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Part A

Task1

ISE 318 CASE STUDY 3 ATTACHMENT 1

OTIS FLOWCHART

Present/Proposed Method	Sheet No. of
Job Description: Packing department of a Retail Department Store	
Chart Begins: Packer checks goods with Advice Note (AN) on the packing bench	
Chart Ends: Selects next item for packing	
Suggestions:	

Summary	Present		Proposed		Difference	
	No.	Time	No.	Time	No.	Time
○						
□						
⇦						
D						
▽						
Totals						
Distance						

OTIS Process Chart - Material / Operative Flow

Description	Quality	Time	Distance	Operation / Inspection / Transportation / Delay / Storage/Hold	ASPECT ✗(isn't) ✓(something may need to improve) K. Is it necessary? L. Is it done in the best place? M. Is it done in the best sequence? N. Is it done by the best person? O. Is it done in the best way?
Packer checks goods with Advice Note (AN) on the packing bench				○ □ ⇦ D ▽	✓ k ✓ L ✓ M ✓ N ✓ O
Takes AN to chargehand's desk				○ □ ⇦ D ▽	✓ k ✗ L ✓ M ✓ N ✗ O
Collects Delivery Note (DN) from Chargehand				○ □ ⇦ D ▽	✓ k ✓ L ✓ M ✓ N ✓ O
Returns to packing bench with DN				○ □ ⇦ D ▽	✓ k ✗ L ✓ M ✓ N ✗ O
Matches goods, AN, DN and pre-printed Label (PPL)				○ □ ⇦ D ▽	✓ k ✓ L ✓ M ✓ N ✓ O
Goes to roll of corrugated papper, cuts suitable length				○ □ ⇦ D ▽	✓ k ✓ L ✓ M ✓ N ✓ O
Returns to packing bench				○ □ ⇦ D ▽	✓ k ✗ L ✓ M ✓ N ✗ O
Goes to carton rack, selects carton				○ □ ⇦ D ▽	✓ k ✗ L ✓ M ✓ N ✗ O
Returns to bench, makes up carton				○ □ ⇦ D ▽	✓ k ✗ L ✓ M ✓ N ✗ O
Wraps goods in corrugated paper				○ □ ⇦ D ▽	✓ k ✓ L ✓ M ✓ N ✗ O

Packs goods into carton				○ □ ⇦ D ▽	K ✓ L ✓ M ✓ N ✓ O ✗
Wraps carton in brown paper				○ □ ⇦ D ▽	K ✓ L ✓ M ✓ N ✓ O ✗
Attaches Delivery Note, label, and ties with string				○ □ ⇦ D ▽	K ✓ L ✓ M ✓ N ✓ O ✗
Takes parcel to weighing machine				○ □ ⇦ D ▽	K ✓ L ✗ M ✓ N ✓ O ✗
Weighs parcel and records weight on AN				○ □ ⇦ D ▽	K ✓ L ✓ M ✓ N ✓ O ✗
Moves parcel in delivery area				○ □ ⇦ D ▽	K ✓ L ✓ M ✓ N ✓ O ✗
Deposits parcel in Delivery area				○ □ ⇦ D ▽	K ✓ L ✓ M ✓ N ✓ O ✓
Returns to bench, picks up AN				○ □ ⇦ D ▽	K ✓ L ✗ M ✓ N ✓ O ✗
Takes AN to chargehand and files it				○ □ ⇦ D ▽	K ✓ L ✗ M ✓ N ✗ O ✓
Select next item for packing				○ □ ⇦ D ▽	K ✓ L ✓ M ✓ N ✓ O ✓
				○ □ ⇦ D ▽	
				○ □ ⇦ D ▽	
				○ □ ⇦ D ▽	
				○ □ ⇦ D ▽	
				○ □ ⇦ D ▽	
				○ □ ⇦ D ▽	
				○ □ ⇦ D ▽	
				○ □ ⇦ D ▽	
				○ □ ⇦ D ▽	
				○ □ ⇦ D ▽	
				○ □ ⇦ D ▽	
				○ □ ⇦ D ▽	

Task 2

Recommendations to improve the existing packing procedure

In the existing packing process, there are greatly identifiable inefficiencies from the cumbersome design and the step-by-step processing workflow, there appear to be unnecessary travels and activities.

