GLC IEDSS

User Manual

Industrial Engineering Decision Support System

Prepared by

L. Venkatesan, Founder — Gayathri Lean Consultancy

Document Version

1.0

For internal use by

IE department users and study reviewers

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1. Introduction

This manual is a working reference for anyone entering data into, running a study through, or reading the output of GLC IEDSS. It is written for the person standing at a workstation with a stopwatch and a laptop, not for a software audience — the goal is that you can open this manual mid-study and find the answer to the question in front of you.

GLC IEDSS (Industrial Engineering Decision Support System) takes one structured, station-by-station production study and generates the connected documentation set an IE department normally builds by hand: bottleneck and buffer analysis, motion waste (MTM) findings, Engineering Review Board (ERB) questions, Yamazumi and line-balance charts, a value stream map, and standard work visuals — all cross-linked from the same source data.

The system is only as good as what goes into it. Most of this manual is therefore about the two things that determine output quality: how the workbook is structured, and how the elemental descriptions are worded. Get those two right and the rest — the charts, the findings, the priority list — takes care of itself.

2. Who This Manual Is For, and What It Covers

This manual covers day-to-day use: feeding data, writing elemental descriptions, reading what the system produces, and resolving the handful of issues that come up most often. It does not cover installation, licensing activation, or the internal logic of the analysis engine — those are covered separately, and your GLC contact can provide that reference if you need it.

Intended readers

- Industrial engineers and time-study analysts entering and reviewing data.
- Line supervisors and cross-functional reviewers reading the output during an Engineering Review Board session.
- New team members being onboarded onto the system for the first time.

3. How to Feed Data

Data entry happens in a single Excel workbook with two kinds of sheets: one Index sheet, and one sheet per station. Understanding how these two talk to each other is the single most important thing in this manual — most output problems trace back to this relationship, not to the analysis itself.

3.1 The Index Sheet

The Index sheet is the master record for the whole study. The top block is for direct input — Customer, Line/Project name, Study Date, Takt Time, Shift, and Industry Type. Fill this in first; several downstream calculations (line balance efficiency, bottleneck flagging) reference Takt Time directly.

Below that header block, every row represents one station. Columns A–D (station identity — station number, process name, station type) are typed in directly. The remaining columns — manpower, cycle time, VSM fields, ECRS summary — are not typed in; they are pulled automatically from each station's own sheet.

3.2 Station Sheets

Each station gets its own sheet, named to match its station number exactly (for example, a row that says "Stn-3" in the Index must have a tab literally named "Stn-3"). This name is the link between the two — if the names don't match character-for-character, that station's data will not appear on the Index.

Two station templates are provided:

- Man Process template — for manual or semi-automatic stations. Element-by-element data entry with automatic Time/Unit, Average, and Variation % calculation per line.
- Man-Machine Combined template — for stations with both operator and machine cycles. Includes the same element table plus a separate Man-Machine chart capturing operator and machine time across three cycles, and an Internal/External changeover split.

Choose the template that matches the station before you start entering data — converting a station from one template to the other mid-study is not a simple copy-paste and should be avoided.

3.3 Adding a New Station

1. Duplicate the correct template tab (Man or Man-Machine).
2. Rename the new tab to your station's exact number (this must match what you will type into the Index row — check spacing and capitalization).
3. Add a new row on the Index sheet and type that same station number into the identity column.
4. Save the workbook. The Index row should populate automatically from the new sheet.

If the row does not populate after saving, the tab name and the Index entry do not match exactly — this is the most common data-entry mistake in the whole system. Re-check spelling, spacing, and hyphens before assuming anything else is wrong.

3.4 Units and Conventions — Read Before You Start

> **Watch this one**
> Some station sheets carry a local Space field labeled in Sq.ft², separate from the Index sheet's own Space field, which is labeled in m². Only the Index sheet's field feeds the calculations. Always enter Space directly on the Index sheet, in m² — do not rely on the station sheet's local box.

Other entry conventions to hold to consistently:

- Present MP and Proposed MP (manpower) are read from the Index sheet only. If left blank, the system silently defaults to 1 — it will not flag a blank cell as missing, so double-check these before treating the output as final.
- Observed Cycle Time is the one field that is not manually entered on the Index — it is recalculated live from each station's own elemental time readings, so it will always reflect real data even when other fields haven't been filled in yet.
- Enter times in the same unit throughout a study (seconds is standard) — mixing units across stations silently corrupts the Yamazumi chart's proportions.

4. How to Write the Current Activity in Elemental Form

This is the section worth reading twice. The system reads your elemental description text to identify motion type, generate ECRS questions, and route findings to the right engineering category. A vague or badly-worded description doesn't just look untidy — it produces a weaker or wrong finding downstream. Good elemental writing is what makes the automation worth trusting.

