

Improving Fleet Utilization - A Comprehensive Analysis With Solutions For Shipment Brokerage Market Entry

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BUSINESS PROBLEM FRAMING

- A major problem in truck transportation: Deadhead mile
- Fleet utilization optimization is crucial to solving the problem of deadhead miles, and calculate the profit generated by them
- Conduct marketing analysis to determine whether to buy or build a brokerage company
- By improving fleet utilization and exploring the feasibility of building a brokerage company, our client can reduce deadhead miles and generate profits

DEADHEAD

- Deadhead miles are the number of miles that truckers drive without any cargo on their return trip
- For company, deadhead mile results in loss of profits and generates fuel and maintenance costs for companies
- For truckers, driving without cargo is dangerous
- For environmental, deadhead miles increase exhaust emissions and contribute to road destruction

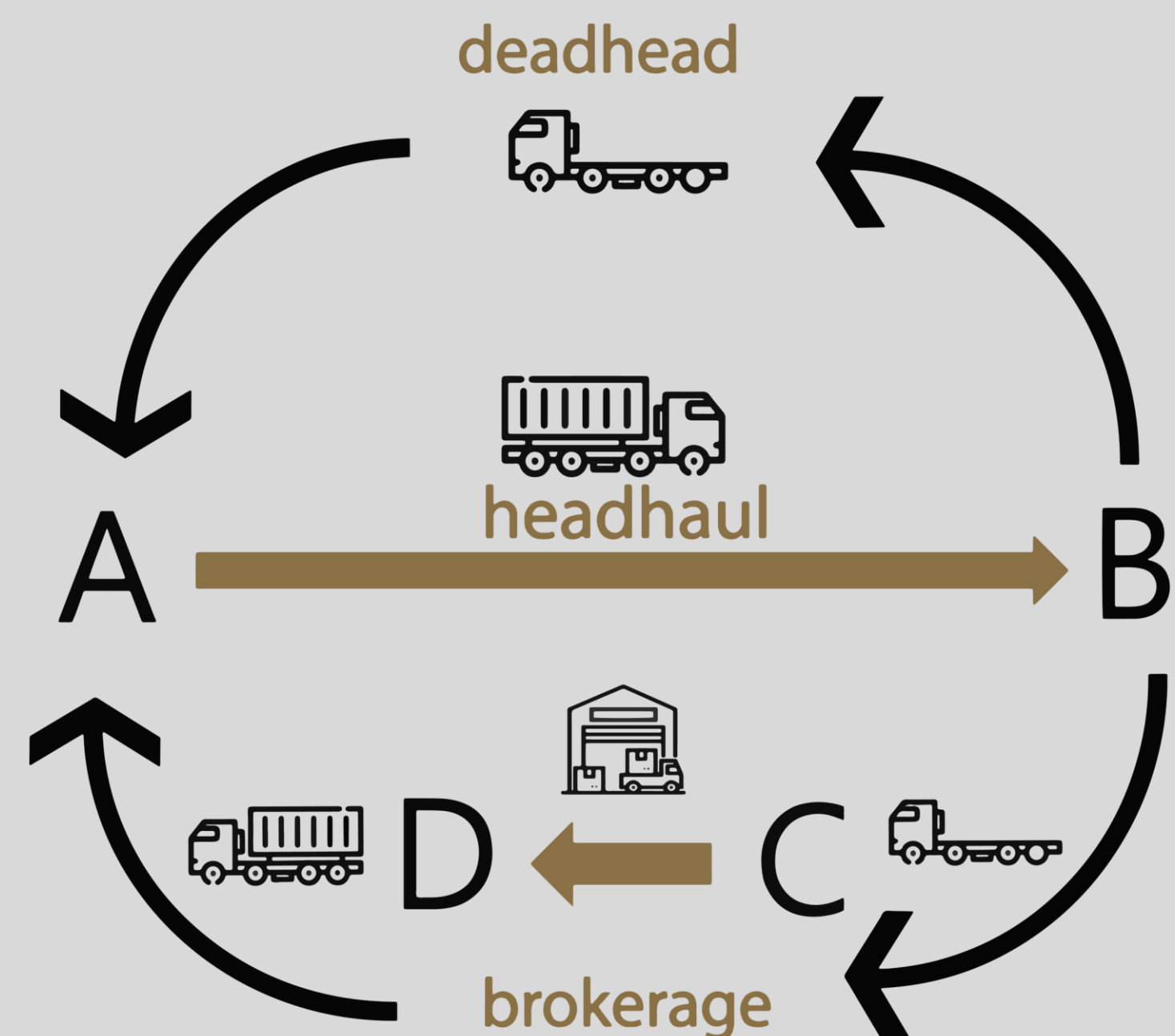


Fig 1. Deadhead explanation



ANALYTICS PROBLEM FRAMING

- Deadhead calculation approach:**
 - Take the difference between trips on lane (A->B) and reverse lane (B->A) to find volume of deadheads (V)
- Assumptions:**
 - All trips made to a location have a return trip to the origin
 - Carriers don't have both nodes as origins
- Calculation of the opportunity generated by the reduction of deadhead miles with Naive Model:**

$$\text{Opportunity} = \alpha * ((R * D * V) - (V * D * M * F)) = \$9,000,000$$

Lane	Miles	Fuel	#Deadhead	Demand	Revenue	Safety Factor
	M	F	V	D	R	$\alpha=0.7$

BETWEENNESS OF LOCATIONS

- Comparing overall network:** The size of the warehouses denotes the betweenness of locations. Greenfield has the highest incoming and outgoing deadheads, followed by Monmouth, Tar Heel, Kansas, Junction City, Cudahy, and Crete.

