PMF MISSION HANDBOOK

Advanced Product-Market Fit: Tactics, Tools & Diagnostics

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THIS DOCUMENT CONTAINS

Part 1 — PMF OPORD Template: How to run a PMF mission
Part 2 — Mission Action Menu: 30 tools organised by type, frameworks for sequencing them
Part 3 — Resources

Originally created by Patrick Connolly for a guest lecture at the International Space University.

PART 1

The PMF OPORD: How to Run a PMF Mission

In military doctrine, an OPORD (Operations Order) is a standardised 5-paragraph format that forces clarity before action: what is the situation, what is the mission, how will it be executed, what resources are needed, and who commands what. Applied to PMF work, it serves the same purpose — it forces you to commit to a hypothesis, a method, a timeline, and an interpretation framework before you spend a single day or dollar.

A PMF Mission is any direct, time-bounded action taken with the explicit purpose of generating evidence that either increases, validates, or refutes a product-market fit hypothesis. It is not a product build. It is not a sales call. It is a designed experiment with a clear question, a clear method, and a clear interpretation rule.

PMF OPORD Template

How to Use This Template

Complete one OPORD per PMF mission. A mission typically runs 1–3 weeks. At the end of the mission, fill in Section 5 (Results) and archive it. Over time, your OPORD stack becomes your PMF evidence base — the thing you show investors, co-founders, and yourself when the question 'how do you know?' comes up.

PMF MISSION ORDER (OPORD)

Classification: Founder Eyes Only · Version: _____ · Date: _____

1 SITUATION — The Ground Truth Right Now

Current PMF score / signal:

_____

What do we know for certain about our customer?

_____

What are we most uncertain about?

_____

Who is our beachhead segment right now?

_____

Who are our key competitors / alternatives?

_____

What is our runway (time + budget)?

_____

2 MISSION — The Hypothesis to Test (Answer the 5 Ws)

State in ONE sentence: [WHO] will take [WHAT ACTION] using [WHICH TOOL] between [DATE] and [DATE] in order to answer [SPECIFIC QUESTION].

Mission statement:
_____

_____
___
Core hypothesis: We believe that
_____

_____
___
Null hypothesis (what would falsify this):
_____
Why this mission now (not a different one)?
_____

3 EXECUTION — The Plan of Action

Primary method / tool selected:
_____
Why this method over alternatives?
_____
Step-by-step execution plan:
Step 1: _____ by [date] · Step 2: _____ by [date]
Step 3: _____ by [date] · Step 4: _____ by [date]
Step 5: _____ by [date]
Target sample (who exactly):
_____
Minimum sample size for confidence: _____ · Recruitment method:
_____
Data capture method:
_____
Go/No-go decision rule (pre-committed):
_____

4 SUSTAINMENT — Resources & Risk

Time budget: _____ days · Financial budget: _____ · Personnel:
_____
Tools / software required:
_____
Key risk if this mission fails:
_____
Contingency if sample not reached:
_____
What should NOT be done during this mission (scope control):
_____

5 RESULTS & COMMAND — Post-Mission Debrief (complete after mission)

What data was collected?

_____

Was the hypothesis confirmed, refuted, or inconclusive?

_____

What surprised you?

_____

PMF signal strength now:

_____

DECISION — next mission will: □ Confirm this finding □ Pivot the hypothesis □ Change segment □ Build

Next mission title:

_____

Why the OPORD format works for PMF

It forces you to commit to an interpretation rule BEFORE you collect data — eliminating confirmation bias.

It treats each PMF test as a mission with a beginning, middle, and end — not an ongoing vague activity.

It creates an evidence archive: 6 completed OPORDs represent more investor-ready evidence than 100 informal customer calls.

The 'null hypothesis' field is the most important. If you can't state what would falsify your belief, you don't have a testable hypothesis — you have a hope.

PART 2

Mission Action Menu: 30 PMF Tools

These are the actions available to a founder seeking PMF. Organised into four categories: Research (find out), Product (build and test), Channel (reach and acquire), and Strategic (reposition or pivot). Each tool has a cost profile, a best stage for use, and a PMF question it is designed to answer.

