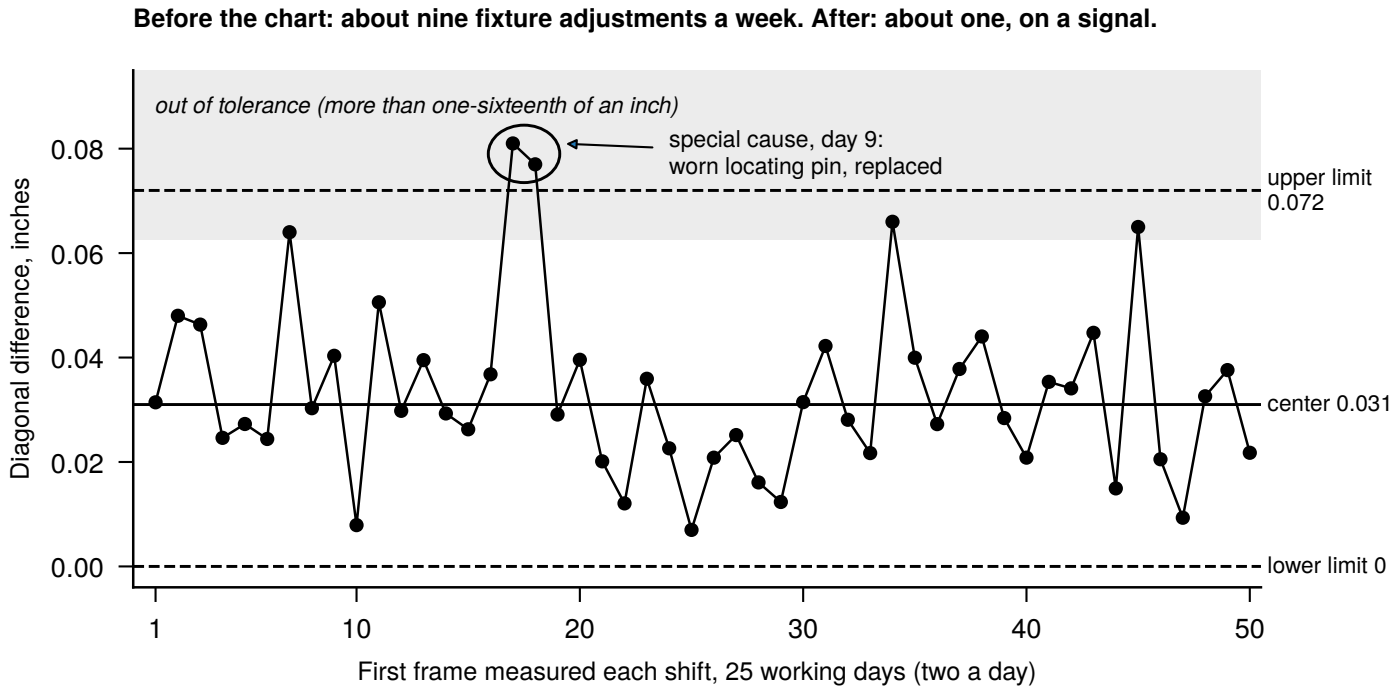


Same work, same machines, same people. The batch waits eighteen minutes longer, needs racks to wait on, and makes ten defects before step 3 can find one.

Batch versus one-piece flow: ten pieces through three one-minute steps.

Figure 7.3 · A control chart for frame squareness, Cell 1

Chapter 7: Go and See | Source figure 07-03 | Book PDF page 81



A control chart for frame squareness on Cell 1: a stable process with one special cause, and a rule for when to touch the fixture.

Figure 8.1 · The hour-by-hour board, Cell 1, first shift, a Tuesday in week ten

Chapter 8: Make It Visible | Source figure 08-01 | Book PDF page 89

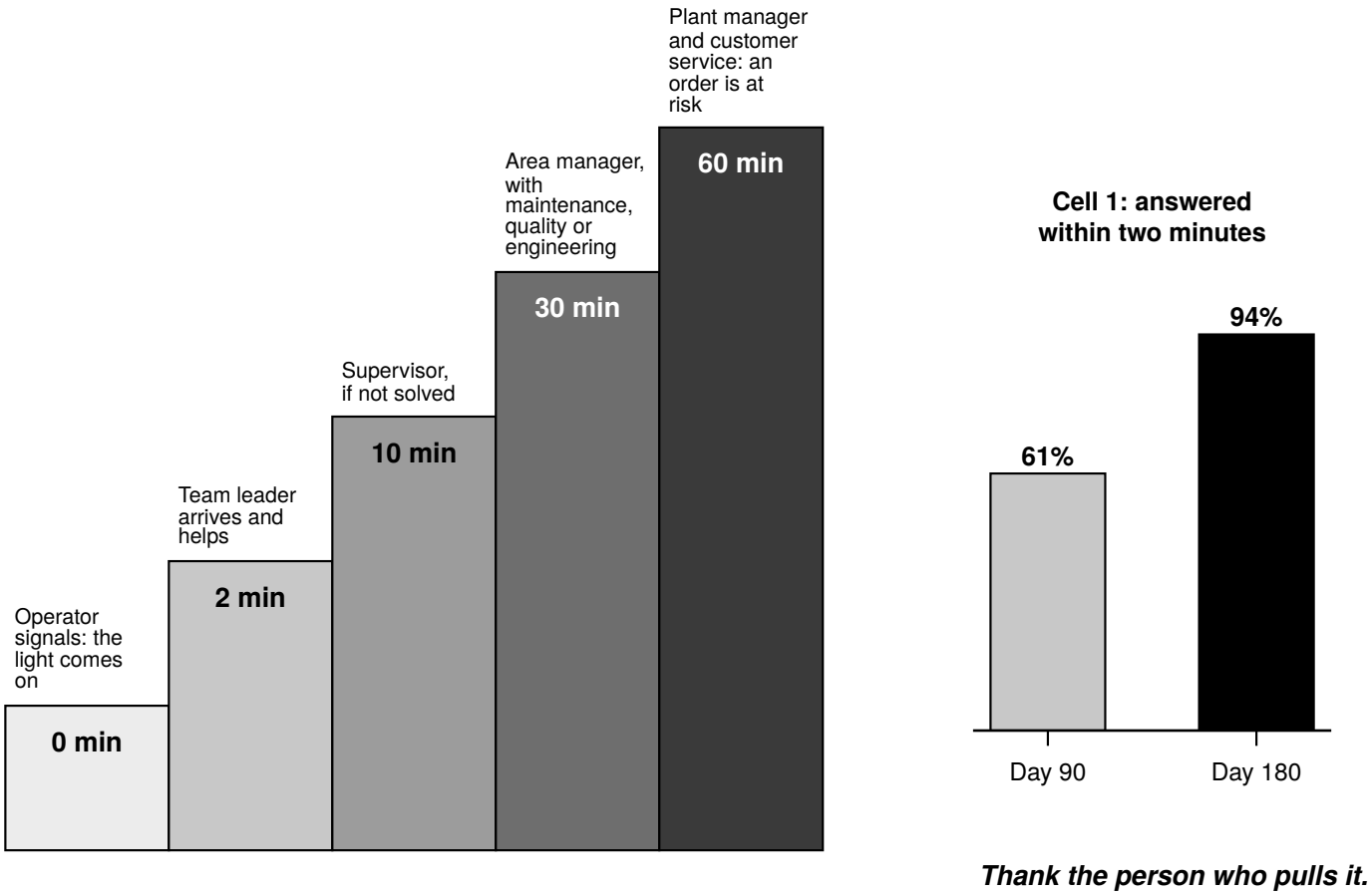
Hour	Plan hour / cum.	Actual hour / cum.	Gap	Reason for the miss	Action, and who
6:00	15 / 15	*15 / 15*	0		
7:00	16 / 31	*16 / 31*	0		
8:00	13 / 44	*13 / 44*	0		
9:00	16 / 60	*12 / 56*	-4	*waiting for heads: brake changeover ran long*	*Roland: die staged before the next changeover*
10:00	16 / 76	*16 / 72*	-4		
11:00	13 / 89	*14 / 86*	-3		
12:00	16 / 105	*16 / 102*	-3		
13:00	15 / 120	*13 / 115*	-5	*hinge-prep template missing at punch*	*Luz: template tray labeled and shadowed*

Plan from takt: 16 in a full hour, fewer in the hours with the huddle, a break or the five-minute 5S. Plan for the shift: 120. Supervisor's initials at 8:00, 11:00 and 14:00. Handwriting in italics.

The hour-by-hour board on Cell 1: plan, actual and gap every hour, with a reason and an action beside every miss.

Figure 8.2 · The andon response ladder

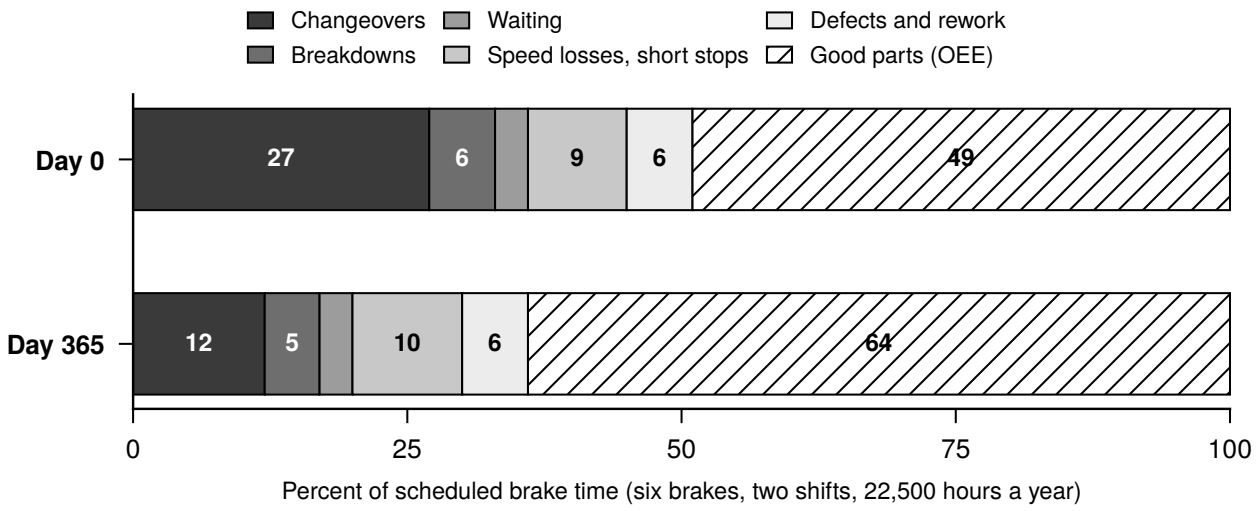
Chapter 8: Make It Visible | Source figure 08-02 | Book PDF page 90



The andon response ladder: who comes, and how fast, when an operator asks for help.

Figure 8.3 · Where the press brakes' time went, Day 0 and Day 365

Chapter 8: Make It Visible | Source figure 08-03 | Book PDF page 91

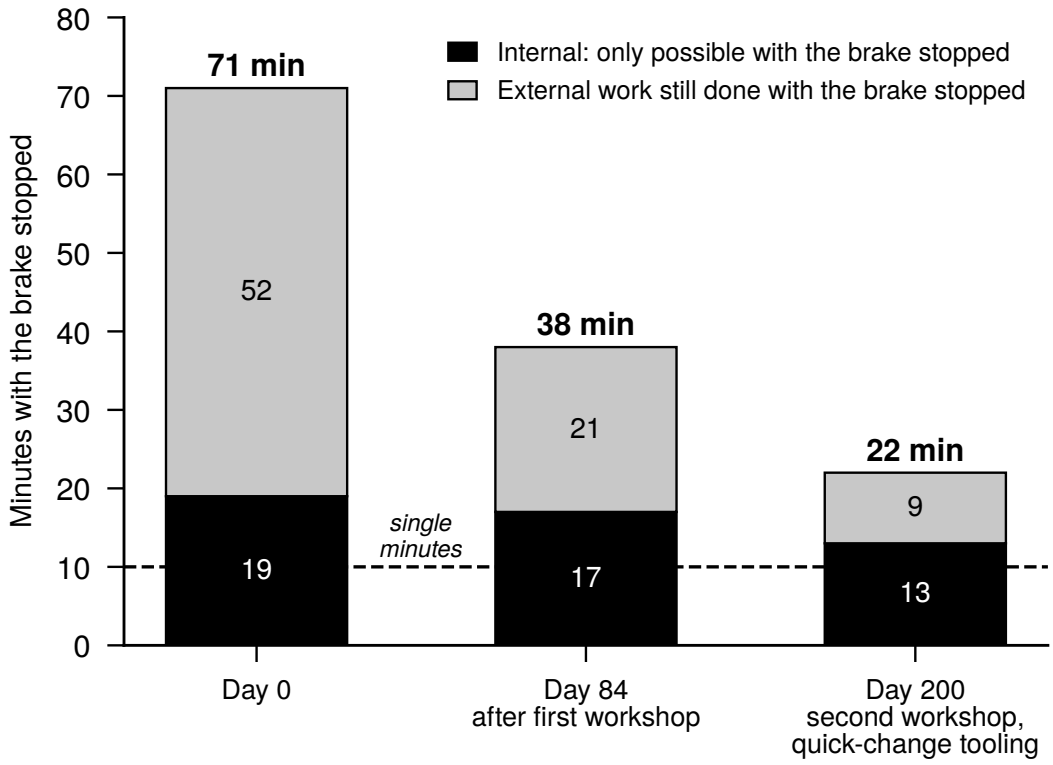


OEE = availability × performance × quality. Day 0: 0.64 × 0.86 × 0.89 = 49 percent. Day 365: 0.80 × 0.88 × 0.91 = 64 percent.