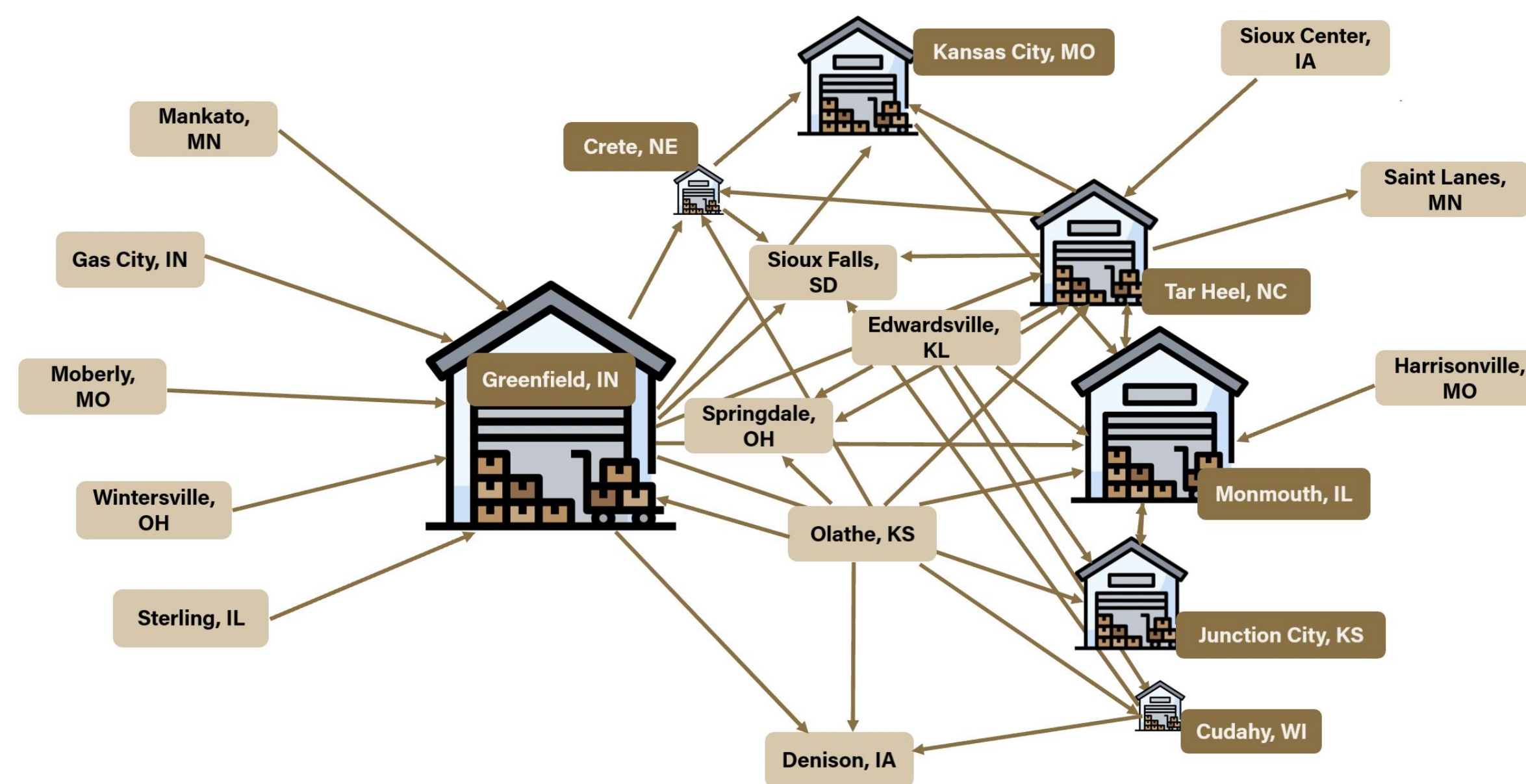


Fig 2. Betweenness of locations



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METHODOLOGY

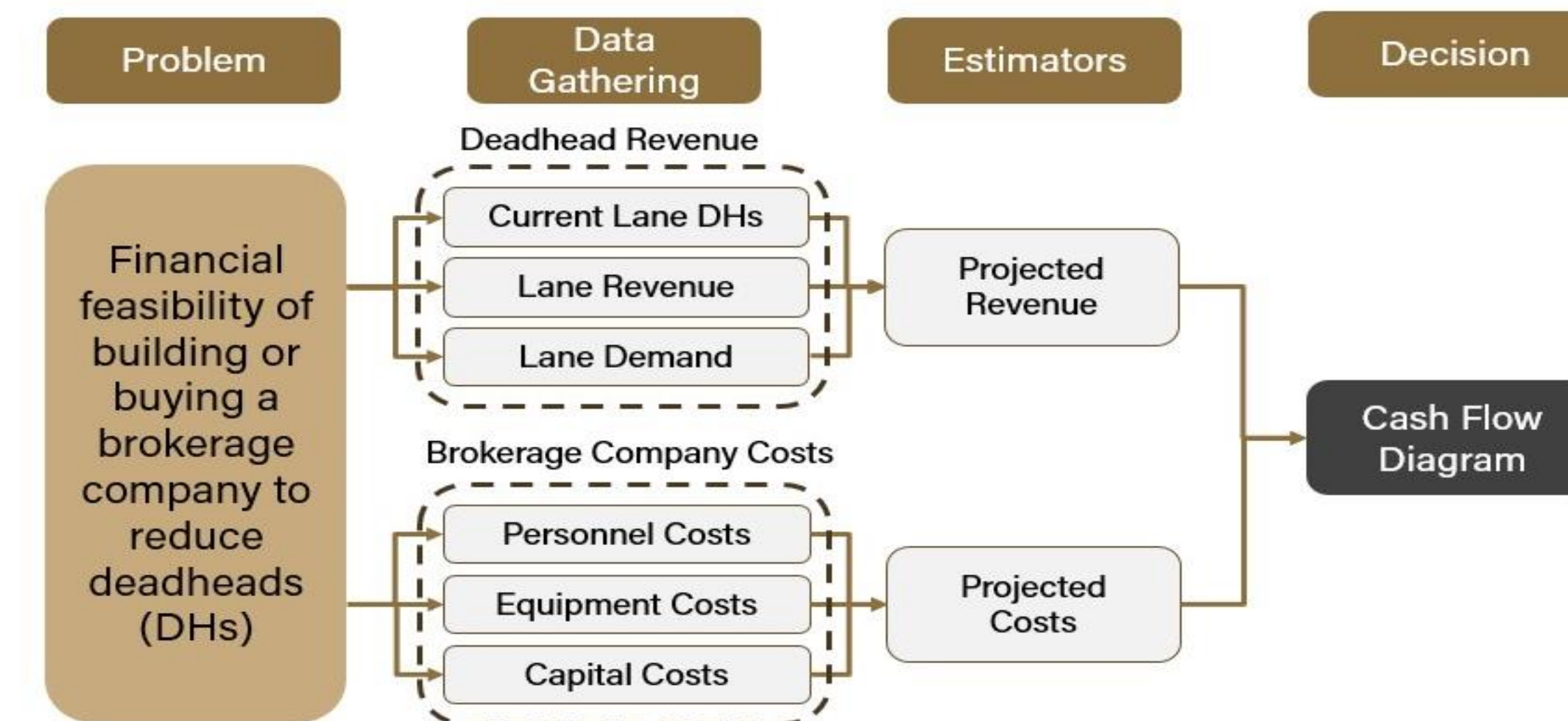


Fig 3. Methodology

- Step 1: Identify all the deadheads
- Step 2: Calculate the profit generated by the deadheads
- Step 3: Based on the profit, conduct market analysis and calculate the possible costs of building or buying a brokerage company
- Step 4: Provide complete information for our client to help them in decision making

