This document includes two AI prompts that help you prepare a complete and structured request.

Prompt #1

I am preparing a request for Design for Manufacturability (DFM) services by the EnCata team and want to make sure my input contains enough information to identify production risks before tooling, pilot production, or manufacturing release.

Here is my current input:

"<<<INSERT YOUR INPUT HERE>>>"

At EnCata, a DFM request should clarify the following areas:

1. Product and DFM goal

- What the product is
- What stage of development it is currently at
- Why a DFM review is needed now
- What the next manufacturing milestone is: pilot batch, 1,000 units, 10,000 units, or another target
- Whether the main goal is production readiness, cost reduction, assembly improvement, supplier handoff, or resolving manufacturer feedback

2. Target production volume

- Expected quantity for the first production run
- Expected annual or long-term production volume
- Whether the volume is expected to increase later
- Whether production volume is already fixed or still being evaluated

3. Manufacturing processes and tooling

- Which manufacturing processes are currently planned
- Whether a manufacturer or supplier has already been selected
- Whether tooling has already been quoted, ordered, or manufactured
- Known tooling limitations or supplier capabilities
- Whether alternative production methods may be considered

4. Mechanical design

- Whether 3D CAD and production drawings are available
- Materials currently specified
- Critical dimensions and tolerances
- Surface finish requirements
- Fastening and joining methods
- Sealing, bearings, fits, welds, coatings, or other mechanically critical features
- Known manufacturability concerns

5. Electronics and PCB/PCBA

- Whether PCB design files are available
- Whether the PCB layout is considered final
- Expected PCB/PCBA manufacturing process
- Connectors, cables, mounting, and enclosure integration
- Programming or firmware flashing requirements
- Existing test points or production-test access
- Known electronics manufacturing concerns

6. Assembly

- How the product is assembled
- Approximate part count

- Fasteners, adhesives, inserts, press fits, soldering, welding, or other assembly operations
- Whether the assembly sequence has already been defined
- Whether manual fitting, adjustment, or calibration is required
- Whether a prototype or trial assembly has already been built

7. Testability and quality control

- What must be tested during production
- Whether functional tests, inspection, calibration, or programming are required
- Whether a production test procedure already exists
- Whether dedicated fixtures are required
- What determines whether a finished unit passes or fails

8. BOM and component sourcing

- Whether the BOM is available and considered stable
- Components that are difficult to source or have long lead times
- Obsolete or end-of-life components
- Single-source parts
- Approved alternatives or second sources
- Known supplier dependencies

9. Cost targets

- Target unit manufacturing cost, if known
- Tooling budget
- Areas where production cost is currently too high
- Whether labor, tooling, components, materials, or another cost driver is the main concern
- Whether cost optimization must preserve specific product features or performance

10. Supplier and factory constraints

- Whether a manufacturer has already reviewed the design
- Any supplier or factory comments already received
- Manufacturing equipment or process constraints
- Material or component restrictions
- Minimum order quantities or lead-time constraints
- Whether the design needs to be prepared for one specific manufacturer or remain transferable between suppliers

11. Existing engineering files

- CAD files
- Mechanical drawings
- PCB design files
- Gerbers or ODB++
- BOM
- Assembly files
- Firmware requirements
- Test procedures
- Supplier comments
- Existing quotations
- Previous DFM reports or production findings

12. Known production risks

- Difficult or slow assembly steps
- Excessive manual work
- Tight or uncertain tolerances
- Fit or tolerance-stack issues
- Poor test access
- Fragile parts
- Tooling concerns
- Difficult-to-source parts

- Yield concerns
- Product features that may be difficult to manufacture repeatedly

13. Manufacturer feedback

- Whether the manufacturer has already requested changes
- Which CAD, PCB, BOM, drawing, or process issues have been raised
- Whether any factory comments are unclear or contradictory
- Whether EnCata should communicate directly with the manufacturer

14. Expected outcome

- Whether you need only a DFM review or also implementation of the recommended changes
- Whether updated CAD, PCB, BOM, drawings, or assembly documentation are required
- Whether support during manufacturer handoff or pilot production is needed
- What decision should be possible after the DFM work is complete

Your task:

- Identify missing, unclear, or weakly defined areas in my input
- Structure your answer by the categories above
- For each gap, briefly explain why it matters for DFM
- Distinguish production blockers from information that can be clarified later
- Do not perform the DFM review itself yet
- Do not invent manufacturing processes, tolerances, costs, production volumes, or supplier constraints that I have not provided
- Do not rewrite my request. Focus only on identifying gaps

Important instructions for your response:

- Use clear and practical language
- Keep clarification questions short and easy to answer
- Avoid unexplained manufacturing terminology
- If technical wording is necessary, briefly explain it in simple terms
- Focus on helping a non-manufacturing specialist understand what information EnCata needs

Prompt #2

I am continuing preparation of my Design for Manufacturability (DFM) request based on your previous analysis.

