TEXAS STATE
INGRAM SCHOOL OF ENGINEERING

I2.02 - Supply Chain Planning for Optimized Demand Fulfillment

Polímeros Ópticos™

Abdulrahman Jundi, Xaritzy Cadena, Karla Romano, Rogelio Berlanga

Background

Polimeros Opticos (PO), leaders in the distribution and marketing of optical products such as frames (ophthalmic lenses), contact lenses and accessories in Mexico

Problem statement

PO faces data inconsistencies across sources, causing delays in demand forecasting and higher costs due to manual processing
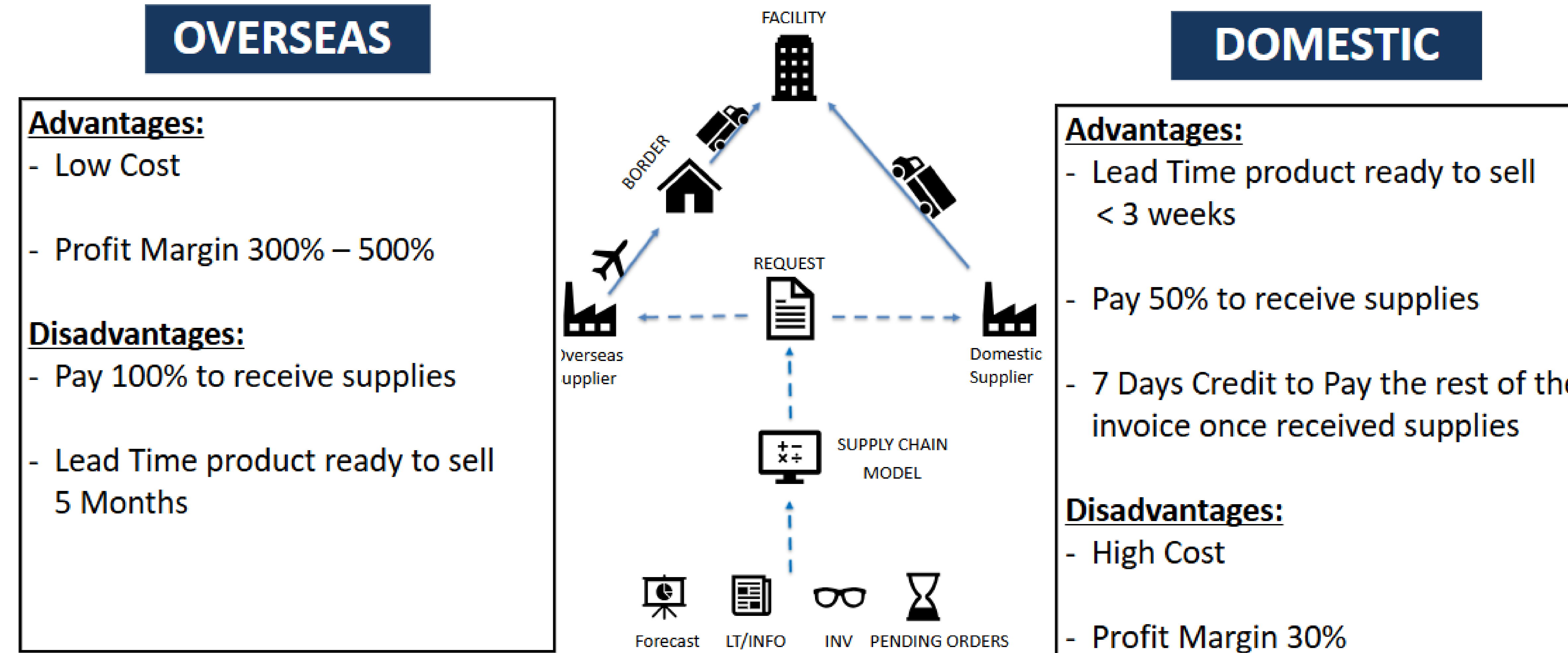
Project Objectives

1. Build Supply Chain Model
   Simulate the flow of goods, info, and finances to improve cost, efficiency, and delivery.
2. Create Scenario Platform
   Manage and analyze business scenarios to support decisions.
3. Define Monthly Planning
   Standardize planning to ensure consistency and strategic alignment.

Benefits

- Streamlined operations
- Better demand coverage
- Reduced costs and errors
- Enhanced decision-making
- Increased adaptability
- Faster user onboarding

Supply Chain Model

OVERSEAS

Advantages:
- Low Cost
- Profit Margin 300% – 500%

Disadvantages:
- Pay 100% to receive supplies
- Lead Time product ready to sell 5 Months

DOMESTIC

Advantages:
- Lead Time product ready to sell < 3 weeks
- Pay 50% to receive supplies
- 7 Days Credit to Pay the rest of the invoice once received supplies

Disadvantages:
- High Cost
- Profit Margin 30%

FACILITY
BORDER
REQUEST
Overseas Supplier
Domestic Supplier
SUPPLY CHAIN MODEL
Forecast | LT/INFO | INV | PENDING ORDERS