Where the press brakes' time went at Day 0 and at Day 365: changeovers cut by more than half, and overall equipment effectiveness from 49 to 64 percent.

Figure 8.4 · Changeover on the press brakes, from 71 minutes to 22

Chapter 8: Make It Visible | Source figure 08-04 | Book PDF page 93

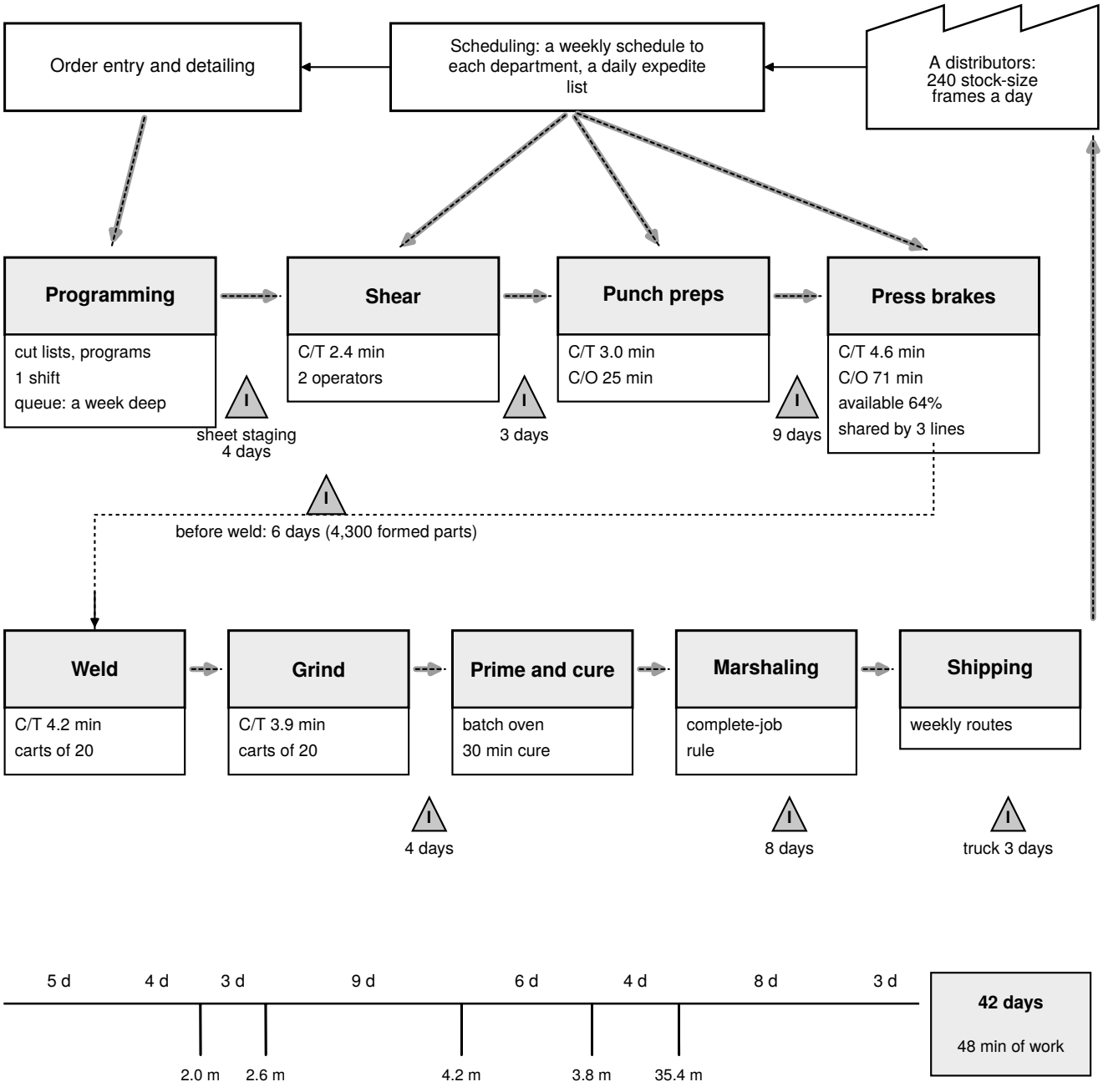


External work moved outside the stop: stage the die, load the program, mount the first-piece gauge. Internal work shortened: quick clamps, standard die heights.

Changeover on Brennick's press brakes: external work moved outside the stop by Day 84, internal work shortened by Day 200.

Figure 9.1 · The welded-frame value stream, current state, as drawn on Days 21 to 25

Chapter 9: Map the Flow | Source figure 09-01 | Book PDF page 99



Five schedules on the floor: the weekly plan, the programming queue, the brake operators' own sequence, the expedite list and the truck routes.

Queues in working days above the timeline. Below it, the minutes of work that change a frame. C/T cycle time, C/O changeover.

The welded-frame value stream at Brennick, current state: eight queues, a weekly push schedule, forty-two working days, forty-eight minutes of work.

Figure 9.1 · Upper detail

Enlarged original artwork. The complete map is on the preceding overview page.

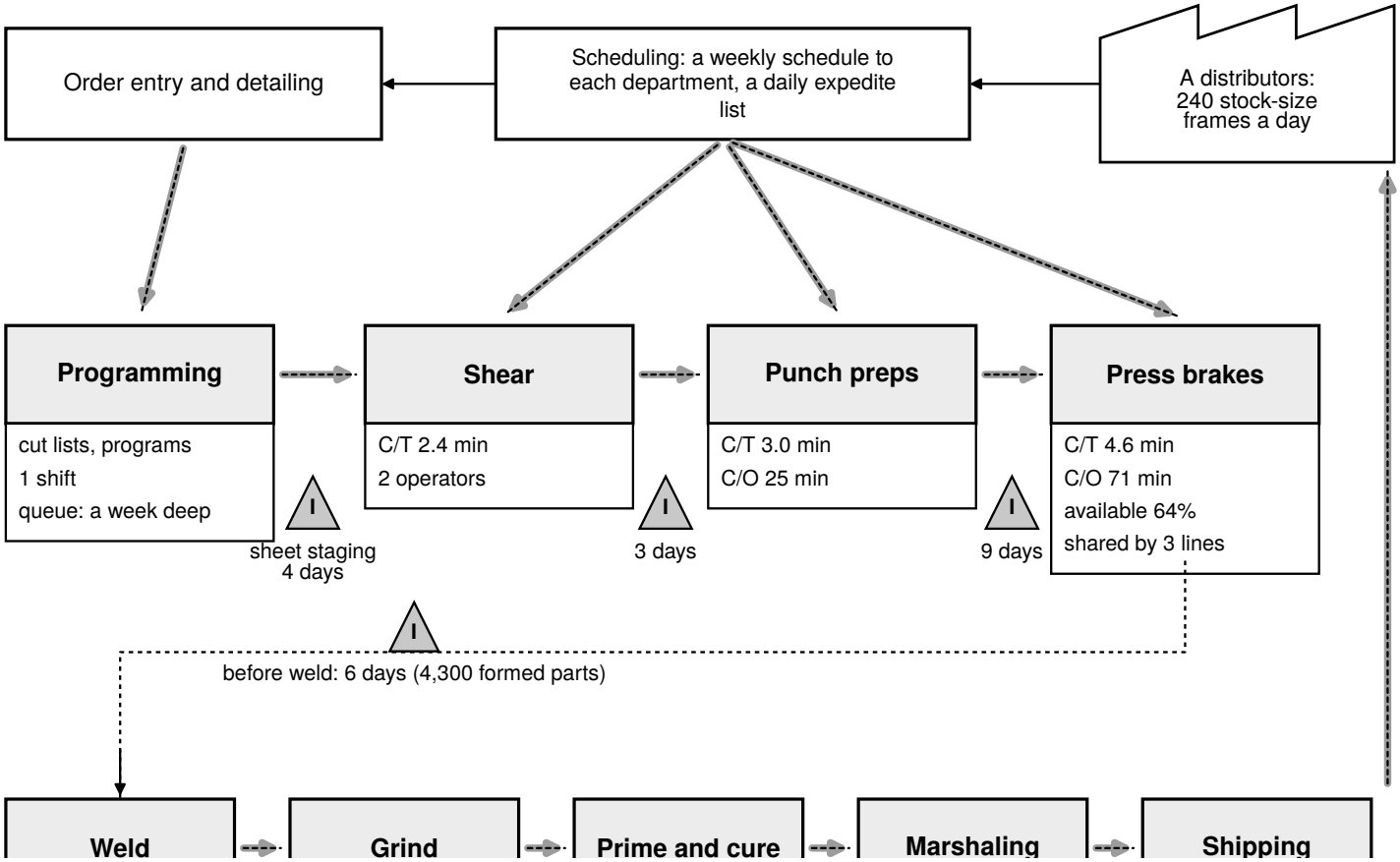
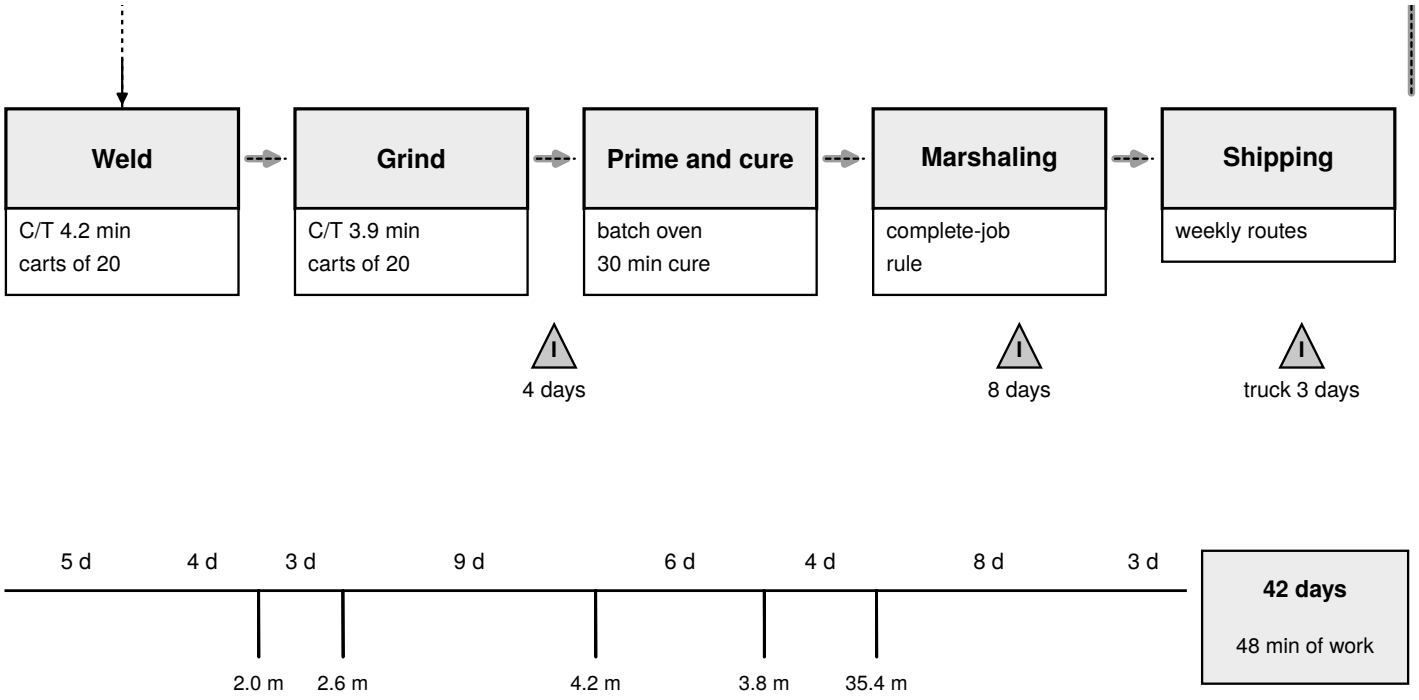


Figure 9.1 · Lower detail

Enlarged original artwork. The complete map is on the preceding overview page.