> **The Cardinal Rule of Sequencing**
>
> Research before building. Channel testing before scaling. Retention before growth.
>
> The highest-value sequence in almost every market: 3–5 customer discovery interviews → pricing experiment → focused MVP → cohort analysis → channel test → partner or scale.
>
> Doing these in the wrong order doesn't just waste time — it generates false signals that send you in the wrong direction at full speed.

Category 1: Research Actions — Find Out Before You Build

Tool	What It Answers	Best Stage	Cost	PMF Signal
Customer Discovery Interview	Who is the real buyer? What is the actual pain hierarchy? What words do they use?	Early (first priority)	Low: 5–10 days, £2–5K	Verbal pain signals, willingness to book follow-up, unsolicited referrals
Jobs-to-Be-Done (JTBD) Interview	What job is the customer hiring your product to do? What did they fire before you?	Early / Mid	Low: 5–8 days	Switching story clarity, functional + emotional + social job articulation
Sean Ellis Survey (40% Test)	Do you have PMF signal? How strong? Which segment loves you most?	Mid (after 40+ users)	Very Low: 1–2 days	% 'very disappointed' — benchmark: 40%+ = strong signal
Win / Loss Interview	Why did you win the deals you won? Why did you lose? What did the customer choose instead?	Mid / Late	Low: 3–5 days	Decision criteria, competitive positioning, objection patterns

Cohort Retention Analysis	Are users coming back? Which cohort retains? At what point do they churn?	Mid (after MVP)	Low: 2–3 days if data exists	D7, D30 retention curves — benchmark: D30 >25% for B2B SaaS
NPS Deep Dive	Who are your promoters? What exactly do they love? What separates them from detractors?	Mid / Late	Low: 3–4 days	NPS score + qualitative themes from promoters
Landing Page Signal Test	Does your message resonate before you build? Which value prop converts?	Early	Low: 3–5 days, £3–8K	Click-through rate, email sign-up rate, CTA specificity
Competitive Landscape Map	Where is the white space? Who is winning in adjacent segments? Why?	Any	Low: 3–5 days	White space identification, differentiation clarity

Category 2: Product Actions — Build Signal Into What You Ship

Tool	What It Answers	Best Stage	Cost	PMF Signal
Wizard of Oz MVP	Does the customer value the outcome of your product before you automate it?	Early	Low-Med: 5–10 days	Customers pay / return even knowing it's manual
Concierge MVP	Can you deliver the value proposition manually for 5 customers before building for 50?	Early	Low: 5–15 days	Customer willingness to pay at manual unit economics
Smoke Test / Pre-sell	Will customers pay before the product exists? What is the real WTP?	Early	Very Low: 2–5 days	Pre-orders, deposits, LOIs — real WTP revealed by payment behaviour
Pricing Experiment	What is real WTP? Does price signal quality or deter the right segment?	Early / Mid	Low: 3–5 days	Conversion rate by price tier, churn by price tier

Feature Sprint & Dogfood	Does the new feature increase retention or engagement in the power user cohort?	Mid	Med: 8–14 days	D30 retention change in cohort that received feature vs. control
Onboarding Redesign Test	Where are users dropping off before they experience core value? Fix it.	Mid	Med: 5–10 days	Time-to-value, activation rate improvement
API / Integration Build	Does connecting to the customer's existing stack increase stickiness?	Mid / Late	High: 15–25 days	Churn reduction, expansion revenue from integrated accounts
Freemium / PLG Tier Launch	Can users self-discover value without a sales motion?	Mid	Med-High: 10–20 days	Freemium-to-paid conversion rate; benchmark: 2–5%

Category 3: Channel Actions — Find Where Your Customer Actually Lives

Tool	What It Answers	Best Stage	Cost	PMF Signal
Channel Experiment (3-channel test)	Which channel produces the lowest CAC with the highest D30 retention?	Mid	Med: 8–12 days, £10–20K	CAC by channel, D30 retention by channel — find the intersection
Conference + Demo Loop	Does live demonstration produce qualified pipeline? What objections surface?	Mid / Late	Med: 4–6 days, £5–10K	Qualified follow-up rate, demo-to-trial conversion
Outbound Sequence Test	Does a specific ICP respond to a specific message? What subject line opens?	Mid	Low: 5–8 days, £3–8K	Open rate, reply rate, meeting book rate by message variant