Here is my initial input:

"<<<INSERT INITIAL INPUT HERE>>>"

Here is the additional information I have provided to fill the gaps:

"<<<INSERT ADDITIONAL INFORMATION HERE>>>"

At EnCata, a DFM request requires clarity in the following areas:

1. Product and DFM goal
2. Target production volume
3. Manufacturing processes and tooling
4. Mechanical design
5. Electronics and PCB/PCBA
6. Assembly
7. Testability and quality control
8. BOM and component sourcing
9. Cost targets
10. Supplier and factory constraints
11. Existing engineering files

12. Known production risks
13. Manufacturer feedback
14. Expected outcome

Your task:

1. Re-evaluate the combined input (initial + additional information)
2. Identify what is still missing, unclear, or weakly defined
3. Check whether the available information is sufficient to define a DFM review scope
4. Based on the available information, compile a structured Design for Manufacturability request for EnCata

If some information is still unavailable:

- Clearly mark it as "Missing information"
- Where a low-risk assumption can reasonably be made, mark it as "Assumption"
- Do not invent manufacturing processes, tolerances, tooling requirements, production volumes, supplier capabilities, component alternatives, or cost targets that the input does not support

If the manufacturing process or supplier has not yet been selected:

- Describe the product and production requirements instead of selecting a process without sufficient evidence
- Clearly state that manufacturing-process or supplier selection should be included in the EnCata scope where relevant

Structure the final request as follows:

1. Project overview

What the product is, its current development stage, and why DFM is required now.

2. Production target

Expected production volume, upcoming manufacturing milestone, and whether future scale-up is expected.

3. Current manufacturing approach

Planned manufacturing processes, tooling status, selected or potential suppliers, and known production constraints.

4. Mechanical design status

Available CAD and drawings, materials, tolerances, surface requirements, fastening, sealing, fits, and other relevant mechanical details.

5. Electronics and PCB/PCBA status

PCB readiness, electronics manufacturing requirements, component placement, connectors, cables, programming access, test points, and known electronics production constraints.

6. Assembly requirements

Part count, joining methods, assembly sequence, manual operations, adjustment, calibration, and any known assembly difficulties.

7. Testability and quality requirements

Production tests, inspection, calibration, programming, fixtures, acceptance criteria, and other quality-control requirements.

8. BOM and sourcing

BOM status, component availability, lifecycle risks, long-lead parts, single-source components, approved alternatives, and supplier dependencies.

9. Cost and tooling considerations

Known unit-cost targets, tooling budget, major cost drivers, and areas where cost optimization is required.

10. Factory and supplier constraints

Known manufacturer capabilities, restrictions, supplier comments, production feedback, and any factory-specific requirements that the design must satisfy.

11. Existing engineering package

Available CAD, drawings, PCB files, Gerbers or ODB++, BOM, assembly documentation, firmware requirements, test procedures, prototype information, quotations, and supplier feedback.

12. Known production risks

Existing concerns related to manufacturability, assembly, tolerances, test access, sourcing, tooling, yield, manual work, or repeatability.

13. Manufacturer feedback

Existing factory comments, unresolved questions, requested engineering changes, and whether direct communication with the manufacturer is required.

14. Required DFM scope

Based on the project information, specify which of the following should be included:

- Manufacturing process and tooling review
- Mechanical DFM
- PCB/PCBA DFM
- Design for Assembly (DFA)
- Design for Testability (DFT)
- BOM and sourcing review
- Tolerance and material review
- Factory feedback review
- Production cost optimization
- Supplier or manufacturer coordination

Only include areas that are relevant to the provided project information.

15. Expected deliverables

Depending on the scope, these may include:

- Initial production-risk snapshot
- Missing-input list
- Recommended review scope
- Prioritized DFM report
- DFM / DFA / DFT findings
- Production questions
- Recommended design changes
- BOM recommendations
- Supplier questions
- Updated CAD
- Updated PCB files
- Updated BOM
- Updated assembly or test documentation
- Resolved manufacturer comments
- Manufacturing release package
- Pilot production support

Only include deliverables that are relevant to the provided project information.

16. Expected outcome and next step

Describe what should happen after the DFM work: design freeze, tooling order, pilot batch, manufacturing release, supplier handoff, or another production step.

Output requirements:

- A structured draft request ready to send to EnCata
- Clearly mark assumptions and missing information
- Keep the response clear and practical
- Do not include explanations outside of the request
- Separate production blockers from lower-priority improvements where the provided information makes this possible
- Do not over-specify manufacturing decisions that should be resolved during the DFM review