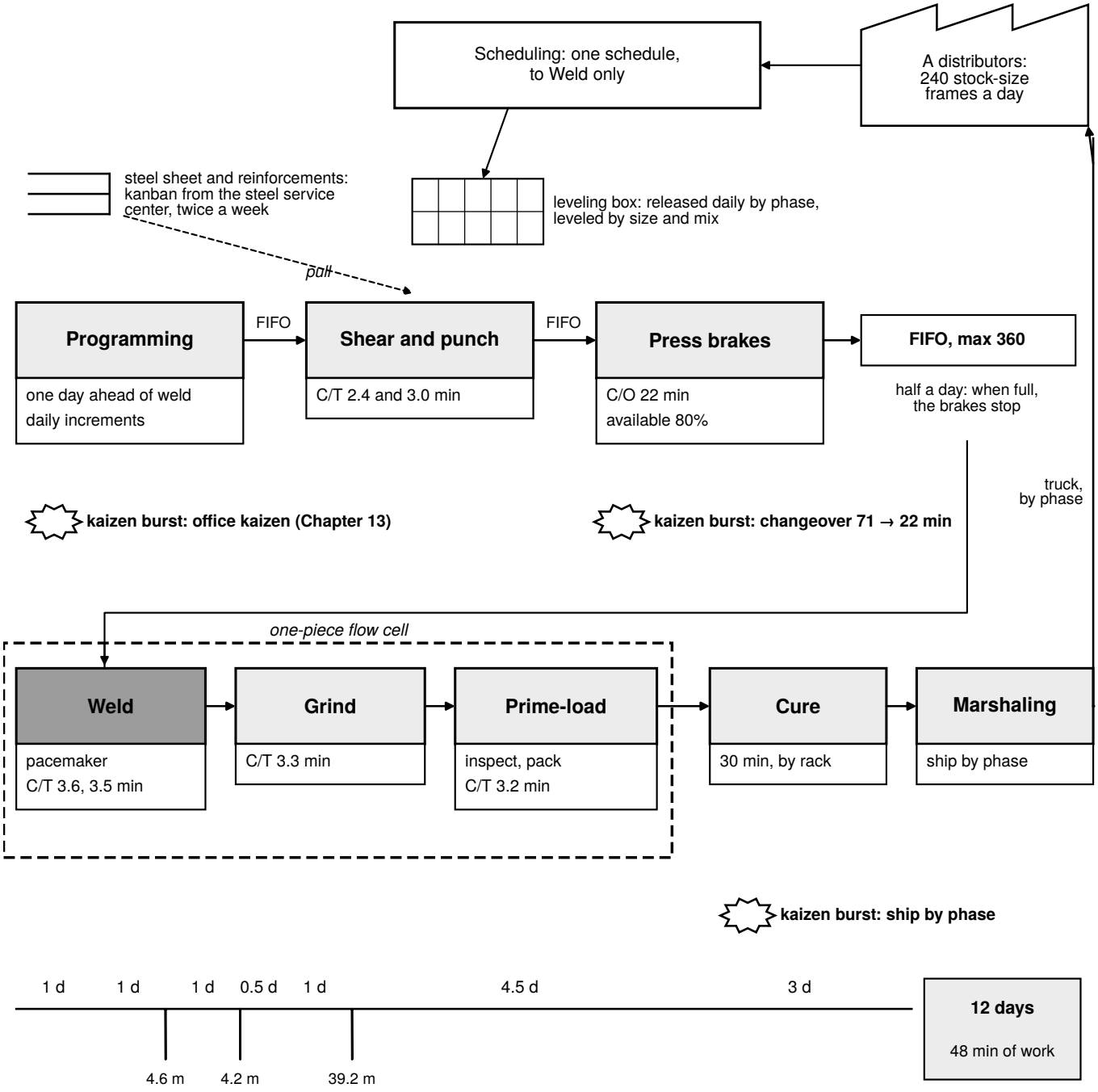


Five schedules on the floor: the weekly plan, the programming queue, the brake operators' own sequence, the expedite list and the truck routes.

Queues in working days above the timeline. Below it, the minutes of work that change a frame. C/T cycle time, C/O changeover.

Figure 9.2 · The welded-frame value stream, future state for Day 365

Chapter 9: Map the Flow | Source figure 09-02 | Book PDF page 101



The work per frame is unchanged at 48 minutes. The waiting fell from 42 working days to 12.

The welded-frame value stream, future state for Day 365: one schedule at the pacemaker, flow and FIFO lanes in place of queues, kanban on the steel, twelve working days.

Figure 9.2 · Upper detail

Enlarged original artwork. The complete map is on the preceding overview page.

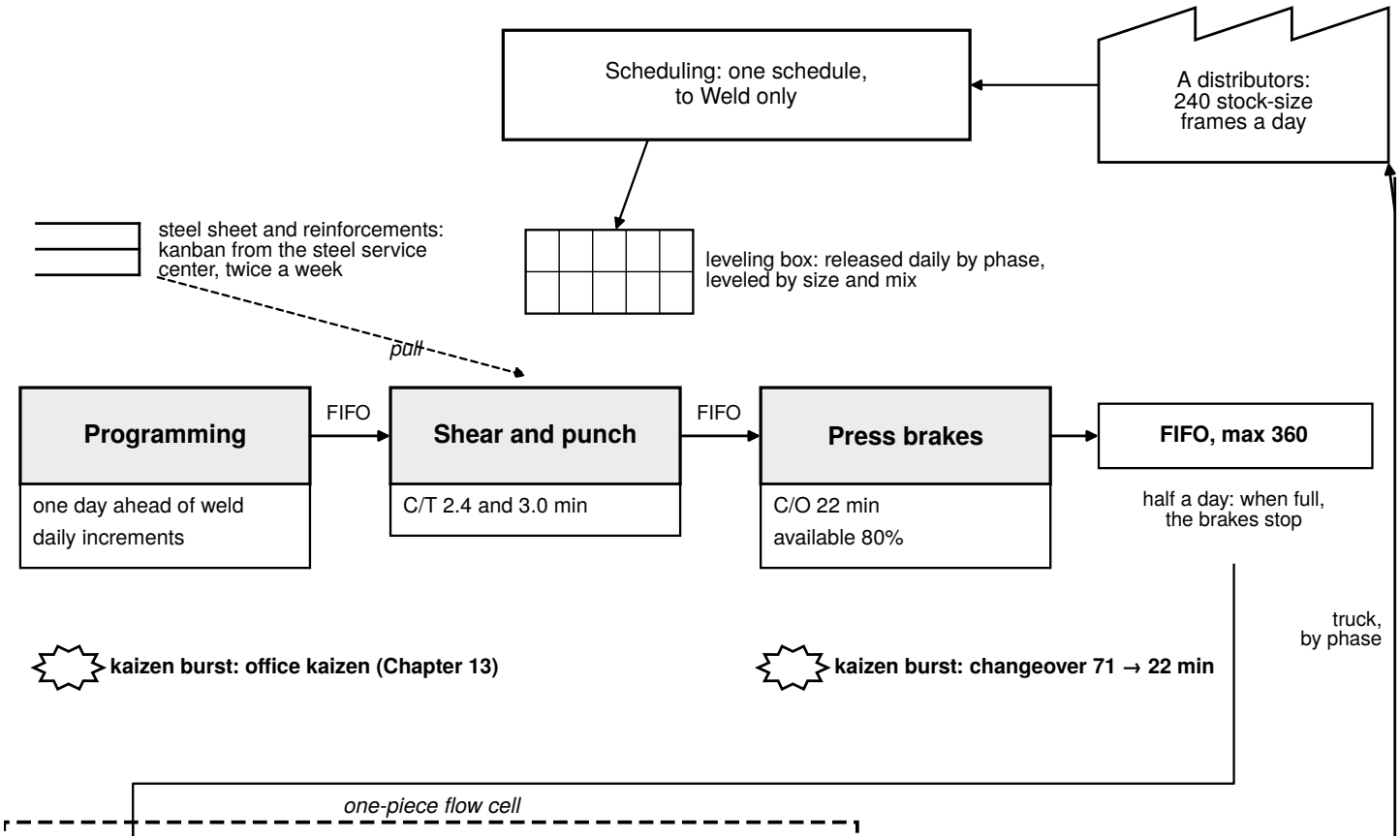
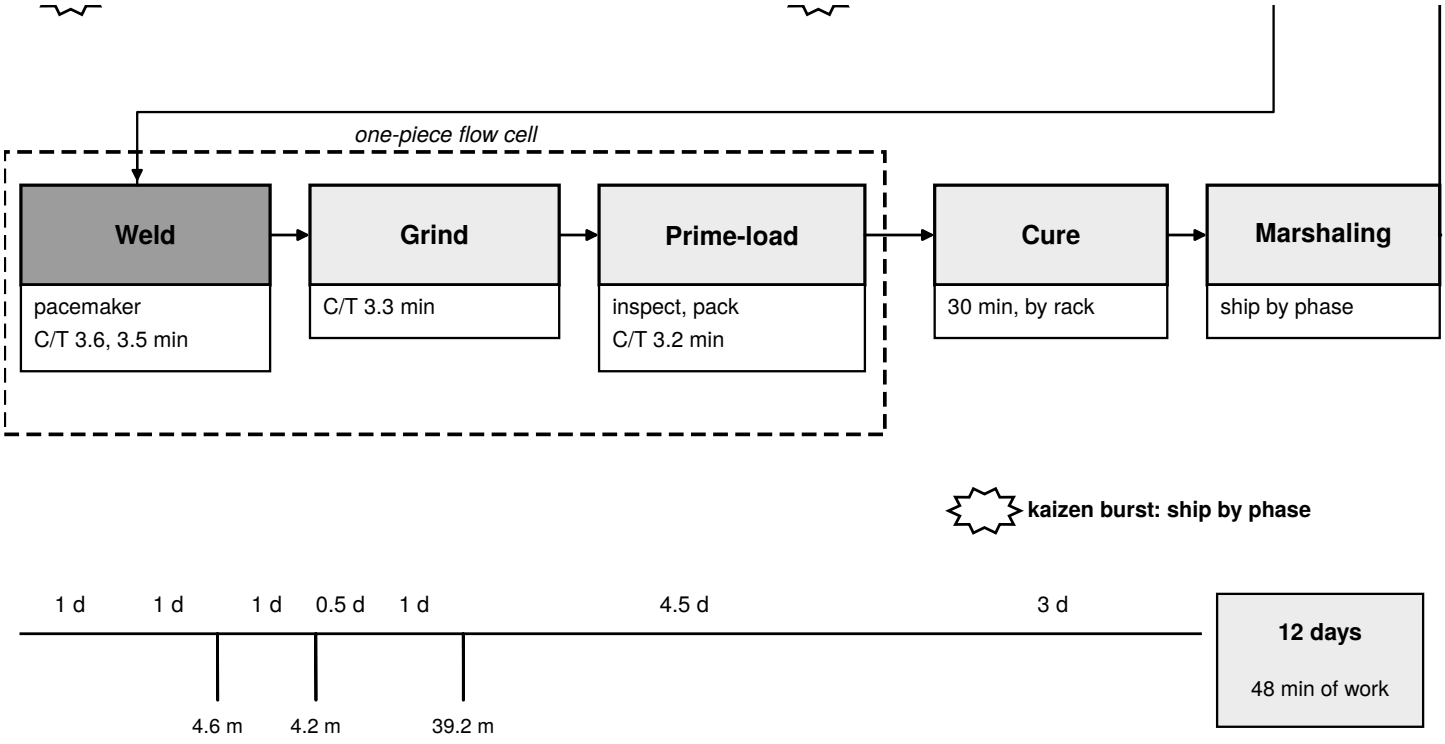


