THE LEVANTAR PROCESS-ORDER FRAMEWORK - *Operating Models for Manufacturers*

PROCESS TYPE	ONE-OFF	SPORADIC	PERIODIC	FREQUENT	CONTINUOUS
SINGLE-STAGE MANUFACTURING *One operation, one machine, one stage, then ship. A CNC machine milling parts. A press stamping components. A printer running labels. A single injection moulding machine.*	**ETO/MTO.** One-off job on a single machine or process.	**MTO.** Small infrequent batches to order.	**MTO/MTS.** Regular batch runs. Changeovers between products.	**MTS.** Regular runs replenishing stock. Changeover reduction key.	**MTS.** Dedicated machine. Single product. Minimal stops.
SEQUENTIAL PRODUCTION LINE *Multiple stages in a fixed sequence, appearing to run at one speed BUT running at different speeds. Buffers between the stages. A bottling line: blowing, cleaning, filling, capping, labelling, coding, packing. Also food production, packaging lines, filling lines.*	**MTO.** One-time run or trial/test batch through a standard line. Process is shared — may migrate right as demand builds.	**MTO.** Pilot or test product on an existing line. Low volume, proving the product or process.	**MTO/MTS.** Regular batches with planned changeovers. Where most sequential lines actually operate. Changeover capability is the master lever.	**MTS.** High-frequency runs. Changeovers still happen — flavour to flavour, size to size. May make more than needed and hold surplus.	**MTS.** Dedicated line. Single product. No changeovers. Buffers between stages still exist but reach steady state.
PARALLEL ASSEMBLY LINE *Balanced assembly stations at the same cycle time. Sub-components converge into a finished product. No WIP between stations. Think automotive assembly, white goods, electronics assembly.*	**ATO.** Sub-components to stock. Final assembly triggered by customer order and configured to spec. Often fed by batch production elsewhere.	**ATO.** Same product family, varying configurations and quantities ordered infrequently.	**ATO.** Regular orders. Level scheduling (Heijunka) becomes essential. Some fast-moving configurations may drift to MTS.	**ATO/MTS.** High-volume mixed-model assembly. Pull replenishment for sub-components. Supplier integration critical.	— *Rare. At this point the line has become a dedicated production line, not a flexible assembly operation.*
MULTI-STAGE HYBRID OPERATION *Multiple distinct stages with fundamentally different process times, skills, and equipment. Linked by BoM sequence, not buffers. The bottleneck is hiding BUT stable. Steel fabrications, bespoke joinery, control panels and made to order equipment — anyone who thinks "we're bespoke."*	**ETO.** Engineered product, project-planned. The order is bespoke — the processes are repeat. Design and engineering are part of the scope.	**ATO/MTO.** Product has been made before, design exists, routing is known. Not a one-off but often treated as one. This is where many businesses in this row actually sit.	**ATO/MTO.** Regular orders for known products. Capacity planning around the constraint becomes possible and essential.	**ATO/MTS.** Standard product range configured to order. Process standardisation across stages is now non-negotiable.	— *Not viable. The fundamental imbalance between stage processing times prevents continuous flow.*
CONTINUOUS FLOW *Material transforms continuously without discrete units. Chemicals, oil refining, glass, paper, cement, food ingredients, water treatment.*	— *Not viable. Process economics require sustained throughput to justify start-up and running costs.*	— *Not viable. Same reason.*	**MTS.** Campaign or batch runs in defined quantities. Grade or recipe changes between campaigns.	**MTS.** Semi-continuous. Planned interruptions for grade changes or maintenance windows.	**MTS.** Runs 24/7 or near-continuously. Output is rate-driven. Uptime and yield are everything.

Reading the framework: Find your process structure (rows) and your order frequency (columns). The cell describes the operating mode that fits that intersection. Empty cells are combinations that don't work in practice — understanding why is as valuable as understanding the positions that do.

The key insight: Order frequency and process structure are independent dimensions. A business can have bespoke orders and repeat processes. The order book describes the demand. The process structure describes the capability. They don't have to match**. Key - MTO -Make to Order, ATO – Assemble to Order, MTS – Make to Stock, ETO – Engineer to Order**

Based on and extending the Hayes-Wheelwright Product-Process Matrix (1979) and the Customer Order Decoupling Point literature.