Community / Slack Test	Does the problem community gather anywhere? Can you provide value there?	Early / Mid	Very Low: 5–10 days	Inbound requests from community posts, organic word-of-mouth
Referral Programme Pilot	Do existing customers refer without incentive? What triggers organic referral?	Mid / Late (after retention proven)	Low: 3–5 days, £2–5K	Referral rate; benchmark: NPS >50 produces ~15% natural referral
Paid Acquisition Test	What is the real CAC for your best segment with proven retention?	Late (ONLY after D30 >25%)	Med-High: 5–8 days, £15–30K	CAC vs. LTV ratio — minimum viable: LTV:CAC > 3:1
Strategic Partnership Pilot	Can a partner channel provide warm access at near-zero CAC?	Mid / Late	Med: 10–15 days, £5–15K	Partner-sourced pipeline quality vs. direct — do they convert better?
PR / Press Campaign	Does earned media build brand with the right segment?	Late (PMF > 40% first)	Med: 5–8 days, £10–20K	Inbound lead quality post-press — are they the right segment?

Category 4: Strategic Actions — Reposition, Pivot, or Double Down

Tool	What It Answers	Best Stage	Cost	PMF Signal
Segment Pivot	Is there a different segment where our core technology has stronger fit?	Any (after 2+ failed segments)	Med: 7–14 days	New segment's pain × WTP × urgency score vs. original
Beachhead Narrowing	What is the smallest segment where we can win completely before expanding?	Early / Mid	Low: 3–5 days	Concentration of ideal customers — can we own 30%+

				of a small segment?
Competitive White Space Analysis	What segment are our best competitors ignoring and why?	Any	Low: 5–7 days	Underserved segment identification with clear reason competitor is absent
PMF Narrative (Reforge)	Can we articulate our PMF thesis in one page? Where are the gaps?	Any	Very Low: 1–2 days	Internal clarity — if the team can't agree on the narrative, there's no PMF
Investor Signal Test	Do informed investors (not just supportive ones) believe this thesis?	Mid / Late	Low: 3–5 days	Specific objections raised — each objection is a PMF hypothesis to test
Board / Advisor Challenge Session	What assumptions are we holding that experts in the domain would challenge?	Any	Very Low: 1–2 days	Assumptions surfaced by people who have seen the pattern before

Framework 1: The Sequencing Stack

Not all tools are equal at all times. The right tool at the wrong stage produces misleading data. This is the sequencing stack for most B2B, deep-tech, and space ventures:

The Discovery-to-Scale Stack — Run in This Order

STAGE 1 — DISCOVER (Days 1–30): Customer discovery interviews (×3–5) → JTBD interview (×2) → Competitive white space analysis → Segment pivot if needed

STAGE 2 — VALIDATE (Days 30–60): Smoke test / pre-sell → Pricing experiment → Landing page signal test → PMF Narrative draft

STAGE 3 — BUILD (Days 60–90): Concierge MVP or Wizard of Oz → Onboarding redesign → Sean Ellis Survey (first run)

STAGE 4 — CHANNEL (Days 90–120): Community test → Channel experiment (3 channels) → Conference + Demo → Win/Loss interview

STAGE 5 — SCALE (Days 120+): Paid acquisition (ONLY if D30 >25%) → Strategic partnership → Referral programme → Press

RULE: Never move to the next stage until the previous stage has produced a clear signal. Premature movement is how companies burn runway on the wrong thing.

Framework 2: The PMF Diagnostic Matrix

Use this 2×2 to identify your current PMF problem type and choose the right tool:

HIGH Pain Signal, LOW WTP

Symptom: Customers love demos, never pay. NPS high, revenue zero.

Problem: Wrong segment. The people with the pain don't have the budget.

Tools: Win/Loss Interview, Segment Pivot, Beachhead Narrowing

HIGH WTP, LOW Pain Signal

Symptom: Customers pay once, don't return. Revenue but no retention.