Figure 9.2 · Lower detail

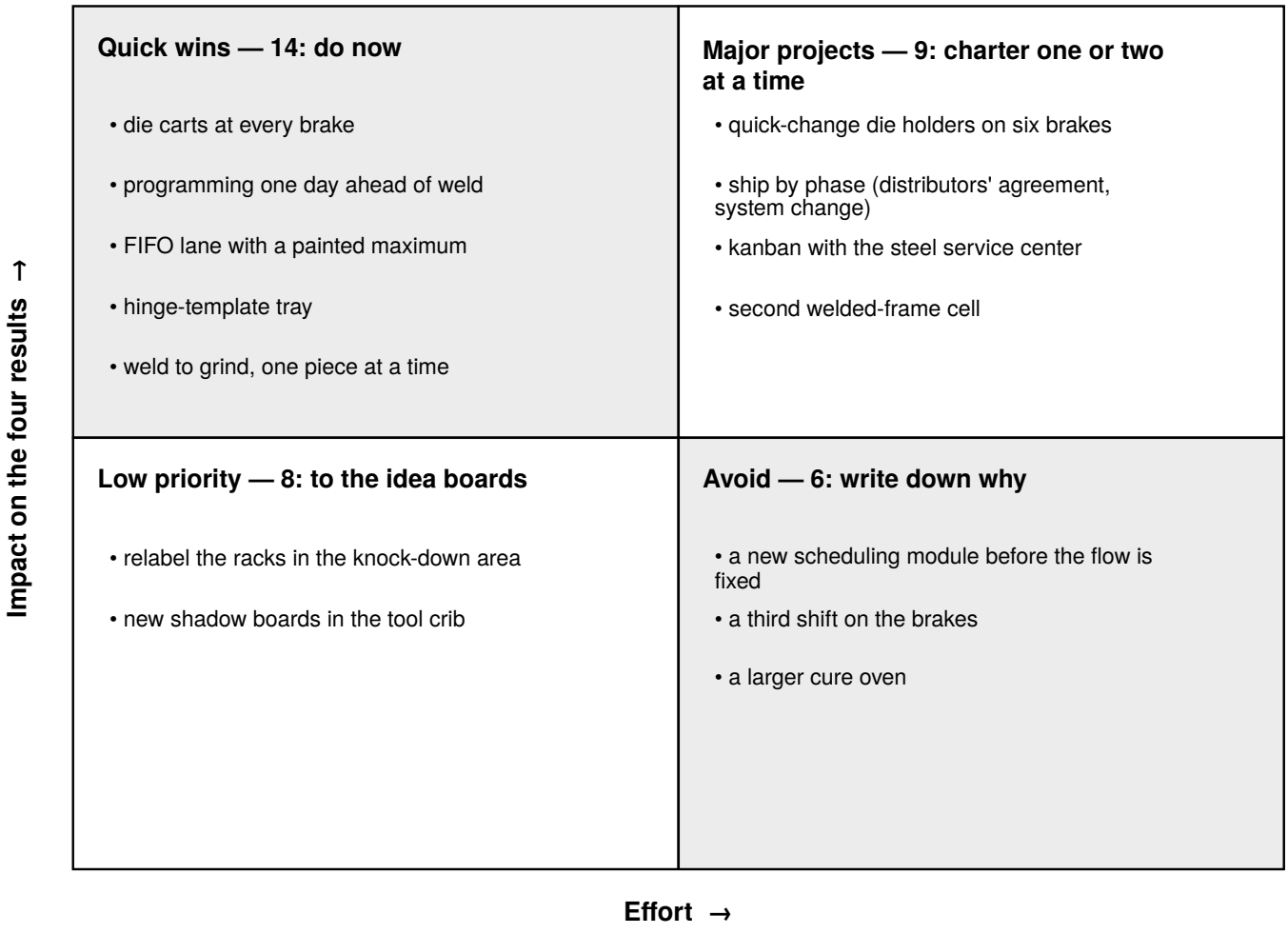
Enlarged original artwork. The complete map is on the preceding overview page.



The work per frame is unchanged at 48 minutes. The waiting fell from 42 working days to 12.

Figure 9.3 · Impact and effort, Brennick's thirty-seven ideas from the value stream map

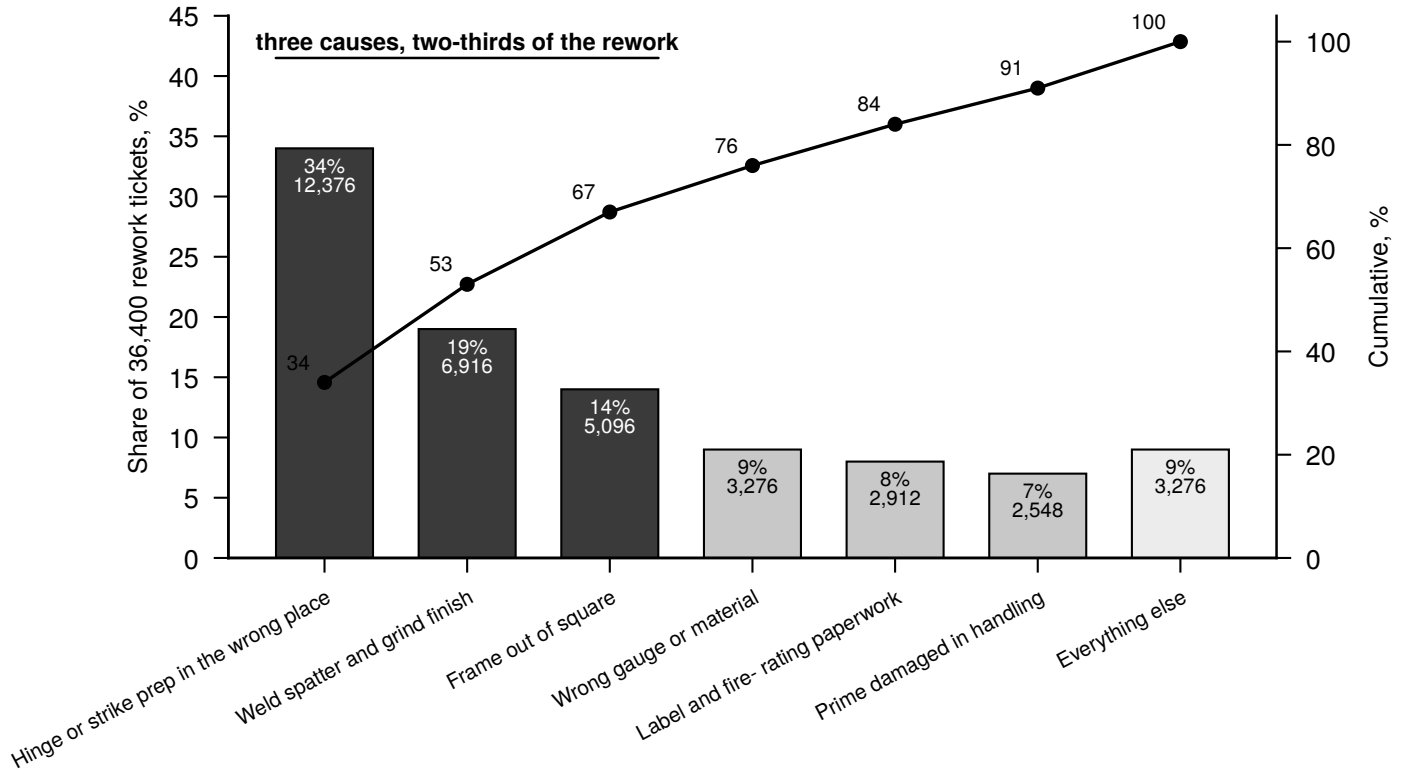
Chapter 9: Map the Flow | Source figure 09-03 | Book PDF page 103



Impact and effort: the thirty-seven ideas from Brennick's value stream map, sorted into quick wins, major projects, low priority and avoid.

Figure 10.1 · The Pareto of rework at Brennick, the twelve months before Day 1

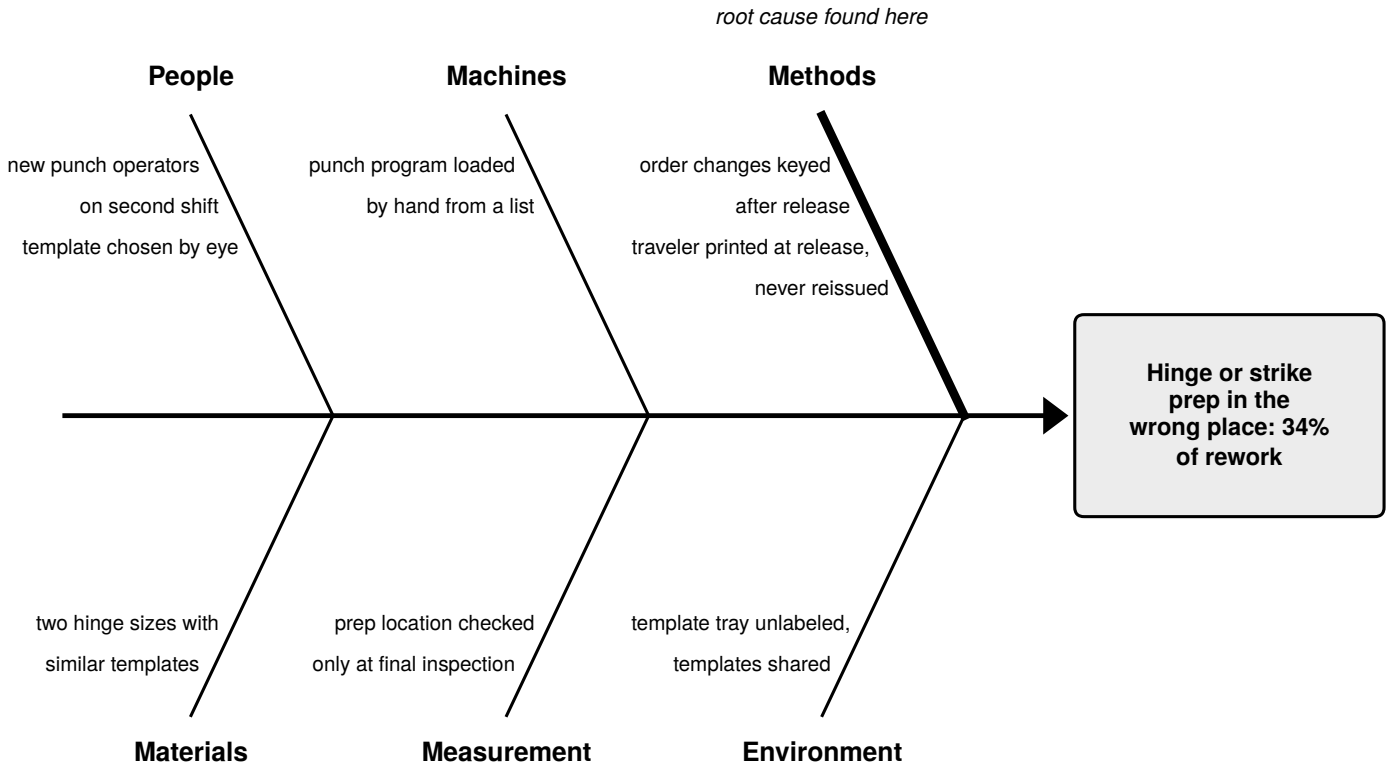
Chapter 10: Stop Problems at the Source | Source figure 10-01 | Book PDF page 108



The Pareto of rework at Brennick: three causes made two-thirds of 36,400 rework tickets.

Figure 10.2 · The fishbone for hinge preps in the wrong place, Brennick, Day 74

Chapter 10: Stop Problems at the Source | Source figure 10-02 | Book PDF page 111



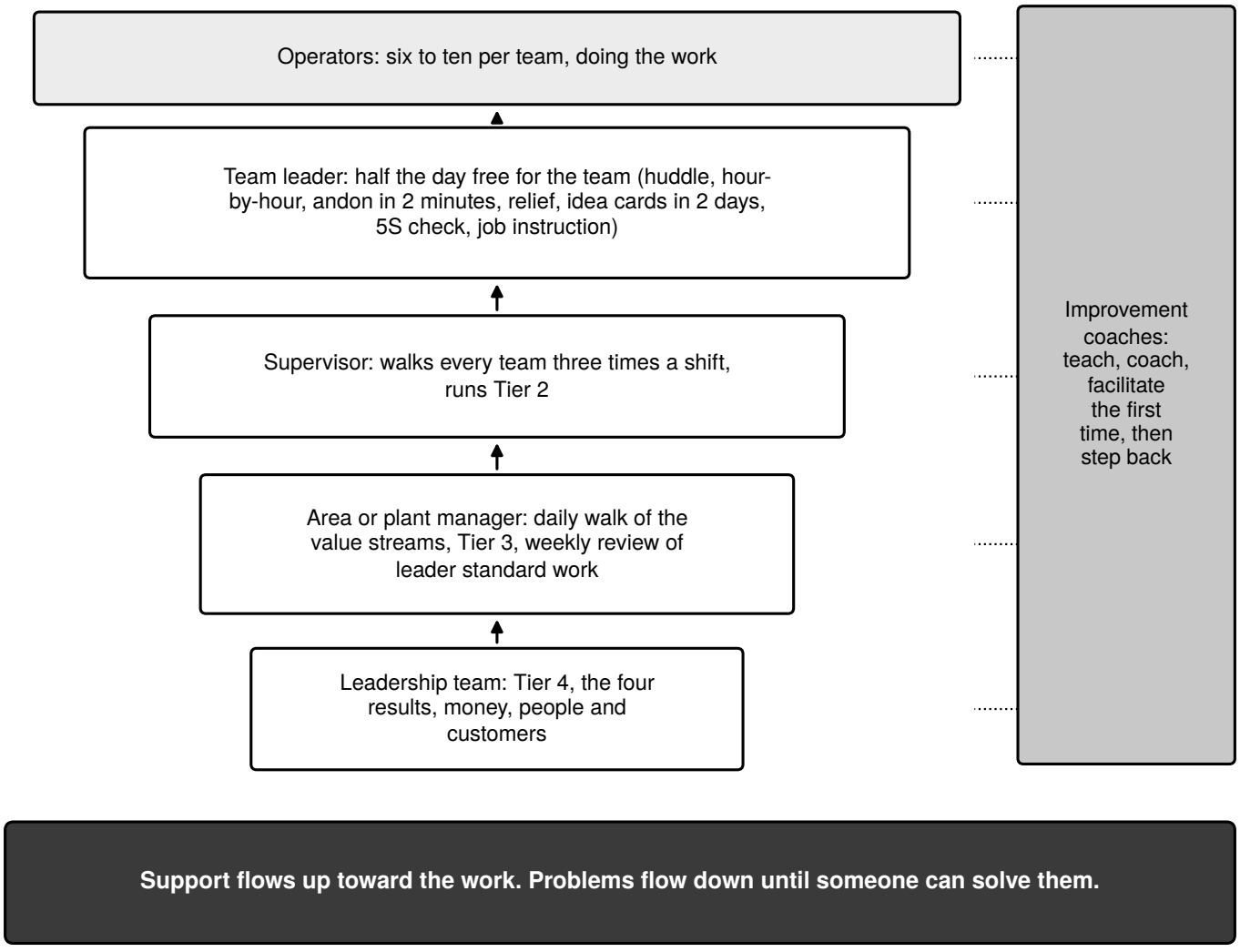
The methods bone, five whys

1. Why in the wrong place? The punch was set from the traveler drawing.
2. Why was the drawing wrong? The traveler showed revision B. The order was revision C.
3. Why didn't the floor have C? The order changed after release, and the traveler was never reissued.
4. Why could that happen? No release freeze. Nothing told the floor a released order had changed.