DATA

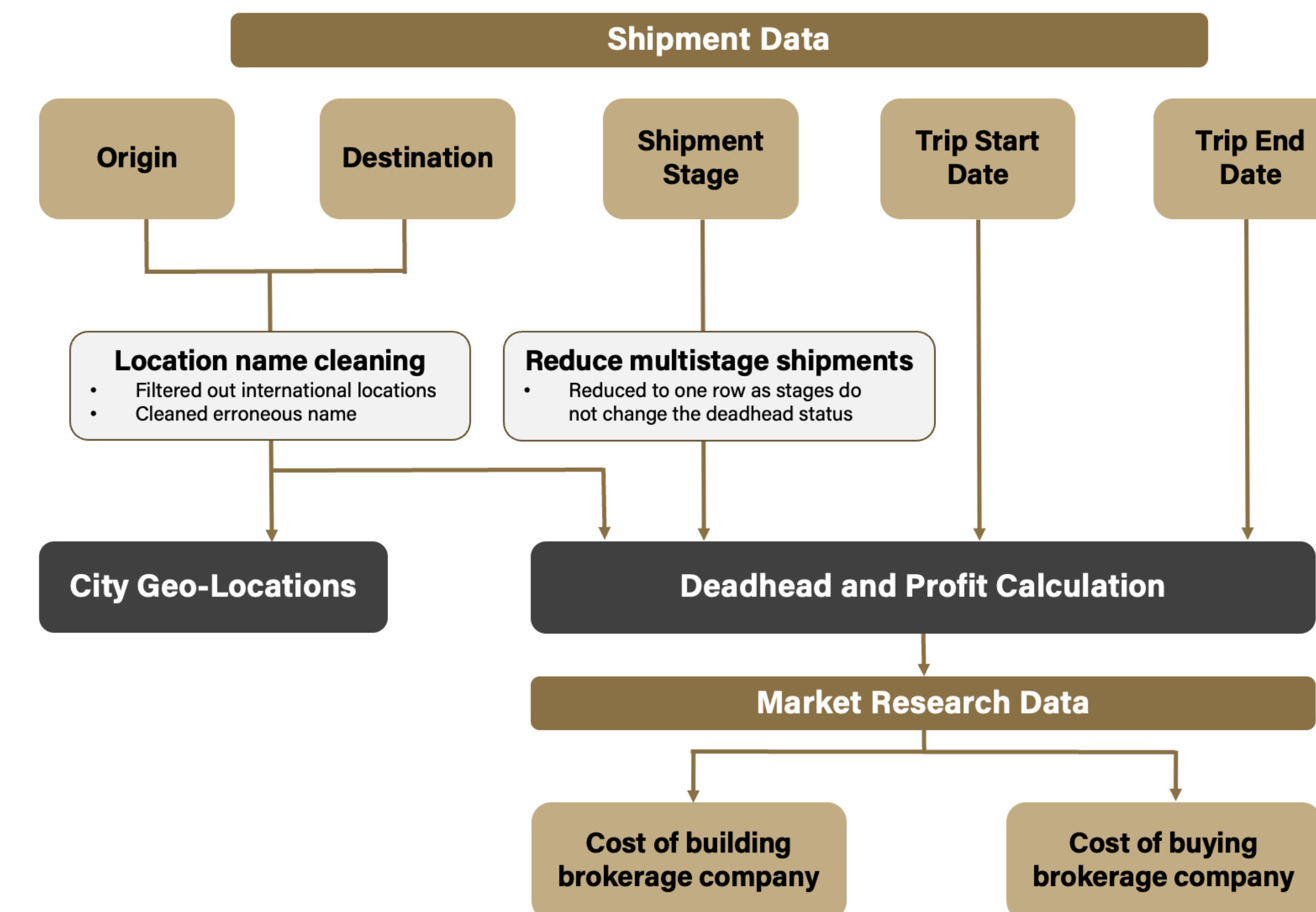


Fig 4. Data

ESTABLISHMENT OF BROKERAGE COMPANY

- Operating cost for building a brokerage company
- Suggested organization structure for the brokerage company