Problem: Wrong job. You solved a problem they have, not the one they feel.

Tools: JTBD Interview, Cohort Analysis, Onboarding Redesign

LOW Pain, LOW WTP

Symptom: Polite conversations. No urgency. 'Sounds interesting.'

Problem: Wrong market or wrong timing. This may be a Future Vision product.

Tools: Competitive White Space, Segment Pivot, Investor Signal Test

HIGH Pain, HIGH WTP

Symptom: Customers pay, return, refer. You can't build fast enough.

Problem: Maintenance. PMF is a state, not a certificate. What could break it?

Tools: Sean Ellis Survey, NPS Deep Dive, Channel Experiment to scale

Framework 3: The Deep-Tech PMF Adaptation

Standard PMF tools assume you can iterate cheaply and quickly. Deep-tech, space, and biotech ventures cannot. These three adaptations are non-negotiable for your sector:

Adaptation 1 — Use Pilots as Discovery Engines (Not Revenue)

In deep tech, your first 3–5 customers are not revenue — they are your customer discovery team. Treat every pilot as a structured OPORD. What are you learning, not just what are you earning.

The failure mode: treating a pilot as validation when it is only tolerance. A customer who runs a pilot is curious. A customer who renews the pilot at their own cost is validated.

Adaptation 2 — Map the Decision-Making Unit Before You Design the Value Proposition

In B2B deep-tech, the person with the pain is almost never the person with the budget. Map: User (feels the pain) / Champion (wants the change) / Economic Buyer (signs the contract) / Technical Gatekeeper (approves the spec) / Legal/Compliance (approves the risk).

Your value proposition must speak to the Economic Buyer. Your product must satisfy the Technical Gatekeeper. Your champion is your internal salesperson — they need collateral, not just a good product.

Adaptation 3 — Build Your PMF Thesis Around Loss Conditions, Not Just Gain

Ask not 'what would cause a customer to buy this?' but 'what would cause a customer who already uses this to stop?' Those loss conditions are your PMF fragility map.

For space: a regulatory change, a competitor achieving mission heritage first, a launch cost curve shift, or a customer's internal budget reallocation. Each of these is a PMF hypothesis to monitor.

This is the difference between finding PMF and maintaining PMF. Tunguz (2025): PMF is like airline status — you have to fly to keep it.

PART 3: ADDITIONAL RESOURCES

Links, Tools & Further Reading

Essential Tools

- Sean Ellis PMF Survey tool (free): pmfsurvey.com
- Superhuman PMF Engine methodology: review.firstround.com/how-superhuman-built-an-engine-to-find-product-market-fit
- Reforge PMF Narrative template: reforge.com (requires account)
- Sequoia Arc Framework (Hair on Fire / Hard Fact / Future Vision): arc.sequoiacap.com
- Georgia Tech Deliberate Innovation PDF (loved by instructor): cdi.gatech.edu/TowardsDeliberateInnovation.pdf

Case Study Primary Sources

- HBS Iridium case: hbs.edu/faculty/Pages/item.aspx?num=27780
- OneWeb collapse analysis: interactive.satellitetoday.com/via/oneweb-special-edition
- Varda Not Boring deep-dive: notboring.co/p/varda-the-space-drug-factory
- Varda Contrary Research breakdown: research.contrary.com/company/varda
- Planet Labs analysis: unconventionalvalue.com/p/the-big-picture-planet-labs
- Space-based biomanufacturing LifeSciVC: lifescivc.com/2025/05/boosters-and-biologics-is-space-based-biomanufacturing-real
- Smithsonian Iridium comeback: smithsonianmag.com/air-space-magazine/the-rise-and-fall-and-rise-of-iridium-5615034

Deep-Tech PMF Reading

- Marc Andreessen original PMF essay (2007): a16z.com/product-market-fit — send as pre-read
- HBR deep-tech lean startup adaptation — search 'lean startup deeptech HBR Aulet'
- McKinsey LEO constellation analysis: mckinsey.com/industries/aerospace-and-defense/our-insights/large-leo-satellite-constellations-will-it-be-different-this-time
- Tunguz on PMF as maintained state (2025): tomtunguz.com