The fishbone for Brennick's largest cause of rework, with the five whys that found the root cause in the office.

Figure 11.1 · The team and its support chain

Chapter 11: Build the Team That Runs It | Source figure 11-01 | Book PDF page 119

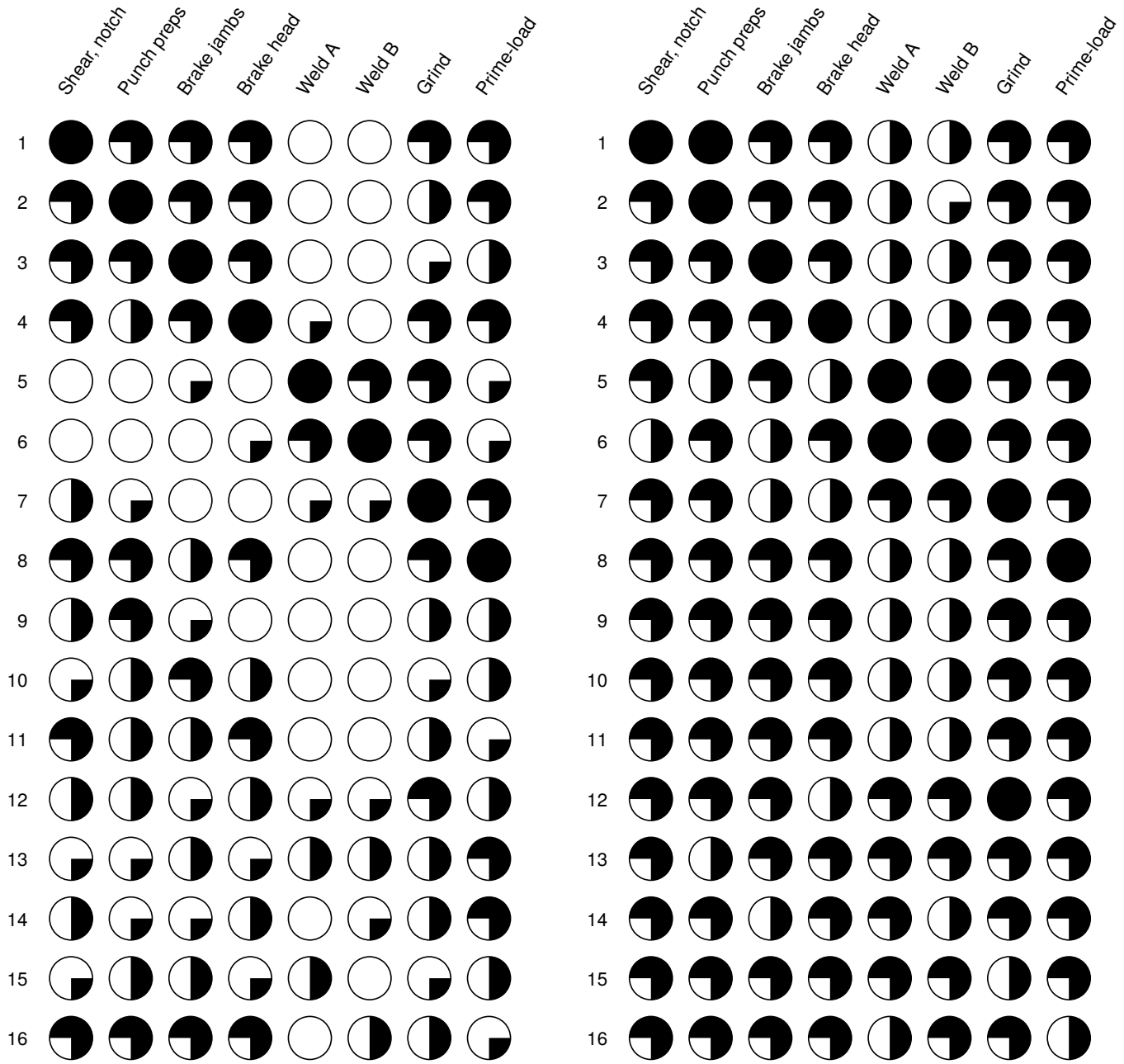


The team and its support chain, drawn with the work at the top: every level exists to help the level above it, and the coaches support every level without owning any.

Figure 11.2 · The skills matrix, Cell 1, Day 100 and Day 365

Chapter 11: Build the Team That Runs It | Source figure 11-02 | Book PDF page 121

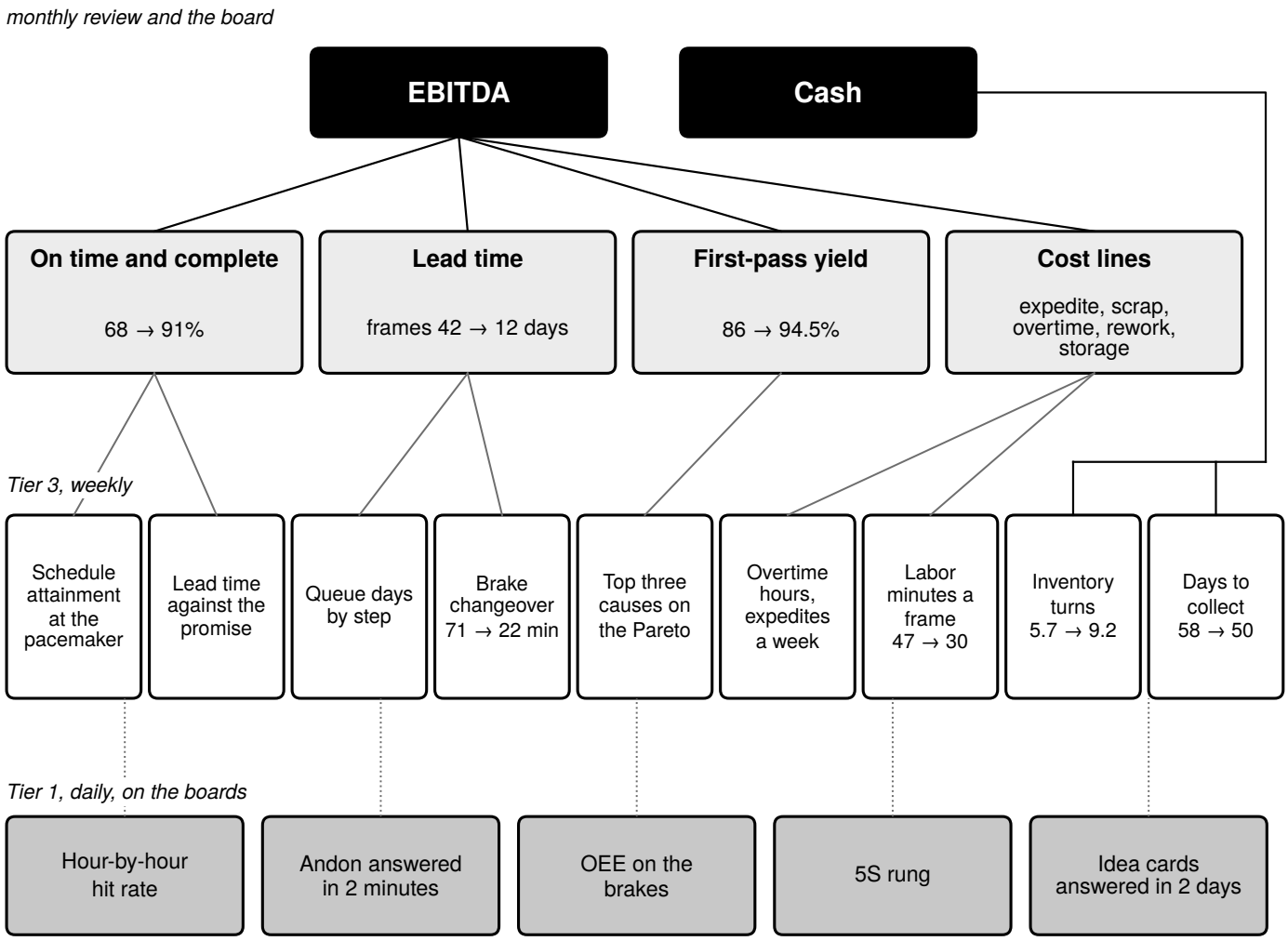
Quarters filled: 1 learning, 2 can do with help, 3 can do alone, 4 can teach. Operators numbered, names withheld.



The skills matrix on Cell 1 at Day 100 and Day 365: from a team that could cover its absences on a good day to one that covers them every day.

Figure 12.1 · The KPI tree at Brennick

Chapter 12: Count It in Results | Source figure 12-01 | Book PDF page 129

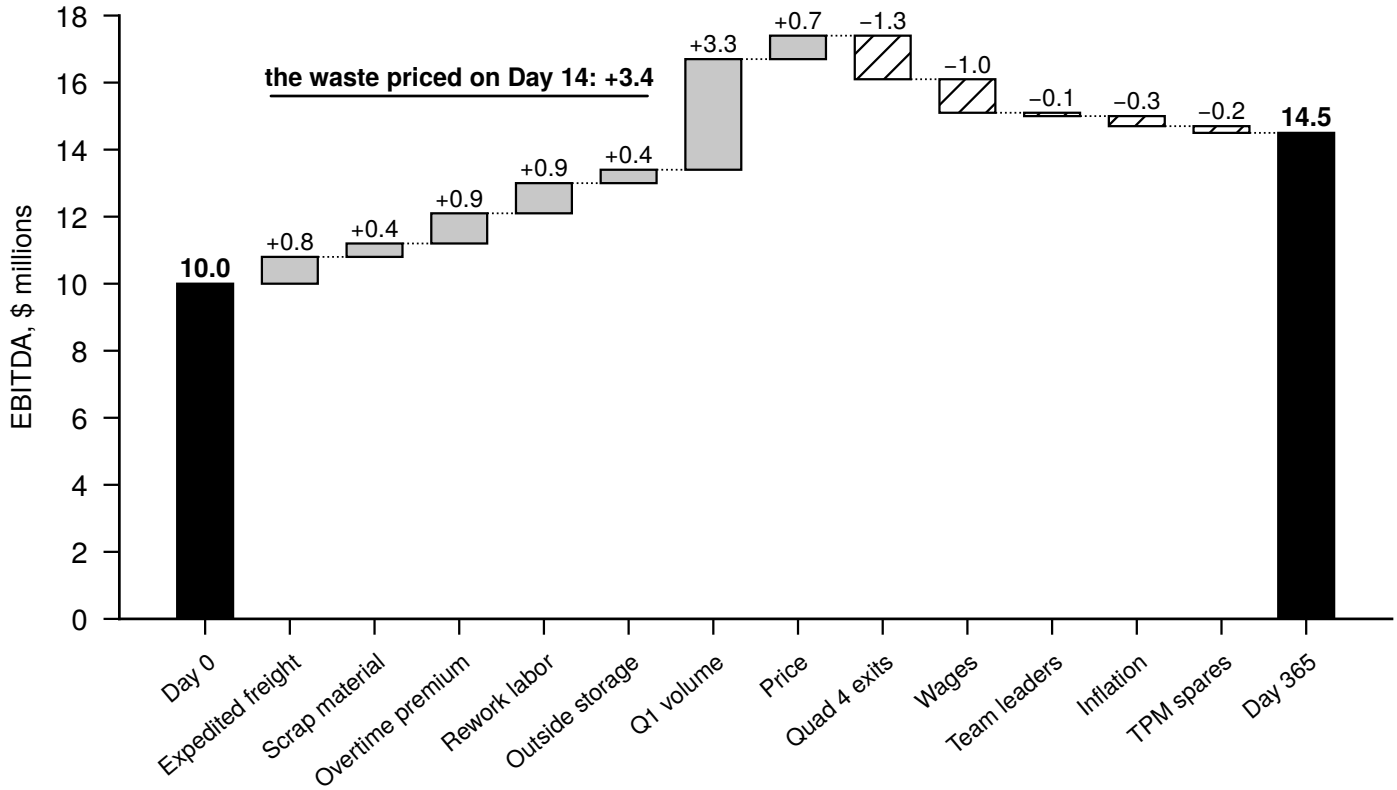


Every box has an owner and a frequency. Every number on the owner's page can be traced down to a team that can move it in a shift.