4.1 One Motion, One Element

Break the activity into single, distinct motions — don't compress two actions into one line. "Pick and place the shell" hides two separate motions (a reach/grasp and a positioning) behind one description; split it into two elements so each gets analyzed on its own terms.

4.2 Lead With the Verb

Write every element starting with the action word, the way a real time-study is spoken on the floor: "Insert the PCB," not "The PCB is inserted." This isn't a style preference — the system's motion-detection reads the sentence left to right and expects the verb in front. Writing the object first ("Shell placed on fixture") can cause the motion type to be missed or mis-detected.

A second reason this matters: a handful of English words work as both a verb and a noun ("place," "press," "insert"). When the verb comes first, the system can tell the difference reliably. When a description buries the action mid-sentence, a word like "places" (meaning locations) can be mistaken for the verb "place."

4.3 Name Parts Consistently

Use the same part name every time you refer to the same component, and use the actual component name rather than "this part" or "the item." If your project has a Parts list file, list every named component there once at the start of the study — the system pulls from it so that generated questions read "why is manual insertion of the shell required" instead of the generic "why is manual insertion of this part required."

If a part genuinely isn't in the list yet, the system will fall back to a generic "the part" phrasing rather than guessing — if you notice that fallback appearing often in your output, it's a sign to go back and add the missing names to the Parts list, not a system error.

4.4 Good vs. Poor Elemental Descriptions

Poor	Better
"Part handling"	"Pick the shell from the bin"
"Assembly step"	"Insert the PCB into the shell"
"Pick and place shell, then screw"	Split into: "Pick the shell," "Place the shell on fixture," "Tighten the screw"
"Operator does inspection"	"Visually inspect the weld for porosity"
"Move to next station"	"Walk to Station 4 carrying the sub-assembly"

5. Do's and Don'ts

Do	Don't
Fill in the Index header block (Takt Time, Shift, Study Date) before entering any station data.	Leave Present MP or Proposed MP blank and assume the system will flag it — it silently defaults to 1.
Match station tab names to Index entries exactly, including spacing and hyphens.	Rename a station tab after the study is underway without updating the Index row to match.
Write elemental descriptions verb-first, one motion per line.	Compress two motions into a single element description.

Do	Don't
Keep the Parts list current as new components appear in the study.	Refer to a component as "this part" when a real name is available.
Enter Space, Distance, and WIP directly on the Index sheet.	Rely on a station sheet's local mini-table for values the Index doesn't actually read from.
Use one consistent time unit (seconds) across every station in the study.	Mix seconds and minutes across different stations in the same study.
Review the Priority Engine's ranked list before starting implementation.	Jump straight to the first finding on the page without checking how it was ranked.
Re-run the study after implementing a change, to confirm the gain.	Treat the first study as a permanent record — standards drift as the line changes.

6. Troubleshooting

Most issues trace back to one of a small number of causes. Work through this table before assuming something is broken.

Symptom	Likely Cause	Fix
New station row on the Index stays blank after saving.	Station tab name and Index entry don't match exactly.	Check spelling, spacing, and hyphenation on both the tab name and the Index cell — they must be identical characters.
Manpower shows as 1 for every station, even ones you know are different.	Present MP / Proposed MP cells were left blank on the Index sheet.	Fill in the actual manpower directly on the Index sheet — blank cells default silently rather than raising an error.
VSM Space value looks wrong compared to what you measured.	Value was entered into a station sheet's local Sq.ft² box instead of the Index sheet's m² field.	Enter Space in m² on the Index sheet directly; treat the station-sheet box as a reference note only.
A motion-verb question wasn't generated for an element you expected.	Description doesn't lead with the verb, or the verb is buried mid-sentence.	Rewrite the element description verb-first: "Insert the PCB," not "PCB is inserted by operator."
Generated questions keep saying "the part" instead of the real component name.	Component isn't listed in the Parts list yet.	Add the missing part name (and any common aliases) to the Parts list and re-run.
Yamazumi bars look disproportionate against what you measured.	Time units were mixed across stations (seconds vs. minutes).	Standardize every station's time entries to the same unit and re-run.
Two reports (e.g. MTM report and C2C report) tell slightly different stories about the same element.	Each report evaluates the element from a different lens (motion mechanics vs. variation/standardization) — this is expected, not a conflict to resolve.	Read both as complementary evidence, not competing conclusions; the Priority Engine reconciles them into one ranked action.
Study output looks unchanged after editing element descriptions.	Workbook wasn't saved before the study was re-run, or the report generator was pointed at an old export.	Save the workbook, confirm you're running the generator against the latest file, then re-run.