The first recommendation would be the installation of a fully integrated and ergonomically designed packing workstation. All relevant materials, such as the corrugated paper dispenser, a selection of cartons, and the weighing balance, should be located within the reach of the workstation. The design of the workstation would aim to reduce the distance and stamina spent travelling to the packing and Chargehand's desk. The result would significantly simplify the working cycle, which also lowers the feeling of fatigue. These ideas reflect the core principles of industrial engineering, focusing on the reduction of Motion and the Lean principles.

Improvements such as automated documentations and batch processing of orders can facilitate multifunctional integration. The movement process of advice notes and delivery notes captured in ANs and DNs subsequently from the Chargehand’s desk to the bench and back signifies a major block in the process. Capturing ANs at the workstation and applying a packer DN to the same in a scanned, weight-recorded format can reduce movement and improve accuracy.

A digital processing system can be introduced to operate concurrently with the batch processing approach of multiple orders. Making both systems work effectively, lowering the time costs of administrative activities. Standardizing materials and reordering the sequence of operational steps are also crucial. The sizes of the corrugated papers should be set in advance; also, pre-processing on the brown papers, cartons, and the setup tools all at once at a workstation would greatly reduce repetitive tasks.

The steps in the packing process should be rearranged into a single, directional linear workflow to remove repeated steps and intermediate holding points that put the process on pause. With a designated and conveniently placed output zone for the finished parcels. All of these together would form a completed systematic workflow.

Task3

Present/Proposed Method	Sheet No. of
Job Description:	Processing a customer food order from entry to exit at McDonald's
Chart Begins:	Customer enters restaurant
Chart Ends:	Customer leaves restaurant
Suggestions:	

Summary

	Present		Proposed		Difference	
	No.	Time	No.	Time	No.	Time
○	6					
□	1					
⇦	2					
D	2	4-15 mins				
▽	0					
Totals						
Distance						

OTIS Process Chart - Material / Operative Flow

Description	Quality	Time	Distance	Operation Inspection Transportation Delay Storage/Hold	ASPECT K. Is it necessary? L. Is it done in the best place? M. Is it done in the best sequence? N. Is it done by the best person? O. Is it done in the best way?
Customer enters restaurant				○ □ ⇦ D ▽	K✓,L✓,M✓,N✓,O✓
Customer queues at counter		1-5 mins		○ □ ⇦ D ▽	K✓,L✓,M✓,N✓,OX
Customer places order with cashier				○ □ ⇦ D ▽	K✓,L✓,M✓,N✓,OX
Cashier inputs order into POS system				○ □ ⇦ D ▽	K✓,L✓,M✓,N✓,OX
Customer pays for the order				○ □ ⇦ D ▽	K✓,L✓,M✓,N✓,OX
Cashier gives receipt and order number				○ □ ⇦ D ▽	K✓,L✓,M✓,N✓,O✓
Customer waits for order to be prepared		3-10 mins		○ □ ⇦ D ▽	K✓,LX,M✓,N✓,OX
Staff prepares food				○ □ ⇦ D ▽	K✓,L✓,M✓,N✓,OX
Staff checks order for accuracy				○ □ ⇦ D ▽	K✓,L✓,M✓,N✓,OX
Staff calls order number				○ □ ⇦ D ▽	K✓,L✓,M✓,N✓,OX

Customer collects food				○	□	⇦	D	▽	K✓,L✓,M✓,N✓,O✓
Customer leaves restaurant				○	□	⇦	D	▽	K✓,L✓,M✓,N✓,O✓
				○	□	⇦	D	▽	
				○	□	⇦	D	▽	