The KPI tree at Brennick, from EBITDA and cash at the top to the measures a team can move in a shift at the bottom, with the Day 0 and Day 365 values.

Figure 12.2 · The bridge, Day 0 to Day 365

Chapter 12: Count It in Results | Source figure 12-02 | Book PDF page 133

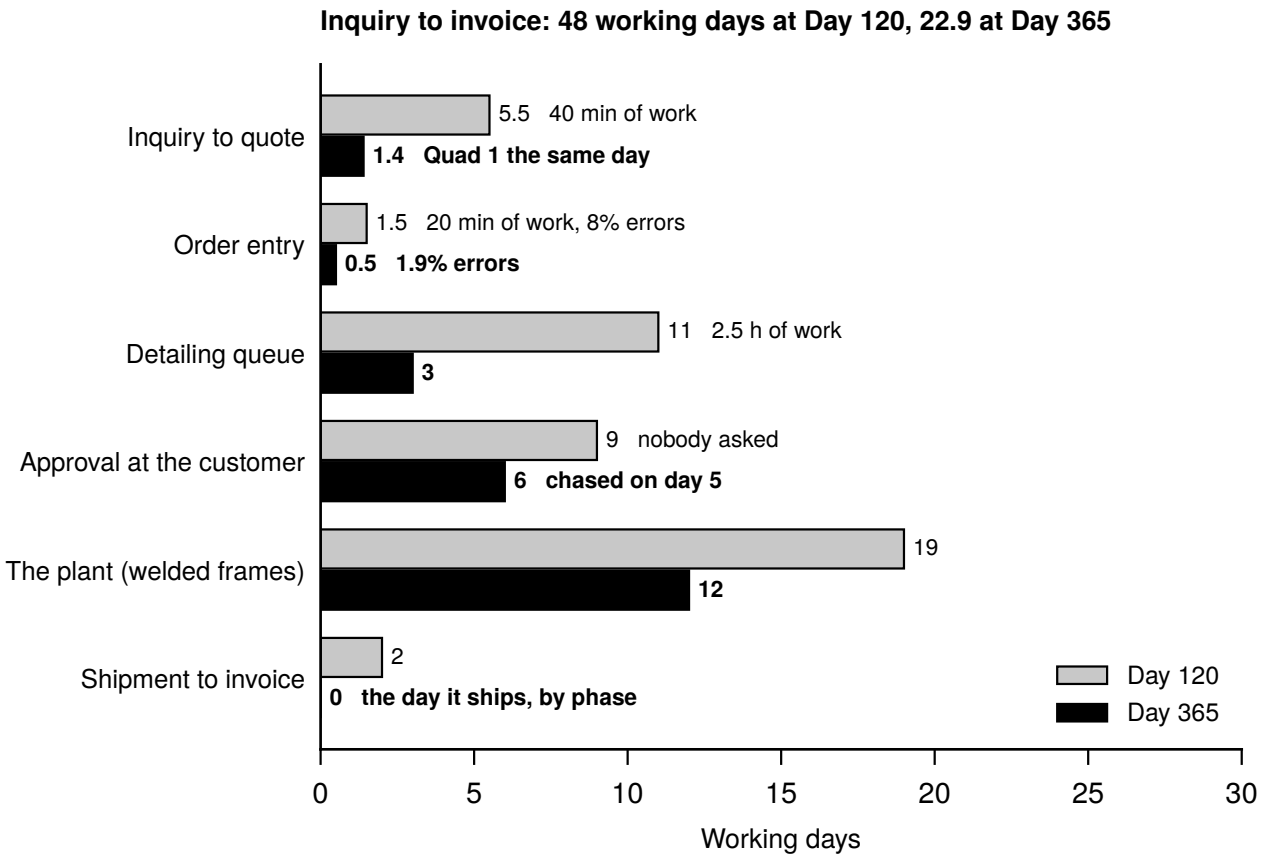


Run-rate at Day 365 ($108.2 million of revenue, 13.4 percent). Every line from the ledger, against the Day 0 baseline, signed by the chief financial officer. Cash released besides: inventory $5.1 million, receivables $1.7 million.

The bridge from $10.0 million to $14.5 million: twelve ledger lines, built and signed by finance, with the waste priced on Day 14 as its first five.

Figure 13.1 · Quote to cash at Brennick, Day 120 and Day 365

Chapter 13: Lean in the Office | Source figure 13-01 | Book PDF page 137



Then the cash: customers paid in 58 days at Day 120 and in 50 at Day 365, $1.7 million out of receivables against the Day 0 balance.

Quote to cash at Brennick, measured at Day 120 and again at Day 365: the office's queues, with the plant as one bar among them.

Figure 14.1 · The rhythm that lasts

Chapter 14: The Rhythm That Lasts | Source figure 14-01 | Book PDF page 145

Daily	• Machine care, 5 min — operators • Tier 1 at 6:05 and 14:35 — team leaders • Tier 2 at 6:30 — supervisors • Tier 3 at 7:30 — plant manager • Tier 4 at 8:30 — chief executive	• Hour-by-hour, every hour — team leaders • Walks on the posted schedule — every leader • Idea cards answered in 2 days — team leaders • 5S, 5 min at shift end — teams
Weekly	• Leader standard work reviewed, one level up • Action tracker at Tier 3 • No and not-yet cards read by supervisors	• Leadership team walk • Skills matrix brought up to date
Monthly	• Four results and the finance-signed bridge • 5S ladder checked by managers	• Town hall: the ledger and the best cards • Thirty-day follow-ups held on their dates
Quarterly	• Quad re-cut • Kaizen plan aimed by the Quad of the work	• Sustain audit • Hand count of every automated measure
Yearly	• New future-state maps, every Quad 1 stream • Targets reset from the A customers and the plan	• Improvement priorities beside the strategy • Day 365 review: lasted, faded, stop

Every routine two deep: an owner, and a second who has run it.

The rhythm that lasts: every routine in the book on one calendar, daily to yearly, with its owner.

Figure 14.2 · Brennick's page, Day 0, Day 365, Day 1,000

Chapter 14: The Rhythm That Lasts | Source figure 14-02 | Book PDF page 148

	Day 0	Day 365	Day 1,000
Recordable injury rate, per 200,000 hours	4.6	2.3	**1.4**
On time and complete	68%	91%	**96%**
Welded-frame lead time, working days	42	12	**9**
Door lead time, working days	47	19	**14**
First-pass yield	86%	94.5%	**97.1%**
Brake OEE	49%	64%	**71%**
Inventory turns	5.7	9.2	**11.4**
Revenue	$104.0M	$108.2M run-rate	**$121.0M**
EBITDA	$10.0M (9.6%)	$14.5M (13.4%)	**$17.0M (14.0%)**
Right to Grow ratio	1.78	1.94	**2.05**

Day 700: the coach left. Day 701, 6:05: the huddle started on the minute.

Brennick's page at Day 0, Day 365 and Day 1,000, the four results and the dollars, with the morning that proved the rhythm.

The masterclass and this book

How to Read This Book | T01

Masterclass lesson	Chapter	Field Guide worksheets
Introduction to Lean	1 — Aim Before You Improve	1–3
Lean Principles	2 — Value Is What the A Customer Pays For	4–6
The Eight Wastes	3 — Learn to See the Waste	7–9
Recognizing Waste in the Workplace (5S)	4 — Make the Workplace Speak	10–12
Kaizen	5 — Small Changes, Every Day	13–15
Standard Work, Part 1	6 — Write the Best Way Down	16–19
Standard Work, Part 2	7 — Go and See	20–23
Visual Management	8 — Make It Visible	24–27
Lean Tools, Parts 1 and 2	9 — Map the Flow, and 10 — Stop Problems at the Source	28–34
Teamwork and Collaboration	11 — Build the Team That Runs It	35–36
Lean Metrics and KPIs	12 — Count It in Results	37–38
Beyond the masterclass	13 — Lean in the Office, and 14 — The Rhythm That Lasts	39–40

What to read and produce at each stage

How to Read This Book | T02

When	Read	Produce
The week you commit	How to Read This Book, 1	The Quad of the work, the model line, the four results with today's numbers, the commitment in writing
Days 1 to 30	2, 3, 4, 9	Interviews with the A customers, the order timeline, the waste walk priced, the current-state map
Days 31 to 100	5, 6, 7, 8	5S on the model line, the first kaizen week and its follow-up, the idea board, takt and standard work, leader standard work, the hour-by-hour board, the andon, the first changeover workshop
Days 101 to 365	10, 11, 12, 13	The future state built, with its pacemaker, A3s on the top causes, team leaders and the skills matrix, the KPI tree and the bridge, the office mapped
Year 2 and after	14	The rhythm calendar, every routine two deep, the sustain audit, the Quad re-cut

The Instruments — chapter and worksheet reference

The Instruments | T11

Chapter	Instrument	Worksheet
1	The Quad of the work	1
1	The four fades — where the last program faded	2
1	The model line, the four results and the commitment	3
2	The A customer interview	4
2	The value-add test	5
2	The order timeline — lead time against work time	6
3	The waste walk	7
3	Price the waste	8
3	Mura and muri	9
4	The red-tag log	10
4	The 5S ladder	11
4	The area standard and the five minutes	12
5	The PDCA card and the idea board	13
5	The kaizen week — charter and report-out	14
5	The thirty-day follow-up	15
6	Takt and the time study	16
6	The line balance	17
6	Standard work — the combination sheet and the chart	18
6	The job instruction breakdown	19
7	The gemba walk card	20
7	Leader standard work	21
7	The spaghetti diagram and the batch arithmetic	22
7	The control chart	23
8	The hour-by-hour board	24
8	The andon ladder	25

The Instruments — chapter and worksheet reference

The Instruments | T11

Chapter	Instrument	Worksheet
8	OEE and the changeover	26
8	The tiered huddle board	27
9	The current-state map	28
9	The future-state map and the kanban loop	29
9	Impact, effort and the action tracker	30
10	The Pareto	31
10	The fishbone and the five whys	32
10	The A3	33
10	The mistake-proofing plan	34
11	The team charter and the skills matrix	35
11	The idea system, recognition and the ledger	36
12	The KPI tree	37
12	The scorecard and the finance-signed bridge, against the Day 0 baseline	38
13	Quote to cash — the office map and standard work	39
14	The rhythm calendar and the sustain audit	40

Continue the Work — where to start

Continue the Work | T12

Your situation	Start here
The model line starts Monday and the old tape is still on the floor	This book, and the Field Guide beside it
You need to know where the money is before you aim anything	The 80/20 Company
The plan is written and what you lack is the rhythm to deliver it	The Strategy Deployment Process
The board expects a strategy and all you hold is a target and a deadline	The Strategy Management Process
The tail is priced below what it costs to serve	Get Paid
You sell for a living, or you lead the people who do	The 80/20 Salesman
You have just become CEO and the first hundred days are in front of you	Take Control (The 1000-Day CEO, Book One)
You want the engine underneath all of it	The 80/20 CEO
A fable first, then the method	The Art of Making Honey

Put It to Work · Start with the first meeting

Exact main-book extract: PDF page 151. Full Field Guide sold separately.

Put It to Work

Pages from The Field Guide

Brennick's story ends on Day 1,000, with every result still improving and the coach long gone. Yours starts where Brennick's did: a plant that has watched one program fade, and a blank page.

Use these pages to settle the first decisions in writing, before anyone tapes a floor. Take them into a room with your plant manager, your chief financial officer, your coach and the leader of the line you think should go first. Work from your own ledger and your own floor. Write down what you're sure of, mark what you aren't, and assign every gap to someone, with a date.

Start with the Quad of the work, even if you're sure you know where the work goes. Brennick's last program started where a foreman volunteered, in a corner that earned 1.4 percent of the revenue.

These pages are a start. *Lean That Lasts · The Field Guide*, sold separately, has all forty worksheets with Brennick's version beside each blank, plus Day Zero, the first hundred days, the review masters and a guide for the coach. The Instruments page that follows lists them by chapter.

What the first meeting must put on paper

1. The Quad of the work, tied to the books, with a name and a date on the Quad 4 simplify list.
2. A model line in Quad 1 that passes all five tests, with an owner, a leader and a coach who owns nothing.
3. The four results as of today, signed by finance, and the commitment written word for word, with the day both shifts will hear it.

Do the work by hand or use the tools you have. Tie every number to the ledger, the stopwatch or the floor before it drives a decision. The person who owns the result makes the call.

Thinking is required.

Put It to Work · The program on one page

Exact main-book extract: PDF page 152. Full Field Guide sold separately.

The program on one page

The parts overlap, and each number below is its chapter. The order is the order in which the work starts, not the order in which it ends.

Part One · See the Work

1. **Aim Before You Improve.** The Quad of the work, the last program's four fades, the model line, the four results and the commitment.
2. **Value Is What the A Customer Pays For.** A customer interviews, the value-add test, one order followed to the truck.
3. **Learn to See the Waste.** The waste walk, and the eight wastes priced in the ledger.
4. **Make the Workplace Speak.** 5S on the model line, held by five minutes a shift.