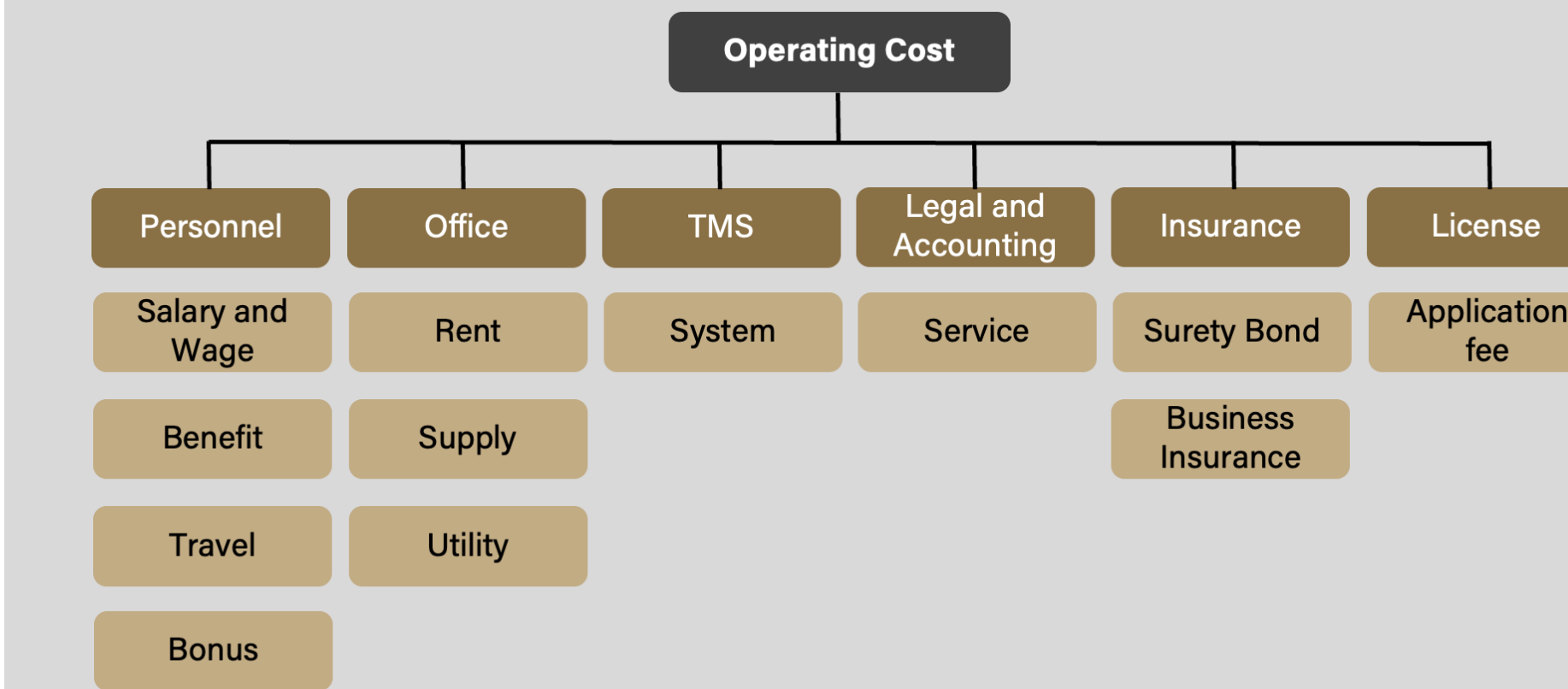


Fig 6. Brokerage company cost structure

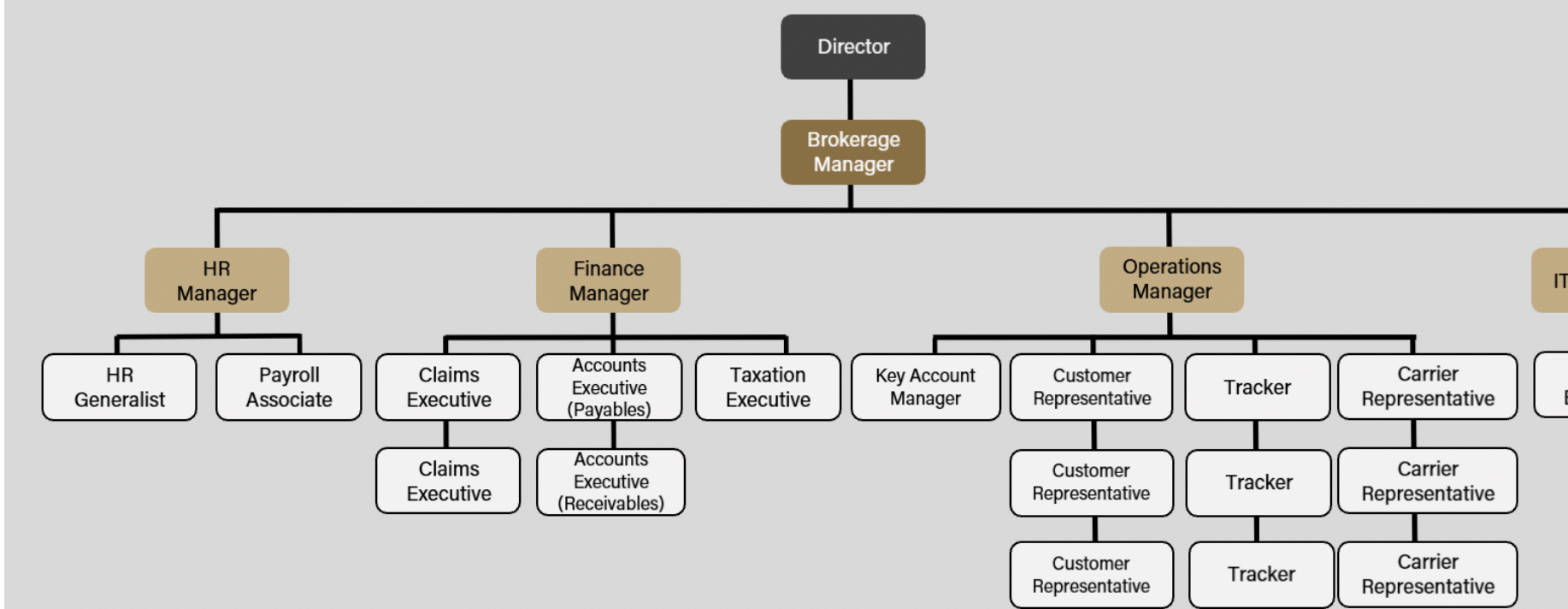


Fig 7. Brokerage company organization structure

BREAKEVEN ANALYSIS

- With 12.34% of Return on Investment, the brokerage firm will be breaking even at the end of the 3rd year.