Model & Dashboard Results

TypeofDemand: Normal, Optimistic, Pesimistic

Brand: ANIMA, AXESS EYEWEAR, AXESS KIDS, AXESSCLIP, AXESSONE, BANDERAS, BRAVO, LIBERTY SPORT, NANO VISTA, STEPPER

Demand & Sales Analysis

Period	Demand	Sales	Coverage	Income	Outcome	Profit
2025-01	2,385	-	0%	$0	($312,375)	($312,375)
2025-02	2,370	2,370	100%	$333,459	$0	$333,459
2025-03	2,358	-	0%	$0	($330,750)	($330,750)
2025-04	2,359	-	0%	$0	($322,875)	($322,875)
2025-05	2,351	2,351	100%	$335,723	($312,375)	$23,348
2025-06	2,353	-	0%	$0	($330,790)	($330,790)
2025-07	2,355	2,355	100%	$333,821	$0	$3,071
2025-08	2,364	2,364	100%	$330,133	($322,915)	$7,218
2025-09	2,368	2,368	100%	$315,773	($40)	$315,733
2025-10	2,358	2,358	100%	$354,054	($330,750)	$23,304
2025-11	2,354	2,354	100%	$338,623	($40)	$338,583
2025-12	2,351	2,351	100%	$491,241	$0	$491,241
2026-01	2,361	-	0%	$0	($321,300)	($321,300)
2026-02	2,360	2,360	100%	$341,539	$0	$341,539
2026-03	2,360	2,360	100%	$321,149	$0	$321,149
2026-04	2,360	-	0%	$0	($217,393)	($217,393)
2026-05	2,360	2,360	100%	$346,637	($321,300)	$25,337
2026-06	2,361	2,361	100%	$321,285	($40)	$321,245
2026-07	2,361	2,361	100%	$344,234	$0	$344,234
2026-08	2,361	2,361	100%	$339,134	($217,393)	$121,741
2026-09	2,361	2,361	100%	$323,835	($26)	$323,809
2026-10	2,361	2,361	100%	$364,633	$0	$364,633
2026-11	2,361	2,361	100%	$349,334	$0	$349,334
2026-12	2,362	2,362	100%	$507,641	$0	$507,641
Total	56,655	42,479	75%	$6,392,246	($3,671,112)	$2,721,135

Demand Coverage
Finance Analysis (Income, Outcome, Profit)
Brand Cashflow Analysis - Normal ($4,567,338 AXESS EYEWEAR Normal Income; $5,462,344 AXESS EYEWEAR Normal Outcome)
Brand Coverage Analysis - AXESS EYEWEAR (35,598 AXESS EYEWEAR Normal Sales; 56,655 AXESS EYEWEAR Normal Demand)

$$\text{Max} \quad \sum_{\substack{i \in B \\ t \in T}} Profit_{i,t} \qquad \text{(1) Maximize Profit}$$

subject to

$$Profit_{i,t} == Incomes_{i,t} - OverseasOutcomes_{i,t} - DomesticOutcomes_{i,t} \quad \text{(2) Profit}$$
$$Incomes_{i,t} == SP_{i,t} \cdot Sales_{i,t} \quad \text{(3) Incomes}$$
$$OverseasOutcomes_{i,t} == (PC_{i,t} + TCSB_{i,t} + IC_{i,t} + TSBF_{i,t}) \cdot OverseasOrder_{i,t} \quad \text{(4) Overseas Outcomes}$$
$$DomesticOutcomes_{i,t} == PCL_{i,t} \cdot DomesticOrder_{i,t} \quad \text{(5) Domestic Outcomes}$$
$$Sales_{i,t} <= FN_{i,t} \quad \text{(6) Sales must be less than equal to the Demand}$$
$$Inv_{i,t-1} + PO_{i,t} + Order_{i,t} - Sales_{i,t} <= Inv_{i,t} \quad \text{(7) Inventory Balance considering Lead Times}$$
$$Order_{i,t} <= 2500 \quad \text{(8) Order less than 2,500 units per Brand per period}$$
$$DomesticOutcomes_{i,t} + OverseasOutcomes_{i,t} <= OutcomesLimit_{i,t} \quad \text{(9) Overseas Outcome Limit per Brand per period}$$
$$DomesticOutcomes_{i,t} <= DomesticOutcomesLimit_{i,t} \quad \text{(10) Domestic Outcome Limit per Brand per period}$$
$$OverseasOutcomes_{i,t} <= OverseasOutcomesLimit_{i,t} \quad \text{(11) Total Outcome Limit per Brand per period}$$
$$Inv_{i,t} >= FN_{i,t} * 1.5 \quad \text{(12) Keep 90 dias of Inventory per Brand per period}$$
$$Inv_{i,t}, Order_{i,t}, Sales_{i,t} \geq 0 \quad \text{(13) Non Negative Decision Variables}$$

Human Factors

- Reduce mental workload of key personnel
- Clear Reporting and Visualization
- Adaptability of Scenarios and Flexibility of Model
- Training and Decision Support
- Make better decisions according to business plan

Future Plans

- Scenario Management & Testing
- Validate results
- Define new reports
- Go to production

Environmental

- Reduce transportation cost
- Donating unused frames to women shelters

Team Members

Abdulrahman, Xaritzy, Karla, Rogelio
Sponsor: Gerardo Cortes   Faculty: Dr.Trevino