Part Two · Improve the Work

5. **Small Changes, Every Day.** PDCA at the line, ideas answered in two days, the kaizen week and its follow-up.
6. **Write the Best Way Down.** Takt, the time study, the line balance, standard work and job instruction.
7. **Go and See.** Leader standard work at every level, and a walk on a posted schedule.

Part Three · Run the Work

8. **Make It Visible.** The hour-by-hour board, the andon, the changeover cut and the tiered huddles.
9. **Map the Flow.** The value stream as it is and as it will be, and the kanban loop.
10. **Stop Problems at the Source.** The Pareto, the five whys, the A3 and mistake-proofing.

Part Four · Make It Last

11. **Build the Team That Runs It.** Working team leaders, the idea system and the ledger of people moved.
12. **Count It in Results.** The KPI tree, the scorecard and the bridge finance signs.
13. **Lean in the Office.** Quote to cash, run by the plant's rules.
14. **The Rhythm That Lasts.** The calendar two people deep, the sustain audit and the yearly re-aim.

Put It to Work · The first thirty days

Exact main-book extract: PDF page 153. Full Field Guide sold separately.

The first thirty days

This month aims the program, prices the waste and makes the promise before anything on the floor changes. If the counts take longer, slip the dates, and write down who owns the slip.

Days 1 to 7: read the last program and start the counts. Hold the first leadership session. Read the results you have out loud, name the four fades of the last program, and draft the commitment. Assign the counts: revenue by customer and by product, and four things your people call the hard part of the day. Start sorting every rework ticket by cause.

Done / still open: _____

Owner / due by: _____

Days 8 to 14: put numbers on the work. Finance draws the Quad of the work. Follow one order of your best seller from release to the truck, and count both the working days and the minutes of work. Sit with your best A customer and ask what they pay you for. Walk the value stream for ninety minutes with the people who run it, then price what the walk found in the ledger.

Done / still open: _____

Owner / due by: _____

Days 15 to 30: aim, promise and map. Choose the model line in Quad 1 and post the four results beside it. Read the commitment to both shifts, the off shift brought in early and paid for the time. Post your walk schedule and hire or name the coach. Map the model line's value stream as it runs today. Answer every idea the last program left open: yes, no, or not yet and why.

Done / still open: _____

Owner / due by: _____

On Day 30, meet again. Bring the Quad of the work, the followed order, the waste priced and signed, the model line with its four results, the current-state map and the answers to the old ideas, and set the dates for the 5S week and the first kaizen week. Brennick drew its Quad on Day 9 and priced its waste on Day 14. I read the commitment to both shifts on Day 15, Tunde Adeyemi started as coach on Day 20, and all 168 ideas from the old binder had an answer by Day 30. Use these dates to plan. Don't use them to skip a count.

First kaizen week, dates and owner: _____

Put It to Work · A. The Quad of the work

Exact main-book extract: PDF page 154. Full Field Guide sold separately.

A. The Quad of the work

Twelve months of invoice lines split into the four Quads, then four counts of the hard work set beside the revenue. Finance draws the Quad, and each count's owner brings the count. Quad 1 is A customers and A products, Quad 4 is B customers and B products, and Quads 2 and 3 are the mixes.

Twelve months, from and to: _____

Counts 1 to 4: _____

Percent of each	Revenue	Count 1	Count 2	Count 3	Count 4
Quad 1					
Quad 2					
Quad 3					
Quad 4					
Total	100	100	100	100	100

Carol Abernathy and her analyst drew Brennick's by Day 9: $104.0 million split $63.4 million, $19.8 million, $13.5 million and $7.3 million across the four Quads. The counts were brake changeovers, detailing hours, rework tickets and expedited shipments. Quad 4 earned 7 percent of the revenue and took 36, 38, 31 and 35 percent of the four counts. Quad 1 earned 61 percent and never took more than 31 percent of any of them.

Improve where the money is, and simplify where the work is. Quad 1 gets the model line. Quad 4 gets a simplify list with an owner and a date, and no Lean work until each stream has its decision.

Full Field Guide: Worksheet 1, with the last program's four fades in Worksheet 2.

Put It to Work · B. Price the waste

Exact main-book extract: PDF page 155. Full Field Guide sold separately.

B. Price the waste

Put each waste in the ledger line where it already lives, with twelve months of actual dollars, not a savings estimate. The waste walk's cards say which lines to pull. Finance builds the page from the books, and the chief financial officer signs it.

Walk date, and the walkers: _____

Ledger line	The wastes that live there	Twelve months, actual
Total		

EBITDA for the same twelve months: _____

Signed by the chief financial officer, and posted where: _____

Brennick's walk took ninety minutes and filled 112 cards. Carol Abernathy built the page on Day 14 and signed it: expedited freight $1.2 million, scrapped material $0.9 million, overtime premium $1.5 million, rework labor $1.7 million and outside warehouse rent $0.5 million, $5.8 million in all, or 58 cents of waste for every dollar of the $10.0 million of EBITDA. The $13.7 million of inventory was shown beside the sum, not added to it. By Day 365 the same five lines were worth $3.4 million on the bridge.

Price only what the ledger can support. Late orders, lost share and unused talent are real, but they stay off this page, so nobody can argue with what is on it.

Full Field Guide: Worksheets 7 and 8.

Put It to Work · C. The model line, results and commitment

Exact main-book extract: PDF page 156. Full Field Guide sold separately.

C. The model line, the four results and the commitment

One line, four numbers and one promise, all written down before the first kaizen week.

The line or cell, with its owner, leader and coach: _____

The model line passes all five tests	Yes or no
Quad 1: an A product, bought by A customers	
Seen: people pass it every day	
Wanted: its leader asked when, not why	
Measurable: a result inside a hundred days	
Contained: one value stream, start to finish	

The four results	Today	Target, and by when
On time and complete, to the promise		
Lead time, release to ship, working days		
First-pass yield		
EBITDA, and the lines it will move		

Signed by the chief financial officer, date: _____

The commitment, word for word, and the day both shifts hear it: ___

Brennick's was Cell 1: stock welded frames for the A distributors, 240 a day on two shifts, beside the main aisle. Ruth Treadwell owned it, Luz Avila led it, and Tunde Adeyemi coached it. On Day 15, at a town hall with both shifts, the four results went up on a whiteboard: 68 percent, 42 working days, 86 percent and $10.0 million of EBITDA. Then I read the commitment: "Nobody at Brennick will lose a job because of an improvement. If we find a better way and it frees a person, that person gets better work." By Day 100 Cell 1 shipped frames in 21 working days, and six people had moved to named jobs.

Say what it doesn't promise, too. It doesn't rule out a layoff for some other reason, and saying so makes the rest believable.

Full Field Guide: Worksheet 3, with Day Zero before it.

Put It to Work · D. The hour-by-hour board and huddles

Exact main-book extract: PDF page 157. Full Field Guide sold separately.

D. The hour-by-hour board and the huddles

Every hour of the shift gets a row: the plan, what was made, the gap, why, and what was done about it. Each hour plans its working minutes divided by takt, so an hour that holds the huddle or a break plans fewer.

Cell, shift, date and team leader: _____

Takt, in minutes a unit: _____

Hour	Plan	Actual	Gap	Reason for a miss	Action, and who

Tier and board	Time	Who stands there
1. Each team's board		
2. The area board		
3. The plant board		
4. The leadership board		

Cell 1's board went up on Day 60: sixteen frames an hour at a takt of 3.75 minutes. In its first week the cell made its hour 57 percent of the time, and the reasons kept repeating: heads late from the brake, no hinge-prep template at the punch. By Day 100 it made its hour 84 percent of the time. The huddles ran on a clock, at 6:05, 6:30, 7:30 and 8:30, so a problem raised at the line was answered before first shift's lunch.

Fill it in by hand, every hour. A team leader who writes the same reason three hours running fixes it before the fourth.

Full Field Guide: Worksheets 24 and 27.

Put It to Work · E. The page finance signs and the calendar

Exact main-book extract: PDF page 158. Full Field Guide sold separately.

E. The page finance signs, and the calendar that keeps it

Every month the four results go on one page, safety first, with the bridge from Day 0 beneath them. The chief financial officer builds it from the ledger, signs it and presents it. The improvement team never does.

Bridge line, from the ledger	Day 0	Now	Effect on EBITDA
Day 0 EBITDA			

Run-rate EBITDA, a full quarter

Routine	Owner	Second, who has run it
The huddles		
The hour-by-hour board		
The idea board		
The monthly review		

Signed by the chief financial officer, date: _____

Carol Abernathy signed Brennick's Day 365 page from the fourth quarter's run-rate. EBITDA went from $10.0 million to $14.5 million: $3.4 million from the five waste lines, $3.3 million from the A distributors' added work and $0.7 million from price, less $1.3 million of Quad 4 exits, $1.0 million of wage increase and $0.6 million of smaller costs, every line from the ledger. The calendar named a second for every routine, so when the coach left on Day 700, the huddle started on the minute the next morning.

Count every dollar once, on the ledger line where it lands. Hours freed stay off the bridge until they earn revenue or remove a cost.

Full Field Guide: Worksheets 37, 38 and 40.

Glossary · 1 of 7

Exact approved main-book reference extract: PDF page 163.

Glossary

The terms this book uses, in the sense it uses them. Each entry names the chapter where the term does its main work. Entries beginning with a number come before the letters.

5S. Five steps that make a workplace show normal and abnormal at a glance: sort, set in order, shine, standardize, sustain. The foundation for every other tool, started on the model line and held by the team leader's daily check. Chapter 4.

5S ladder. The five steps by five rungs (not started, first pass, standard in place, sustained three months, improved by the team), checked weekly by the team leader and posted beside the area's on-time number. It replaces the monthly 5S score. Chapter 4.

80/20 principle. The pattern Vilfredo Pareto found, that a small share of causes accounts for most of an effect. Applied here to customers, products, work and problems. Chapter 1.

A customer, A product. Rank customers by twelve months of revenue. Those that together make the first 80 percent are the A customers, about a fifth of them. The same rule for products. Everyone and everything else is a B. Chapter 1.

A3. A problem worked on one side of one sheet of A3 paper, about eleven by seventeen inches: background, current condition, goal, root cause, countermeasures, plan, follow-up. Written in pencil by the problem's owner, with a coach. Chapter 10.

AI (artificial intelligence). The tools that pull, count, sort, match and redraw in hours what once took weeks, held to four rules: tie it to its source, do the first one by hand, protect the data, let the owner decide. Never a substitute for standing in the place. How to Read This Book.

Andon. A signal (a cord, a button, a light) an operator uses to call for help, and the written response ladder that answers it: team leader in two minutes, supervisor in ten, area manager in thirty. Measured by response, not by pulls. Chapter 8.

Glossary · 2 of 7

Exact approved main-book reference extract: PDF page 164.

Available time. Scheduled time less breaks, the start-of-shift huddle and the five minutes of 5S. Not less breakdowns or changeovers, which are problems to fix. The numerator of takt. Chapter 6.

Batch arithmetic. Ten pieces through three one-minute steps: last piece done at minute thirty in a batch, minute twelve one piece at a time. Chapter 7.

Bridge, the Lean. The monthly reconciliation of what the program did to EBITDA and cash, built by finance from the ledger against the Day 0 baseline, signed by the chief financial officer. No hours, no avoided costs, no annualized months. Chapter 12.

Changeover. The time a machine is stopped between the last good part of one run and the first good part of the next. Cut with SMED. Chapter 8.

Commitment, the. Nobody loses a job because of an improvement. People an improvement frees move to named work, the same week, at the same pay or better. It does not promise that nobody is ever laid off for any reason. Chapters 1 and 11.

Common cause, special cause. Variation that comes from many small causes all the time, and is part of how the process runs, against variation from one specific cause that just appeared. React only to the second. Chapter 7.

Control chart. A measurement plotted in time order with a center line and control limits calculated from the data. A point outside the limits, or seven in a row on one side, is a signal. Everything else is the process being itself. Chapter 7.

Cycle time. How long one operator takes to complete their work on one unit before starting the next. Timed over ten cycles, the lowest time repeated without strain. Chapter 6.

Definition of complete. What a piece of office work must contain before the next desk accepts it. The rule that removes most of the office's loops. Chapter 13.

DMAIC. Define, measure, analyze, improve, control: the problem-solving sequence of Six Sigma programs. A cousin of PDCA and the A3. Chapter 10.

DOWNTIME. The masterclass's mnemonic for the eight wastes: defects, overproduction, waiting, non-utilized talent, transportation, inventory, motion, extra-processing. Chapter 3.

EBITDA. Earnings before interest, taxes, depreciation and amortization. What is left of material margin after total employee cost and other costs. The owner's result. Chapter 12.

Glossary · 3 of 7

Exact approved main-book reference extract: PDF page 165.

FIFO lane. A first-in, first-out lane between two processes, painted on the floor with a fixed maximum. When it is full, the upstream process stops making. Chapters 5 and 9.

First-pass yield. Of the units that reach final inspection, the share that pass the first time, with no rework. One of the four results. At Brennick, 86 percent at Day 0, 94.5 at Day 365. Chapter 10.