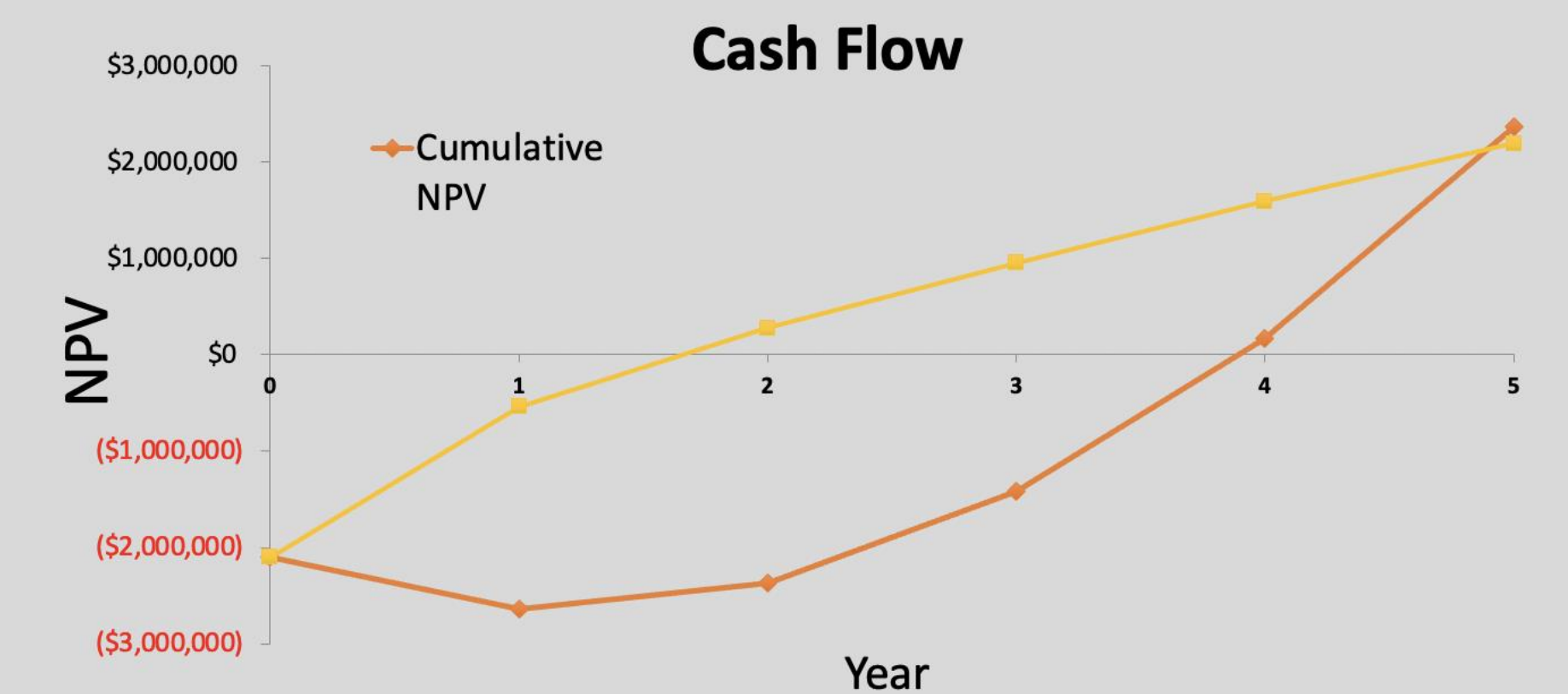


Fig 8. Cash flow diagram

ACKNOWLEDGEMENTS

We would like to thank our industry partner for their guidance and support on this project as well as the Purdue MS BAIM program for partially funding this work.