Recommendations for Process Improvement

1. Reduce Queuing Time
   - Install Self-Order Kiosks:
     Allow customers to place orders themselves, reducing queue length and cashier workload.
   - Mobile Ordering:
     Enable customers to order and pay via a mobile app before arriving, so they can skip the queue.
2. Streamline Order Placement
   - Simplify Menu Display:
     Use digital menu boards with clear categories and images to help customers decide faster.
   - Multilingual Support:
     Ensure ordering systems and staff can assist in multiple languages for diverse customers.
3. Optimize Payment Process
   - Contactless Payment Options:
     Accept mobile payments (Apple Pay, Alipay, Octopus, etc.) to speed up transactions.
   - Integrated Payment at Kiosks:
     Allow payment directly at self-order kiosks.
4. Minimize Waiting Time for Food
   - Order Status Displays:
     Install screens showing order progress and estimated wait time, reducing customer anxiety and confusion.
   - Efficient Kitchen Workflow:
     Use kitchen display systems to prioritize and track orders, ensuring timely preparation.
5. Improve Order Accuracy

- Digital Checklists for Staff:
  Use electronic systems to verify each order before handing it to the customer.
- Double-Check Mechanism:
  Implement a quick visual or barcode check before food is handed out.

6. Enhance Food Collection Experience
   - Clear Pickup Counters:
     Designate and clearly mark pickup areas to avoid crowding and confusion.
   - Automated Notifications:
     Use digital screens or mobile notifications to alert customers when their order is ready.
7. Continuous Staff Training
   - Customer Service Training:
     Regularly train staff on efficient service, communication, and technology use.
   - Cross-Training:
     Enable staff to handle multiple roles during peak times for flexibility.
8. Layout and Space Optimization
   - Redesign Waiting Areas:
     Provide comfortable, spacious waiting zones with clear signage.
   - Optimize Counter Placement:
     Arrange counters and kiosks to maximize flow and minimize bottlenecks.
9. Feedback and Continuous Improvement
   - Customer Feedback Systems:
     Install quick feedback stations or digital surveys to gather suggestions and complaints.
   - Regular Process Review:
     Use flowcharts and data to periodically review and refine the process.

Process Flowchart Enables Service Process Improvement

First, the flowchart of the process will be made by outlining every action a customer goes through from the time they enter the restaurant until they leave with their food. Each one of the actions a customer takes; waiting in line, ordering, paying, waiting, and picking up their food is represented by symbols. A circle representation symbolizes action, arrows symbolize movement, squares symbolize inspection, triangles symbolize storage, and D represents delay. Overall, this representation provides a simple overview of the entire service process, thereby making it easier to recognize the flow of work and where delays actually occur.

Next, once the flowchart is completed, we can interpret it as a diagnostic tool to target issue areas. For example, the flowchart can visually demonstrate how long the customer was waiting in line to place their order and then how long they were waiting until they received their food. These delays will be marked by the flowchart so we have an area to work towards improvement. The flowchart will also highlight areas where movement or checking-off was unnecessary.

The next step will involve conducting an analysis of each element of the process relative to the ASPECT criteria: Is it necessary? Is it in the best location? Is it done in the best order? Is it done by the best person? Is it done in the best manner? For example, in looking at the process at McDonald's, managers may discover that queuing at the counter could be reduced or possibly eliminated with self-order kiosks. Furthermore, the area in the waiting section for collecting the order could also be scrutinized for flow and comfort.

The concept flowchart will inform the development of evidence-based recommendations. For example, by adding self-order kiosks, queue times can be reduced and employees can be assigned to other tasks. Digital order status displays can alleviate customer uncertainty by reducing perceived wait time. Digital checklists can improve speed and accuracy in the kitchen. Each recommendation can be reflected with a process flowchart, which will offer managers a comparison between the first flow and the new one while predicting the value of change.