Fishbone. A diagram with the defect at the head and the categories of cause on the bones (people, machines, methods, materials, measurement, environment), drawn at the gemba to get every theory onto one page. Also called an Ishikawa diagram. Chapter 10.

Five whys. Asking why until the answer is a cause in the process that can be changed. Never stops at a person. Chapter 10.

Four fades, four antidotes. Lean fades when it is aimed at everything, run as events, owned by a department and counted in activity. It lasts when it is aimed with 80/20, run every day, owned by the line and counted in results. Chapter 1.

Four results. What the program is counted in: on time and complete, lead time, first-pass yield, and dollars (EBITDA and cash), signed by finance. Chapters 1 and 12.

Future-state map. The value stream redesigned around takt, flow, pull, one pacemaker and a level schedule, for a date six to twelve months out, with a kaizen burst at every gap. Chapter 9.

Gemba, gemba walk. The real place, where the work is done. The leader's walk there, on a posted schedule, to see and to help: never unannounced, never a gotcha, never argue or scold, and stop anything unsafe on the spot. Chapter 7.

Heijunka (leveling). Smoothing the volume and the mix of work released to the pacemaker, through a leveling box. It ends the end-of-month surge. Chapter 9.

Hour-by-hour board. At each cell, every hour: plan, actual, gap, the reason for any miss and the action taken, written by the team leader by hand. Chapter 8.

Idea board. The daily kaizen's board: new, answered, being done, done. Every card answered in two working days. Chapters 5 and 11.

Jidoka. Building quality in by stopping the work, or letting the machine stop itself, when something goes wrong. From Sakichi Toyoda's loom. One of the two pillars of the Toyota Production System. Chapter 10.

Job instruction. The Training Within Industry method for teaching work: prepare the person, present the operation, try out performance,

Glossary · 4 of 7

Exact approved main-book reference extract: PDF page 166.

follow up. Taught from the job instruction breakdown: major steps, key points, reasons. Chapter 6.

Just in time. Making only what is needed, when it is needed, in the amount needed. The result of flow and pull. Chapter 9.

Kaizen. Change for the better. Mostly small and daily, by the people who do the work, on the PDCA cycle. Chapter 5.

Kaizen burst. A starburst on a future-state map marking an improvement the future state needs. Chapter 9.

Kaizen newspaper. The action list a kaizen team leaves beside the area: every open action, its owner, its date. Closed at the thirty-day follow-up. Chapter 5.

Kaizen week. A team of six to eight spending a week on one chartered problem in a Quad 1 value stream, reporting out on the floor and following up at thirty days. A booster, never the program. Chapter 5.

Kanban. A signal (card, empty bin, empty square) that authorizes making or moving exactly what was used. No signal, no making. Chapters 8 and 9.

KPI tree. The measures that connect EBITDA and cash, through the four results and their drivers, to measures a team can change in a shift, each box with an owner and a frequency. Chapter 12.

Lead time. Working days from the moment an order can start to the moment it ships complete. At Brennick, forty-two days for a welded frame at Day 0, twelve at Day 365. Chapters 2 and 9.

Leader standard work. A written daily routine for each level of leadership, from team leader to chief executive, reviewed weekly at the gemba one level up. Chapter 7.

Line balance. Each station's cycle time stacked against takt. Bars above the line are bottlenecks, bars far below are waiting. Also called a yamazumi. Chapter 6.

Material margin. Revenue less purchased material and freight. Chapter 12.

Model line. The one Quad 1 line where the program is made to work completely before it spreads: visible, wanted by its leader, measurable in a hundred days, contained. Not a pilot. Chapter 1.

Muda, mura, muri. Waste, unevenness and overburden. Mura creates muri, and muri creates muda. Chapter 3.

OEE (overall equipment effectiveness). Availability times performance times quality: the share of scheduled time a machine spends making good parts at its rated speed. Measure it on the constraint first. Chapter 8.

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On time and complete. The share of orders shipped complete on or before the date promised, measured against the promise. One of the four results. Chapter 1.

Pacemaker. The single point in a value stream that is scheduled. Everything after it flows, everything before it is pulled. Chapter 9.

Pareto chart. Causes as descending bars with a cumulative line. Usually two or three causes make most of the trouble. Chapter 10.

PDCA. Plan, do, check, act. The cycle every improvement runs on, with a written prediction at its center. Chapter 5.

Poka-yoke (mistake-proofing). A device or design that keeps a mistake from becoming a defect: prevention first, detection second, inspection last. Shigeo Shingo's term. Chapter 10.

Pull. A later process takes what it needs, and the earlier process makes only what was taken. Chapter 9.

Quad, the. A and B customers laid against A and B products: Quad 1 (A customers, A products), Quad 2 (A customers, B products), Quad 3 (B customers, A products), Quad 4 (B customers, B products). *The 80/20 Company* teaches it at full depth. Chapter 1.

Quad of the work. Each Quad's share of revenue set beside its share of the hard work: changeovers, engineering hours, rework, expedites. It decides where improvement goes first. Chapter 1.

Queue board. The office's hour-by-hour board: at each desk, how many items are waiting and how old the oldest is, updated twice a day. Chapter 13.

Quote to cash. The office's value stream, from the first inquiry to the cash in the bank, with the plant as one box in the middle. Chapter 13.

Red tag. The tag on anything not used in ninety days, with a thirty-day clock and four dispositions: scrap, sell, send to where it's used, or keep with a home and a reason. Chapter 4.

Right to Grow ratio. Material margin as a multiple of total employee cost. At Brennick, 1.78 at Day 0, 1.94 at Day 365, 2.05 at Day 1,000. *The 80/20 Company* teaches its zones. Chapter 12.

Shadow board. A board with each tool's outline drawn on it, so a missing tool shows at a glance. Chapter 4.

Simplify before you improve. Quad 4 work gets its exit, reprice or starve decision before anyone runs a kaizen on it. Never make waste efficient. Chapter 1.

Skills matrix. Team members against tasks, each square marked learning, can do with help, can do alone, or can teach, with a cross-training plan and dates. Chapter 11.

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SMED (single-minute exchange of die). Shigeo Shingo's method for cutting changeovers: separate internal from external work, move the external work outside the stop, shorten what remains. Chapter 8.

SQDCP. Safety, quality, delivery, cost and people: the five letters across the top of every huddle board, in that order, safety first. Chapter 8.

Standard work. The best known way to do the work today, written by the people who do it, timed to takt, on three documents: the combination sheet, the standard work chart, the job instruction breakdown. Chapter 6.

Supermarket. A small, fixed store of parts between two processes that can't flow into each other, replenished by kanban and capped by its cards. Chapter 9.

Sustain audit. A quarterly walk of a sample of the routines by a leader from another area, scoring the routines, not the people. Chapter 14.

Takt time. Available time divided by customer demand. The drumbeat the work is designed to. At Brennick's Cell 1, 900 minutes for 240 frames, 3.75 minutes. Chapter 6.

Team leader. A working leader for a team of six to ten, with about half the day free for the team: the huddle, the hour-by-hour, the andon in two minutes, relief, the idea cards, job instruction. Chapter 11.

Tiered huddle. Short stand-up meetings at a board, at each level of the company, timed so a problem raised at 6:05 can be answered before lunch. Chapter 8.

Total employee cost. Every dollar spent on people, in the plant and the office: wages, benefits and payroll taxes, plus contractors doing employees' work. Chapter 12.

TPM (total productive maintenance). Operators caring for their machines daily (clean, inspect, lubricate, tag), with maintenance taking the planned work. Chapter 8.

Two deep. Every routine has an owner and a second who has run it. Chapter 14.

Value. What the A customer pays for, in the A customer's words. Chapter 2.

Value-add test. Three questions a step must pass to count as value-added: does it change the product, would the A customer pay for it, is it done right the first time? Steps that fail are necessary (minimize them) or waste (remove them). Chapter 2.

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Value stream, value stream map. Every step that brings a product from order to customer, office included, and the one-page map of it: processes, queues in days, information flow, timeline. Chapter 9.

Waste walk. Ninety minutes along the product's path with a mixed team, every waste on its own card, no names, then priced in the ledger's lines. Chapter 3.

Water spider. A material handler on a fixed route who keeps every station supplied, so no operator walks for parts. Chapter 8.

Work time. The minutes in a lead time that change the product. At Brennick, forty-eight minutes in forty-two working days. Chapter 2.

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Notes on Sources

Each epigraph and each From the Record piece rests on a source you can look up, listed below by chapter. Brennick Door & Frame and everyone in it are invented, so there is nothing to cite for them. The same goes for the aim and the order of the program — the Quad of the work, the model line chosen in Quad 1, simplify before you improve, the four fades and their antidotes, the four results, the finance-signed bridge, the rhythm and two deep. That is how I run Lean and how The 80/20 Institute teaches the program, and it is this book's own argument.

The method. The tools in this book were built by many hands, most of them at Toyota, and these are the sources I trust for them. Taiichi Ohno, *Toyota Production System: Beyond Large-Scale Production* (Cambridge, MA: Productivity Press, 1988, first published in Japanese, 1978), for just in time, jidoka, the supermarket and the wastes. John F. Krafcik, "Triumph of the Lean Production System," *Sloan Management Review* 30, no. 1 (Fall 1988), for the name. James P. Womack, Daniel T. Jones and Daniel Roos, *The Machine That Changed the World* (New York: Rawson Associates, 1990), and James P. Womack and Daniel T. Jones, *Lean Thinking* (New York: Simon & Schuster, 1996), for the principles. Mike Rother and John Shook, *Learning to See* (Brookline, MA: Lean Enterprise Institute, 1998), for the value stream map. Shigeo Shingo, *A Revolution in Manufacturing: The SMED System* (Cambridge, MA: Productivity Press, 1985), and *Zero Quality Control: Source Inspection and the Poka-yoke System* (Cambridge, MA: Productivity Press, 1986). Seiichi Nakajima, *Introduction to TPM* (Cambridge, MA: Productivity Press, 1988), for overall equipment effectiveness. Hiroyuki Hirano, *5 Pillars of the Visual Workplace* (Portland, OR: Productivity Press, 1995), for 5S. David Mann, *Creating a Lean Culture* (New York: Productivity Press, 2005), for leader standard work. Joseph M. Juran, ed., *Quality Control Handbook* (New York: McGraw-Hill, 1951), for the vital few and the Pareto chart. Kaoru Ishikawa, *Guide to Quality Control* (Tokyo: Asian Productivity Organization, revised English edition, 1976; Japanese original published by JUSE Press, 1968), for

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the cause-and-effect diagram. Vilfredo Pareto, whose name the 80/20 principle carries: *Cours d'économie politique* (Lausanne: F. Rouge, 1896–97).

The masterclass. The definition of Lean quoted in Chapter 2, the DOWNTIME mnemonic, the value-add test's three questions, the takt example of 480 minutes and 400 units, the three kinds of measure and the sources of targets are from The 80/20 Institute's course materials for its Lean masterclass, *Fundamentals of Lean Methodology* (2024), and are used with the Institute's permission.

The author's other books. Several chapters draw on my earlier books, and each says so where it does. *The 80/20 Company* (Eighty20 Publishing, 2026) — the Quad, the simplification register, the Right to Grow ratio and the thousand days. *The Strategy Deployment Process* (Eighty20 Publishing, 2026) — the X-Matrix, the bowler and the monthly review. *The Strategy Management Process* (Eighty20 Publishing, 2026) — the plan. *Get Paid* (Eighty20 Publishing, 2026) — pricing. *The Rule of Three: How Visionaries, Prophets, and Operators Make Your Business Unstoppable* (Matt Holt Books / BenBella, 2026) — the 3-L Tour. *Earn the Right to Win* (Matt Holt Books / BenBella, 2026) — the rules for a gemba walk and "progress, not perfection." *Something to Prove* (forthcoming) — the people. When an epigraph comes from one of them, it is quoted word for word, with its source under it.

How to Read This Book

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Chapter 1 — Aim Before You Improve

Epigraph. Peter F. Drucker, "Managing for Business Effectiveness," *Harvard Business Review* 41, no. 3 (May–June 1963).

Simplified practice and the paving brick, 1920s. The reductions in vitrified paving brick (66 varieties of size and shape cut to 11, then to 7, then to 6 in active use, and four sizes on the recognized list after a fourth revision conference in March 1925) are recorded in the Department of Commerce's *Simplified Practice: Monthly News Bulletin*, no. 1 (April 15, 1925), published by the Division of Simplified Practice. The Bureau of Standards' bulletins of 1925 credit the program to the Department

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of Commerce and to Herbert Hoover's encouragement as Secretary of Commerce (1921–28).

Chapter 2 — Value Is What the A Customer Pays For

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Chapter 3 — Learn to See the Waste

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The eight wastes. The seven are Ohno's. The eighth, unused talent, was added by Western practitioners.

Chapter 4 — Make the Workplace Speak

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Chapter 5 — Small Changes, Every Day

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Chapter 6 — Write the Best Way Down

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Chapter 9 — Map the Flow

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Chapter 10 — Stop Problems at the Source

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