7. How to Read the Outcomes

A single study produces several linked outputs. They are meant to be read together, not in isolation — each answers a different question about the same station.

7.1 Index / VSM Summary

Start here. This gives you cycle time, manpower, bottleneck flag, and line balance efficiency (LBE%) at a glance. The bottleneck flag identifies whichever station has the highest cycle time on the line — that station sets the pace for everything downstream of it, so it's usually the first place to focus improvement effort.

7.2 Yamazumi & Line Balance Chart

This stacked chart shows each station's cycle time broken into value-added and non-value-added time, side by side against Takt Time. A station whose bar sits above the takt line is a bottleneck; a station well below it has slack that could absorb work from a neighboring station. Read this chart left to right as a balancing exercise, not just a time report.

7.3 Engineering Review Board (ERB) Findings

For every element, the system generates a Primary and Secondary question in the ECRS spirit (Eliminate, Combine, Rearrange, Simplify) — for example, asking whether a manual insertion could be automated, and what specific engineering control would remove the need for it. Read the Primary question as "why does this exist," and the Secondary as "what would remove it." The Eliminate / Alternate / Engineering Control / Training columns alongside each question are the starting menu of responses, not a prescription — the cross-functional team still decides.

7.4 Motion Waste (MTM) and Variation (C2C) Reports

These two reports look at the same elements through different lenses. The MTM report asks Golden Zone questions — reach, posture, vision, grasp, fixture — to surface motion waste. The C2C report looks at cycle-to-cycle variation above a threshold and asks standardization questions — is there an SOP, is it followed, what's causing the spread. It's normal, not a contradiction, for the two reports to highlight different things about the same station; together they cover motion efficiency and process stability separately.

7.5 Priority Engine

The Priority Engine takes every finding from the reports above and ranks them by impact and effort, producing one ordered action list. This is the list to open first in an implementation meeting — it exists specifically so the team isn't re-triaging six separate documents to decide where to start.

8. How to Make Use of It — The Working Loop

GLC IEDSS is built around a repeating loop, not a one-time report. Treat each study as one turn of the loop, not a finished document to file away.

1. Capture — Run the guided study at the station(s) in scope, writing elemental descriptions verb-first as you go.
2. Generate — Save the workbook and run the report generator to produce the full output set.
3. Review — Walk through the Priority Engine's ranked list as a cross-functional team; confirm or challenge each finding's process ownership.
4. Implement — Action the top items; log what was actually done against each finding.

5. Re-study — Once a change is live, re-run the study at that station to confirm the gain and reset the baseline for the next cycle.

The value compounds the more consistently this loop is followed. A single study is a snapshot; a station studied every quarter builds a running record that shows whether standard work is actually holding, not just whether it was written down once.

9. Scope and Disclaimers

9.1 What the System Does

GLC IEDSS captures a structured production study and generates the standard IE documentation set — VSM, Yamazumi, standard work, ERB findings, motion and variation analysis, and a ranked priority list — from that one source, cross-linked and consistent.

9.2 What the System Does Not Do

- It does not replace engineering judgment. Every generated question and ranked finding is a structured starting point for a decision the team still makes — not an automatic instruction.
- It does not verify measurements taken on the floor. Cycle times, distances, and counts are only as accurate as what was physically measured and typed in.
- It is not connected to, and does not replace, your ERP, PLM, or HR systems. It is a standalone engineering analysis tool with clear boundaries around what it covers.
- It does not make safety, quality, or compliance determinations. Findings related to those areas should always be verified against your plant's own safety and quality procedures before action is taken.

9.3 Data Dependency

Every output in this manual's Section 7 depends directly on data quality. A study built on vague elemental descriptions, mismatched units, or blank manpower fields will produce technically valid but practically weak output. Sections 3 through 5 of this manual exist specifically to protect against that.

9.4 Deployment and Licensing

GLC IEDSS runs on a perpetual license, hardware-locked to a single computer, and operates without an internet connection for normal use. There are no recurring subscription fees. Contact Gayathri Lean Consultancy for licensing transfers, additional seats, or version updates.

9.5 Disclaimer

> **Please note**
> This manual and the GLC IEDSS system are provided as engineering decision-support tools. Gayathri Lean Consultancy does not warrant specific productivity, cost, or safety outcomes from their use — results depend on data accuracy, correct implementation of findings, and sound engineering judgment applied by the user's own team. This manual is intended for internal use by the licensed organization and its authorized personnel.

For questions on anything in this manual, or to report a data-entry pattern that consistently produces confusing output, contact Gayathri Lean Consultancy directly.